The 4th TARC INTERNATIONAL CONFERENCE ON LEARNING AND TEACHING

Empowering 21st Century Learners Through Holistic and Enterprising Learning

17 – 18 October, 2016
Tunku Abdul Rahman University College, Kuala Lumpur, Malaysia
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Johor Branch
  Dr Fong Cheng Weng
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Associate Professor, School of Cultural and Professional Learning, Faculty of Education, Queensland University of Technology, Brisbane, QLD.

Dr Gavin Sanderson  
Senior Lecturer, Learning and Teaching Unit, Teaching & Learning Services, City West Campus, University of South Australia, Australia

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Professor, Robert Gordon University

Prof Christopher O’Neil  
Professor, Robert Gordon University

Dr Christine McDonald  
Science educator in the School of Education and Professional Studies, and Griffith Institute for Educational Research at Griffith University

Prof Parlo Singh  
Research Professor, Griffith University for Education Research

Dr Ralf Burbach  
Assistant Head of School of Hospitality Management and Tourism, Dublin Institute of Technology

Dr Tina Bass  
Deputy Head of Strategy and Applied Management, Faculty of Business, Environment and Society, Coventry University

Dr Panagiotis Andrikopoulos  
Associate Head of Economics, Finance and Accounting (Applied Research), Coventry University

Dr Gearóid Ó Súilleabháin  
Head of Department of Technology Enhanced Learning, Cork Institute of Technology

Dr Breda Kenny  
Head of Hincks Centre for Entrepreneurship Excellence, Cork Institute of Technology

Dr Stephen Cassidy  
Dean of Academic Quality Enhancement and Acting Dean of Graduate Studies, Cork Institute of Technology

Dr Neil Mitchell  
Senior Lecturer, School of Electronics, Electrical Engineering and Computer Science Queens University of Belfast

Prof Maricar S. Prudente  
Professor, De La Salle University, Philippine

Dr Christine C.M Goh  
Professor, Dean, Graduate Studies & Professional Learning, NIE/NTU, Nanyang Technological University, Singapore

Prof Prithwi Raj Subramaniam  
Professor, Department of Health Promotion and Physical Education, Ithaca College, New York, US

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Assistant Professor, Faculty of Urbanism, "Ion Mincu" University of Architecture and Urbanism, Bucharest, Romania

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Assistant Professor of Education, Campbell University

Dr Boris Abbey  
Lundy Chair of the Philosophy of Business, Lundy-Fetterman School of Education, Campbell University

Dr Yen-Ping Kuo  
Chair and Professor of Microbiology & Immunology, Assistant Dean of Curriculum, Jerry M. Wallace School of Osteopathic Medicine, Campbell University
### NATIONAL PANEL OF PEER REVIEWERS

<table>
<thead>
<tr>
<th>Name</th>
<th>Position and Affiliation</th>
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<tr>
<td>Assoc Prof Dr Nor Azmi Bin Mostafa</td>
<td>Associate Professor, Faculty of Languages and Communication, Universiti Pendidikan Sultan Idris, Perak</td>
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<tr>
<td>Assoc Prof Dr Raja Nor Safinas Binti Raja Harun</td>
<td>Associate Professor, Faculty of Languages and Communication, Universiti Pendidikan Sultan Idris, Perak</td>
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<td>Prof Dr Gurnam Kaur A/P Gurdial Singh</td>
<td>Professor, Faculty of Education, Universiti Teknologi MARA, Malaysia</td>
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<td>Assoc Prof Dr Pauline Goh Swee Choo</td>
<td>Associate Professor, Faculty of Education and Human Development, Universiti Pendidikan Sultan Idris, Perak</td>
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<tr>
<td>Prof Dr Ewe Hong Tat</td>
<td>Professor, Vice President, Universiti Tunku Abdul Rahman</td>
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<tr>
<td>(the late) Assoc Prof Dr Teh Chee Seng @ Elvis Teh Chee Seng</td>
<td>Associate Professor, Vice President (Student Development &amp; Alumni Relations) Faculty of Arts &amp; Social Science, Universiti Tunku Abdul Rahman</td>
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<td>Dr Cheah Phaik Kin</td>
<td>Assistant Professor, Department of Public Relations, Faculty of Arts and Social Science, Universiti Tunku Abdul Rahman, Perak</td>
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<td>Dr Priscilla Moses</td>
<td>Assistant Professor, Deputy Dean (R&amp;D and Postgraduate Programme, Faculty of Arts and Social Science, Universiti Tunku Abdul Rahman</td>
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<tr>
<td>Ms Saraswathy Thurairaj</td>
<td>Lecturer, Faculty of Creative Industries, Universiti Tunku Abdul Rahman</td>
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<td>Dr Siew Pei Hwa</td>
<td>Assistant Professor, Faculty of Creative Industries, Universiti Tunku Abdul Rahman</td>
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<td>Dr Lee Jer Vui</td>
<td>Assistant Professor, Lee Kong Chian Faculty of Engineering &amp; Science, Universiti Tunku Abdul Rahman</td>
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<td>Mr Paul Ang Ban Hock</td>
<td>Senior Lecturer, Faculty of Creative Industries, Universiti Tunku Abdul Rahman</td>
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<td>Dr Suraini Binti Mohd Ali</td>
<td>Lecturer, Faculty of Major Languages Studies, Universiti Sains Islam Malaysia, Negeri Sembilan</td>
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<td>Dr Anushia Inthiran</td>
<td>Lecturer and Course Coordinator Master of Business Information Systems (MBiS) Monash University Malaysia</td>
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<td>Dr Noor Saazai Bt Mat Saad</td>
<td>Senior Lecturer, Faculty of Major Languages Studies, Universiti Sains Islam Malaysia, Negeri Sembilan, Malaysia</td>
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<td>Associate Professor, Faculty of Education, Universiti Teknologi MARA, Shah Alam, Malaysia</td>
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<td>Dr Malini A/P N G Ganapathy</td>
<td>Teacher DG 44, School of Languages, Literacies and Translation, Universiti Sains Malaysia, Penang</td>
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<td>Ms Chan Eang Teng</td>
<td>Faculty of Social Science, Arts and Humanities, Tunku Abdul Rahman University College</td>
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PREFACE BY CHAIR OF EDITORIAL

This year the TARC International Conference 2016 (TIC2016) will again be held at the Tunku Abdul Rahman University College Main Campus in Kuala Lumpur. We are very pleased to introduce the proceedings of the Fourth International Conference on Learning and Teaching with the theme of “Empowering 21st Century Learners Through Holistic and Enterprising Learning”. The level of interest in the subject matter of the conference is maintained with over 70 suitable papers selected for presentation at the conference and delegates participation from over 14 countries.

The papers selected cover the three main subthemes of the Conference: Globalised Online Learning, Methodologies and Strategies for Holistic and Enterprising Learning, and Curriculum Enhancement and Pedagogical Models. The programme is organised into 4-5 parallel sessions with the above mentioned themes, with each paper or workshop given sufficient time for presentation and to accommodate all of them within the overall planned schedule.

We would like to thank the international and national reviewers for their contributions in reviewing the papers selected for this conference. We would like to acknowledge the authors themselves without whose expert input there would not be a conference. Hence, this proceedings serves as a permanent record on what are presented at the conference.

We would like to thank the Organizing Committee chaired by Dr Pou San Oo and the Editorial Committee Members for their contribution in organising and planning the conference.

We also would like to acknowledge the important contributions of the team led by Mr Richard Liau and Dr Chit Hwa Kwang in assembling the conference proceedings. The continuing success of this conference series means that the Fifth International Conference on Teaching and Learning to be held in 2019 can now be planned confidently and we hope to see you again in TIC2019.

We hope you will enjoy the TIC2016 Conference and find new ideas to continuously empower your students through enhanced teaching skills.

Last, but not the least, we would like to acknowledge the sponsors and partner universities whose contributions have made this conference a success.

Assoc Prof Dr Geok Bee Teh
Editorial Committee, Chair

Dr Mui Joo Tang
Editorial Committee, Co-Chair

TARC INTERNATIONAL CONFERENCE 2016 ON LEARNING AND TEACHING
# Programme

## Monday, 17 October 2016

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<td>8.30 – 9.15 a.m.</td>
<td>Registration</td>
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<tr>
<td>9.15 – 9.30 a.m.</td>
<td><strong>Welcome Address</strong></td>
<td>Yg Bhg Datuk Dr Tan Chik Heok</td>
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<td>President, Tunku Abdul Rahman University College</td>
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<tr>
<td>9.30 – 10.00 a.m.</td>
<td><strong>Keynote Address &amp; Official Opening</strong></td>
<td>Yg Bhg Datuk Prof Dr Roziah Omar</td>
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<td>Deputy Director General of Higher Education</td>
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<td>Private Higher Education Institutions (PHEIs), Department of Higher Education</td>
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<td>Ministry of Higher Education Malaysia</td>
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<tr>
<td>10.00 – 10.30 a.m.</td>
<td><strong>Tea Break</strong></td>
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<td>10.30 – 11.15 a.m.</td>
<td><strong>Chair: Dr Ka Joo Chook, Advisor, TIC 2016</strong></td>
<td><strong>Plenary 1</strong></td>
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<td><strong>Internationalisation through Dual Awards</strong></td>
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<td>By Ms Kho Sok Kee &amp; Assoc Prof Dr Ng Swee Chin</td>
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<td>Vice Presidents, Tunku Abdul Rahman University College</td>
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<tr>
<td>11.15 – 12.00 p.m.</td>
<td><strong>Chair: Dr Ka Joo Chook, Advisor, TIC 2016</strong></td>
<td><strong>Plenary 2</strong></td>
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<td></td>
<td>By Dr John Wall, Head of School of Lifelong Learning and Education</td>
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<td>Waterford Institute of Technology, Ireland</td>
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<td>12.00 – 12.25 p.m.</td>
<td><strong>Room 1: Auditorium</strong></td>
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<td><strong>Room 3: AA109</strong></td>
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<td><strong>Room 4: AA102</strong></td>
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<td>Chair: Teck Hock Lim</td>
<td>Chair: Paul B H Ang</td>
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<td>Chair: Eng Hoe Wee</td>
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<td>A1</td>
<td>Invited Paper 1</td>
<td><strong>Invited Paper 2</strong></td>
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<td>Understanding the Learning Situation of Visually Impaired Students and Teaching Them Science</td>
<td>Innovative Learning Engagement for ESL Teacher Education Programme</td>
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<td></td>
<td>By Jeongho Cha</td>
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<td>Daegu University, Republic of Korea</td>
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<td>B1</td>
<td>Invited Paper 2</td>
<td><strong>Invited Paper 3</strong></td>
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<td>Innovative Learning Engagement for ESL Teacher Education Programme</td>
<td>Exploring the Impact of International Student Mobility on Cross-cultural Learning Adaptation</td>
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<td>By Raja Nor Safinas binti Raja Harun</td>
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<td>Universiti Pendidikan Sultan Idris, Malaysia</td>
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<td>C1</td>
<td>Invited Paper 3</td>
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<td>Exploring the Impact of International Student Mobility on Cross-cultural Learning Adaptation</td>
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<td>By Monika Foster, Edinburgh Napier University, United Kingdom</td>
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<td>D1</td>
<td>Workshop D1</td>
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<td>(12-1pm) Engaging Students in Entrepreneurship Studies by Using Team-Based Learning in an Enterprise University</td>
<td>By Peter Balan OAM, University of South Australia, Australia</td>
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<td>Time</td>
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<td>12.25 – 12.50 p.m.</td>
<td><strong>A2</strong> Practical Range of Ozone Concentration Simulation for Transmissive Gas Cells within 5 cm and 50 cm &lt;br&gt;By *Marcus Ching En Tay, Mohd Haniff Ibrahim, Nor Hafizah Ngajikin &amp; Asrul Izam Azmi, First City University College, Malaysia &amp; Universiti Teknologi Malaysia, Malaysia</td>
<td><strong>B2</strong> Students Attitude on Academic Help Seeking Behavior &lt;br&gt;By Umarani Jayaraman, Yenepoya University, India</td>
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<td>12.50 – 1.15 p.m.</td>
<td><strong>A3</strong> Enhance Students’ Concept Learning in Organic Chemistry Through “Must-Have” Quiz &lt;br&gt;By Jeongho Cha, Su-Yin Kan &amp; *Poh Wai Chia, Daegu University, South Korea, Universiti Sultan Zainal Abidin, Malaysia &amp; Universiti Malaysia Terengganu, Malaysia</td>
<td><strong>B3</strong> Using Action Research to Examine the Effects of Innovative Teaching Aids in Teaching Volleyball Skills during Physical Education Class &lt;br&gt;By *Ngien-Siong Chin, Eng-Hoe Wee, Kong-Swee Ong, Garry Kuan &amp; Hamsiah Abdullah Masni, Institute of Teacher Education Tun Abdul Razak Campus, Tunku Abdul Rahman University College, Sarawak Sports Corporation, &amp; Universiti Sains Malaysia, Malaysia</td>
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<td>1.15 – 2.15 p.m.</td>
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<tr>
<td>2.15 – 3.00 p.m.</td>
<td><strong>Keynote Address 1</strong>&lt;br&gt;The Context and Dynamic of the Entrepreneurial University &lt;br&gt;By Professor John Latham, Vice-Chancellor and CEO Coventry University, United Kingdom</td>
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<tr>
<td>3.00 – 3.45 p.m.</td>
<td><strong>Keynote Address 2</strong>&lt;br&gt;Holistic Education: Meaning, Contents and Implementation - Chung Yuan Christian University Approach &lt;br&gt;By Dr Wan-Lee Cheng, Leader Elite Study in Taiwan, Chair Professor Chung Yuan Christian University, Taiwan</td>
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<td>3.45 – 4.15 p.m.</td>
<td>TEA BREAK (POSTER PRESENTATION)</td>
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<td><strong>Parallel Sessions</strong></td>
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<td>Chair: Amy Yeo</td>
<td>Chair: Siew Chee Choy</td>
<td>Chair: Mui Joo Tang</td>
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<td><strong>4.15 – 4.40 p.m.</strong></td>
<td><strong>A4</strong></td>
<td><strong>B4</strong></td>
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<tr>
<td><strong>A4</strong> Embedding Digital Literacies in Curricula: Australian and Malaysian Experiences</td>
<td><strong>B4</strong> Learners’ Awareness Levels Questionnaire: A Brief Discussion on How the Measurement Tool is Developed and Validated</td>
<td><strong>C4</strong> Cynicism Towards Educational Change on Job Satisfaction of Teachers in an Educational District - Once Bitten, Twice Shy?</td>
</tr>
<tr>
<td>By *Rhian Morgan, Kathryn Meldrum, Sharon Bryan, Bronwyn Mathiesen, Nooraida Yakob, Norizan Esa &amp; Azidah Abu Ziden, James Cook University, Australia &amp; Universiti Sains Malaysia, MALAYSIA</td>
<td>By *Yow Lin Liew &amp; Siew Chee Choy, Tunku Abdul Rahman University College, Malaysia</td>
<td>By *Joanne SC Yim, Priscilla Moses &amp; Siew Chee Choy, Tunku Abdul Rahman University College &amp; Universiti Tunku Abdul Rahman, Malaysia</td>
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<td><strong>4.40 – 5.05 p.m.</strong></td>
<td><strong>A5</strong></td>
<td><strong>B5</strong></td>
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<td><strong>A5</strong> Factors Affecting University Students’ Satisfaction on Online Learning System</td>
<td><strong>B5</strong> A Preliminary Investigation on How and Why Malaysian Hospitality and Tourism Management Students Learn</td>
<td><strong>C5</strong> Perceptions of Stress Among Female Teachers Enrolled in Postgraduate Programmes in a Malaysian University</td>
</tr>
<tr>
<td>By *Sharon Tan, Francis Chuah &amp; Hiram Ting, Tunku Abdul Rahman University College, University Utara Malaysia &amp; Universiti Malaysia Sarawak, Malaysia</td>
<td>By Siew Chee Choy &amp; *Tengku Elvirozita, Tunku Abdul Rahman University College, Malaysia</td>
<td>By *Daljeet Singh Sedhu &amp; Siew Chee Choy, Tunku Abdul Rahman University College, Malaysia</td>
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<td><strong>5.05 – 5.30 p.m.</strong></td>
<td><strong>A6</strong></td>
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<td><strong>A6</strong> Use of iPads for Mastery of 21st Century Skills</td>
<td><strong>B6</strong> Invited Paper 5 A Comparison of Malaysian and American Learners’ Behaviour: The Mediating Role of Learners’ Awareness</td>
<td><strong>C6</strong> Development of Career Related and Teamwork Skills Using Service Learning in Undergraduate Architecture Education</td>
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<tr>
<td>By Emmy Ee Mei Jong, Pei Lin How &amp; *Shae Lynn Wong, Sunway College Johor Bahru, Malaysia</td>
<td>By Siew Chee Choy, *Jutta Street, Lorae Roukema &amp; Joanne SC Yim, Tunku Abdul Rahman University College, Malaysia &amp; Campbell University, USA.</td>
<td>By *TamilSalvi Mari, Sujatavani Gunasagaran, &amp; Sivaraman Kuppusamy, Taylor’s University, Malaysia</td>
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<td>5.30 – 5.55 p.m.</td>
<td><strong>A7</strong> The Effects of Social Network on Student Learning Experience</td>
<td><strong>A8</strong> Initial Considerations for Transnational Education Providers Regarding the Mapping of the East African Qualifications Framework to the European Qualifications Framework</td>
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<td>Chair: Amy Yeo</td>
<td>Chair: Siew Chee Choy</td>
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<td>By *Yuzhuang Ong, Daljeet Singh Sedhu &amp; Chai Yan Lai, Tunak Abdul Rahman University College, Malaysia</td>
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End of Day 1
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<tr>
<td>9.30 – 10.15 a.m.</td>
<td>Chair: Assoc Prof Dr Geok Bee Teh, Editorial Chair, TIC 2016</td>
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<td><strong>Keynote Address 3</strong></td>
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<td><em>Curriculum, Workforce and Digital Innovation in Higher Education</em></td>
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<td><em>How Will Universities Respond</em></td>
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<td>By Professor Allan Evans, Provost &amp; Chief Academic Officer</td>
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<td>University of South Australia, Australia</td>
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<td>10.15 – 10.45 a.m.</td>
<td>TEA BREAK</td>
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**Disclaimer**

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John Wall
Head of School of Lifelong Learning and Education Waterford Institute of Technology, Ireland

Abstract

The demands on employees and managers in the workplace are considerable, both in terms of time commitments at work and the range of skills necessary to execute their jobs effectively. Conventional designs of educational programs are usually based on implicit instructional design approaches that look equally at all learners. However, research indicates that learning is a complex activity involving a number of different aspects. Using technology to deliver and support learning adds another layer of complexity. Much of the research into deploying e-learning initiatives suggests that it is a complex undertaking and that educational institutions are at various stages in the development and deployment of technology-facilitated initiatives. A review of these drivers, with particular reference to initiatives in an Irish context is presented. In a challenging economic environment, some of the key strategic leadership challenges that institutions must address are presented. A number of management challenges are outlined that academic leaders must address in delivering the curriculum using technology. A proposed structure for deploying blended learning coupled with a model for educational managers to embrace in their strategic organisation of technology in delivering the curriculum is presented.

Introduction

The requirements on employees and managers in the workplace are considerable, both in terms of time obligations at work and the range of skills required to do their jobs effectively. Continuing professional development (CPD) can be considered as the planned acquisition of knowledge, experience and skills and the development of personal qualities necessary for the execution of professional and technical duties throughout a professional’s life, encompassing both technical and non-technical matters. Individuals benefit from CPD as it may present opportunities for career development, illustrate commitment to the individual’s chosen profession, boost career opportunities, enhance self fulfilment/personal development opportunities and help to overcome shortcomings an individual may have. Organisations also can benefit from having efficient and skilful staff form their image as a progressive firm committed to developing its people and opportunities for organisational learning to occur.

CPD can take a number of formats ranging from formal to informal and from traditional based instruction to 100% online CPD learning (Wall, 2009). Recognition exists within professional bodies for both formal and informal methods of learning. Figure 1 outlines the formats that CPD can take.

---

**Figure 1 Forms of CPD learning that exist**

**Continuing Professional Development**

**Formal**
Courses that are either:
- Technical: Updating professional knowledge and skills
- Contextual: Enhancing professional capabilities or relate to the solving of particular problems, leading to specialization

**Informal**
Can be categorised under 4 groups:
- Resource based: Mostly self-directed, journals, publications to keep up to date with developments in the field
- Practice based: Learning by observation and learning by doing, relate to "learning on the job"
- Practice related: Users own practical knowledge and includes activities such as giving lectures, teaching, writing articles etc.
- Interpersonal: Networking, sharing of knowledge among practitioners

Source: Wall (2009)
Conventional approaches to the design of programmes for workplace learning and development have been based on instructional design strategies in which there is an implicit assumption that the target group of learners will exhibit uniformity in the ways they process and organise information (Sadler-Smith and Smith, 2004). It is well recognised that this is not the case. In a traditional classroom situation the instructor has the opportunity to adapt the instruction to suit individual needs that is not available when material is delivered online (Logan and Thomas, 2002).

Consideration of the pedagogy is vital when attempting to understand the application of e-learning in practice (Mehanna, 2004). Matching cognitive and learning styles with instructional presentation strategies may have an important role to play in enhancing the learner’s learning experience (Ford and Chen, 2001). In a traditional classroom situation, the instructor has the opportunity to adapt the instruction to suit individual needs that is not available when material is delivered online (Logan and Thomas, 2002).

While organisations are faced with increasing costs needed to train employees in today’s high technology environment, educators are attempting to develop new training and teaching methods that will provide optimal transfer of learning and allow for complex skill acquisition (Andreas, 2004). This also adds pressure on educators and curricular developers to bridge the gaps between academia and industry, which is often proven uneasy, particularly in view of the rapid changes due to the arrival of new technologies.

The facilities and capabilities offered by e-learning and technology in the delivery of training are considerable. More and more people are using the Internet to communicate, instant messaging, browsing, finding entertainment information and reading news – “… today’s students think of the Internet the way their parents and their grandparents – and even their older siblings – viewed electricity: ubiquitous and only noticeable when not available” (Bruce, 2003; page 24).

**Learning and Instructional Design**

Learning can be defined as the acquisition of knowledge or skill (Oxford English Dictionary, 1991) or knowledge got by study (Collins English Dictionary Pocket Edition, 2007). Learning is not a simple act. The Chinese proverb, attributed to Confucius (450 B.C.), summarises the importance of understanding the pedagogical processes that take place when learning occurs:

“Tell me, and I will forget, show me, and I may remember, involve me, and I will understand.”

There is no definitive agreement on what e-learning is and on terminology used to describe the use of technology in learning (Romiszowski, 2004). Romiszowski (2004) found more than 50 different definitions of the term. From this research he developed what he terms a “structured definition of e-learning”. The framework developed is as illustrated in table 1.

<table>
<thead>
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<th>Table 1 Structured Definition of E-learning</th>
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<tr>
<td><strong>INDIVIDUAL SELF STUDY</strong></td>
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<tr>
<td><strong>GROUP COLLABORATIVE</strong></td>
</tr>
<tr>
<td>Computer Based Instruction/Learning/Teaching</td>
</tr>
<tr>
<td>(CBI/L/T)</td>
</tr>
<tr>
<td>Synchronous Communication (“REAL-TIME”)</td>
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<tr>
<td>OFFLINE STUDY</td>
</tr>
<tr>
<td>Asynchronous Communication (“FLEXI-TIME”)</td>
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</tbody>
</table>

Source: Romiszowski (2004, page 6)

The framework put forward by Romiszowski (2004) emphasises that e-learning may be either a solitary individual activity or a collaborative group activity where both synchronous and asynchronous communication can take place or a combination of all of these. However, one should recognise that there are advantages and disadvantages with traditional versus e-learning in delivering learning, summarised in table 2.
Table 2 Traditional classroom learning versus e-learning

<table>
<thead>
<tr>
<th>Advantages</th>
<th>E-Learning</th>
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<tr>
<td>Immediate feedback</td>
<td>Learner-centred and self-paced</td>
</tr>
<tr>
<td>Being familiar to both instructors and students</td>
<td>Time and location flexibility</td>
</tr>
<tr>
<td>Motivating students</td>
<td>Cost-effective for learners</td>
</tr>
<tr>
<td>Cultivation of a social community</td>
<td>Potentially available to global audience</td>
</tr>
<tr>
<td></td>
<td>Unlimited access to knowledge</td>
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<tr>
<td></td>
<td>Archival capability for knowledge reuse and sharing</td>
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<table>
<thead>
<tr>
<th>Disadvantages</th>
<th></th>
</tr>
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<tbody>
<tr>
<td>Instructor-centred</td>
<td>Lack of immediate feedback in asynchronous elearning</td>
</tr>
<tr>
<td>Time and location constraints</td>
<td>Increased preparation time for the instructor</td>
</tr>
<tr>
<td>More expensive to deliver</td>
<td>Not comfortable to some people</td>
</tr>
<tr>
<td></td>
<td>Potentially more frustration, anxiety and confusion</td>
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</table>

Source: Zhang et al. page 76 2004

Adams (2004) suggests that computer based learning has three elements; (i) hardware, (ii) software and (iii) ‘underware’ – the pedagogy that underpins the e-learning development. Tham and Werner (2005) suggest that as educators there is a requirement for a variety of skills sets or “hats” including (i) a technological hat, (ii) a pedagogical hat and (iii) a social hat. Sadler-Smith and Smith (2004) suggest that there are three distinct categories of strategy development that are required in accommodating flexible learning in the workplace: (i) teaching strategy, (ii) learning strategy and (iii) support strategy. These statements serve to highlight that formulating a framework or model that integrates technology to deliver learning is a complex undertaking, including pedagogical, technological and socialisation aspects.

The Learning Process

Different learners have different cognitive processes, learning style preferences and past experiences that they apply when learning takes place (Honey and Mumford, 1982; Kolb, 1984 and Riding, 1996). An individual’s learning style will affect the manner in which information is processed during learning and thinking, having a considerable effect on the learning effectiveness and efficiency (Riding, 1996). Sadler-Smith (1996) referred to the learner as having 3 dimensions of learning preferences outlined in figure 2.

Figure 2 Three learning preferences or styles

![Three learning preferences or styles](image)

Source: Sadler-Smith (1996)
In defining the traits of these three types of learners Sadler-Smith categorised them as:

1. **Dependent learners** – prefer instructor-directed, highly structured programmes with explicit assignments and assessment by the instructor
2. **Collaborative learners** – are discussion orientated and favour group projects, collaborative assignments and social interaction
3. **Autonomous learners** – prefer to exercise an influence on the content and structure of learning programmes within which the instructor is a resource.

The preferred learning style of the individual is important for learning to be more effective when one is considering using technology based learning for a new skill, increasing knowledge and sharing information (James-Gordon and Bal, 2001). Different cognitive style groups benefit from different types of multimedia presentation (Ghinea and Chen, 2003). One of the most attractive features of computer based instruction is its capacity to individualise instruction, present content in a variety of ways (e.g. text, audio, video, graphics) and allow the user to progress and her or her own pace (Ross and Schulz, 1999).

Delivering distance learning can involve a host of teaching and learning practices that can offer convenience for students but may be far more labour intensive for staff in higher-level institutes. For staff it includes (i) creating courses, (ii) maintaining chat rooms, (iii) responding to students queries by email around the clock, (iv) the new expectations of students on these programs including “anytime, anyplace learning,” “round-the-clock availability of instructors,” and “24/7 advising” (Alexander, 2001 and Levine and Sun, 2002). Newton (2003) in an analysis of funded research by the Learning and Technology Support Network – Information and Computing Studies Group identified the following barriers to using technology in teaching and learning within the academic community in the UK: (i) increased time commitment, (ii) lack of incentives or rewards, (iii) lack of strategic planning and vision, (iv) lack of support, (v) lack of training in use of the technology, (vi) lack of support for pedagogical aspects of developments, and (vii) philosophical, epistemological, and social objections.

**Challenges in Higher Education**

There are a number of challenges that are facing both higher education and the construction industry. Many of these challenges are driven by the need for change. These changes are forced upon both construction organisations and higher education, often due to changes in government policies, society and culture, making it harder to strike the balance between the educational methods of delivery and meeting the demands of a highly competitive construction industry. This also adds pressure on educators and curricular developers to bridge the gaps between academia and industry, which has often proven difficult, particularly in view of the rapid changes due to the arrival of new technologies.

Much of the research into deploying e-learning initiatives suggests that it is a complex undertaking and that educational institutions are at various stages in the development and deployment of technology-facilitated initiatives. McPherson and Nunes (2008) suggest that the role of academic leadership is to balance the dramatic effect that the political and social changes have had on teaching and learning within higher education institutions and guide institutions through the development of sound strategic change. Their research suggests that if “top-down” strategies are devised to implement e-learning strategies, it is the duty of academic leaders to ensure that appropriate levels of staffing and support are put in place.

The critical success factors to facilitate this are captured in table 3.

**Table 3** Critical success factor ontology for e-learning delivery: Leadership issues

<table>
<thead>
<tr>
<th>Provide inspirational leadership</th>
<th>Examples of issues for consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realize agreed strategy</td>
<td>Have issues of ownership and Internet protocol been clarified?</td>
</tr>
<tr>
<td>• Involve staff in change processes</td>
<td>Have issues of culture/class/gender been resolved?</td>
</tr>
<tr>
<td>• Focus on changing role of educational professionals</td>
<td>Opens up options for students but may be threatening to tutors – could a slow and gradual transition be put in place?</td>
</tr>
</tbody>
</table>
Is it possible to encourage a culture of open and evolving commitment?

<table>
<thead>
<tr>
<th>Understand motivation for engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Offer recognition for staff commitment</td>
</tr>
<tr>
<td>• Appreciate motivation of learners</td>
</tr>
<tr>
<td>Have motivational factors of the educational staff been determined?</td>
</tr>
<tr>
<td>Is there a way to acknowledge dedication of teaching staff?</td>
</tr>
<tr>
<td>Is motivation of virtual learning environment providers and developers the same as delivery staff?</td>
</tr>
<tr>
<td>Are there incentives for the application of an e-learning framework?</td>
</tr>
<tr>
<td>Has it been determined whether students are sufficiently independent and motivated to able to undertake computer-based learning?</td>
</tr>
<tr>
<td>Can students see the benefits?</td>
</tr>
<tr>
<td>Where e-learning is deemed desirable, are targets and customers well-defined?</td>
</tr>
<tr>
<td>What are motivational factors for learners, i.e., rewards for learners?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Understand what is deemed acceptable and usable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can academic staff be convinced that e-learning will work, i.e., do they have a wish to use and develop new tools?</td>
</tr>
<tr>
<td>How are teaching staff going to use it?</td>
</tr>
<tr>
<td>Do students’ users want it and will they use it?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ensure sufficient resourcing</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Create (or at least measure) the demand for e-learning as a method of learning</td>
</tr>
<tr>
<td>• Guarantee sufficient funding</td>
</tr>
<tr>
<td>Can teaching staff be persuaded of the need for convergency and flexibility to enhance students learning experiences?</td>
</tr>
<tr>
<td>Can a move away from expectation of two lecturers, one lab, one tutorial, etc., per week be encouraged?</td>
</tr>
<tr>
<td>Have issues of affordability and viability been determined?</td>
</tr>
<tr>
<td>Has time resourcing, e.g., more time to teach online, been taken into account?</td>
</tr>
</tbody>
</table>


The challenge for educational institutions is to get the best from the available resources and ensure that programme meets the objectives of participants in the context of the resources available. Even when the financial resources are available to invest in e-learning content, it does not ensure the success of a course. In the absence of resources to develop sophisticated e-learning content, the instructor must be empowered to embrace blended learning and acknowledge that his or her role must change. This presents significant strategic challenges for leaders in educational institutions.

Garrison and Kanuka (2004) suggest that for academic administrators and leaders, the successful adoption of a blended learning approach requires the following:

1. Creation of clear institutional direction and policy
2. Frame the potential, increase awareness, and commit
3. Establishment of a single point of support, quality assurance, and project management
4. Creation of an innovation fund to provide the financial support and incentives to faculty and departments to initiate blended learning course transformation
5. Strategic selection of prototype projects that prove to be exceptionally successful exemplars of effective learning
6. Development of formal instructional design support available through a blended format
7. Systematic evaluation of satisfaction and success of the teaching learning, technology, and administration of new course
8. Create a task group to address issues, challenges, and opportunities as well as communicate and recommend new directions for the higher education community.

At an institutional level, the Higher Education Authority report (2009) titled “Open and Flexible Learning – HEA Position Paper” suggested that matters such as innovative and imaginative timetabling, off-campus and workplace provision, etc., need to be addressed in encouraging staff involvement and facilitating greater engagement from learners. Subsequent to this the Higher Education Authority established the National Forum for the Enhancement of Teaching and Learning in Higher Education to plat a central role in enhancing the teaching and learning for all students in higher education in Ireland. The organisation’s goals include:
1. Championing all those who contribute to great teaching and learning in higher education
2. Inspiring great practice, by celebrating examples of teaching that have a strong and positive impact on learning
3. Developing teachers and learners
4. Identifying and promoting best practice in professional development
5. Building digital capacity
6. Promoting key enhancement themes
7. Enabling innovation in a fast-changing educational environment.

Source: National Forum for the Enhancement of Teaching and Learning website (www.teachingandlearning.ie)

The importance of on-going professional development for teaching staff is highlighted in a National Forum report on Strategic and Leadership Perspectives on Digital Capacity in Irish Higher Education (2015). One key from this report is that increasing the levels and depth of CPD activities for academic staff is “critical” if efforts building digital capacity are to be successful. The National Forum found that leaders within educational providers have the will to develop digital capacity but that significant barriers are created by constraints in terms of the numbers of support staff, resource and demographic pressures, and a general lack of agreement on what digital capacity involves.

In the UK, research by Joint Information Systems Committee (JISC, 2008) highlighted through a series of case studies that the tangible benefits of integrating technology in program delivery can be categorized as (i) cost savings / resource efficiency, (ii) recruitment and retention, (iii) skills and employment, (iv) student achievement, (v) inclusion, (vi) widening participation and social equality, and (vii) other benefits. The HEFCE in a 2009 report titled “Enhancing Learning and Teaching through the Use of Technology – A Revised Approach to HEFCE’s Strategy for e-Learning” has developed a framework to assist institutions in maximizing the strategic benefits of technology outlined in table 4. Underpinning this report is recognition of the diverse institutional missions and strategic priorities meaning that it would be counter-productive to prescribe institutional activities. The intention of this HEFCE report is to highlight those strategic areas where institutions may see a benefit from investing in technology and to help institutions map those benefits to specific institutional goals, strategic plans, or internal documents.

The framework is designed to help classify priorities for development. The implementation scaffolding is designed to be flexible, and HEFCE anticipate that institutions will adjust this framework to suit their specific requirements. In order to plan effectively for enhancement, institutions will need to convert these into specific goals, development pathways, and measures of success.

Table 4 Enhancing learning and teaching through the use of technology: A suggested framework for institutions

<table>
<thead>
<tr>
<th>Activity area</th>
<th>Strategic priorities</th>
<th>Harnessing technology for strategic gain – examples of development goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pedagogy,</td>
<td>Enhancing excellence</td>
<td>Tutors have access to a wide range of tools to support teaching, and a</td>
</tr>
<tr>
<td>curriculum</td>
<td>and innovation in</td>
<td>wide range of high-quality resources to engage students. Innovative</td>
</tr>
<tr>
<td>design, and</td>
<td>teaching and</td>
<td>uses of technology for learning are supported by the curriculum design</td>
</tr>
<tr>
<td>development</td>
<td>learning</td>
<td>process. Technology is used to enhance the responsiveness and</td>
</tr>
<tr>
<td></td>
<td>Enhancing flexibility and choice for learners</td>
<td>flexibility of curriculum offerings. Technology is used to help identify learners with specific aptitudes or needs. Information and information systems are used effectively to support curriculum planning. Web 2.0 technologies are harnessed to support communities of learning and research. E-assessment technologies are used to support innovative practices such as just-in-time assessment and peer review. Students are developing their digital and learning literacies throughout their studies. Technologies for teaching and research are joined</td>
</tr>
<tr>
<td></td>
<td>Enhancing student achievement Improving employability and skills Attracting and retaining learners Supporting research-based or enquiry-based learning Engaging employers (or other stakeholders) in curriculum design and delivery Improving efficiency of curriculum design and delivery processes</td>
<td></td>
</tr>
</tbody>
</table>
The application of e-learning makes it possible for education to transcend space, time and political boundaries (Raab et al., 2002). Cost conscious managers in higher-level institutes can enhance the utilisation of resources by using a variety of distance learning technologies ranging from low cost print to more expensive leading edge technology (Banas and Emory, 1998). For educational institutions and instructors faced with a variety of choices in terms of multimedia solutions more trainers and human resource specialists realise that it is all down to finding the right blend and making sure it is well prepared (Trasler, 2002).

### Proposed Strategic Deployment Model

Blended learning offers institutions the opportunity to engage in using technology in conjunction with traditional delivery to offer learning. The issue then becomes how to configure this blend. There are often clear differences between the various subject disciplines in terms of technological and pedagogical innovation and what appears well embedded in one subject area may be quite innovative in another. Institutions are challenged to identify appropriate strategies for the various subject discipline areas.

On the basis of detailed research carried out in Waterford Institute of Technology in Ireland, where the deployment of a blended learning initiative was evaluated from both participants’ and instructors’ perspectives, a proposed framework for deploying lifelong learning is outlined in table 5, identifying milestones, looking at key aspects of each milestone, suggesting possible activities to be undertaken to address the key aspects identified, and identifying the possible benefits as a result.

<table>
<thead>
<tr>
<th>2. Learning resources and environments</th>
<th>Enhancing flexibility and choice for learners</th>
<th>Students can access information, support, expertise and guidance, and communicate with each other, wherever they are studying. Students can access personalized services within institutional environments, and use personal tools to suit their individual needs. Tools for scholarly communication are widely used, for example for feedback, collaborative research, and peer review. Tutors are collaborating in subject communities to produce high-quality, reusable learning resources. Tutors have access to relevant learning resources, and support for adapting, integrating, and enhancing them. There is continuity across learning, teaching, research, and administrative environments to support joined-up processes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhancing student achievement</td>
<td>Improving employability and skills</td>
<td></td>
</tr>
<tr>
<td>Widening participation and improving access</td>
<td>Effective management of learning resources</td>
<td>Students can access information, support, expertise and guidance, and communicate with each other, wherever they are studying. Students can access personalized services within institutional environments, and use personal tools to suit their individual needs. Tools for scholarly communication are widely used, for example for feedback, collaborative research, and peer review. Tutors are collaborating in subject communities to produce high-quality, reusable learning resources. Tutors have access to relevant learning resources, and support for adapting, integrating, and enhancing them. There is continuity across learning, teaching, research, and administrative environments to support joined-up processes.</td>
</tr>
<tr>
<td>Designing and maintaining effective environments for learning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Lifelong learning processes and practices</td>
<td>Improving employability and skills</td>
<td>Students can record, access, reflect on, and present their achievements in ways appropriate to a variety of situations. Assistive and personal technologies are used effectively to support students with diverse needs and aptitudes. Local and regional communities are involved with the institution via electronically supported networks, for example, through lifelong learning networks. Students can access information online to make informed choices about their programs of study including choices about how and where to access learning. Technology is used to help students connect formal study with other aspects of life and work. Joined-up information systems support students in transition or while studying at more than one location or institution.</td>
</tr>
<tr>
<td>Enhancing flexibility and choice for learners</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Widening participation and improving access to learning opportunities</td>
<td>Supporting diverse learners’ needs</td>
<td>Students can record, access, reflect on, and present their achievements in ways appropriate to a variety of situations. Assistive and personal technologies are used effectively to support students with diverse needs and aptitudes. Local and regional communities are involved with the institution via electronically supported networks, for example, through lifelong learning networks. Students can access information online to make informed choices about their programs of study including choices about how and where to access learning. Technology is used to help students connect formal study with other aspects of life and work. Joined-up information systems support students in transition or while studying at more than one location or institution.</td>
</tr>
<tr>
<td>Retaining learners and meeting learners’ expectations</td>
<td>Co-operating with other institutions, colleges, and campuses</td>
<td>Students can record, access, reflect on, and present their achievements in ways appropriate to a variety of situations. Assistive and personal technologies are used effectively to support students with diverse needs and aptitudes. Local and regional communities are involved with the institution via electronically supported networks, for example, through lifelong learning networks. Students can access information online to make informed choices about their programs of study including choices about how and where to access learning. Technology is used to help students connect formal study with other aspects of life and work. Joined-up information systems support students in transition or while studying at more than one location or institution.</td>
</tr>
</tbody>
</table>

Source: HEFCE (2009)
It is fundamental at the outset to appreciate the learning process, which can be done in the following ways: By acknowledging that learning is complex, instructors and educational institutions should be open to new ideas / increased flexibility. The use of a learning style profiling tool such as Kolb Learning Style Inventory can assist in making instructors aware that there are many learner types and plan for a variety of instructional strategies, ensuring the benefits of understanding the variety of learner types. Establishing the appropriate infrastructure and standards of delivery will ensure a minimum standard of consistency. This still recognizes that instructors...
may be at different levels of confidence and experience in the use of technology in the delivery of learning. It will also encourage instructors who gain confidence to become more sophisticated and advanced in their use of technology over time.

By agreeing the breakdown of classroom and online elements prior to the commencement of the program, instructors know what is expected and participants can plan how to integrate formal CPD into their work and personal life. It helps plan dates and times for traditional delivery in advance. By focusing explicitly on assessment at the outset, instructors can plan a coherent assessment strategy and an evenly distributed workload can be achieved. Recognizing the ICT infrastructure of the participants’ highlights at the outset of any potential problems, allowing for these challenges to overcome/mitigate early during the program. This will help in providing an appropriate level of induction, ensuring a smooth delivery and administration of the program. The use of multiple methods of communication allows the integration of both asynchronous and synchronous communications and also acknowledges the variety of possible learning styles as mentioned earlier. The usefulness of social events should not be underestimated. As regards breaking down barriers, it can help build community morale on the program.

Identifying the creation of online resources as a discrete milestone challenges institutions to take a strategic approach to deploying blended learning. Searching for new/novel methods to encourage active learning helps build on the experiential learning of the group and encourages a continuous search for new instructional approaches. Finally, recognising the key role of staff will ensure the initial and ongoing level of success or otherwise of the blended approach.

Conclusion

The demands on higher education providers continue to increase in an environment where there has been a reduction in funding levels from government with a concurrent reduction in overall staff levels. The commitment to increase provision and access to lifelong learning opportunities is a strategic priority for higher education. There are issues that must be addressed in effectively delivering lifelong learning which may be clustered around four principal themes; (i) continuing professional development, (ii) understanding the learning process, (iii) higher education’s role and (iv) technological issues and challenges. Key success factors in delivering lifelong learning include; (i) acting professionally, (ii) collaboration between education and industry and (iii) creating an environment that encourages and facilitates access to lifelong learning.

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A1

Understanding the Learning Situation of Visually Impaired Students and Teaching Them Science

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Abstract

In spite of more than 50 years of formal special education in Korea, very little attention has been paid to teaching science to the students with disabilities. Furthermore, science was reported as disliked subjects for special educators. One of the reason is that there is not enough teaching materials for the disabled students. If we, as science educators, don’t care about this situation, real meaning of “science for all” cannot be achieved thoroughly. Over the last decade, my colleagues and I have struggled to develop hands-on activities for the students with disabilities. As a result, we’ve held a science festival and an after-school class which was specially designed for students’ disabilities including visual impairments, hearing impairments, mental retardation, and so on. Although events went successfully every year, and students and teachers from special education schools were satisfied, we’ve just realized that we still didn’t know how they learn science. Does the teaching material works well as we intended? What do students feel and think during inquiry activities? Is there any needed training for teachers who are teaching students with disabilities? As a beginning of new journey focusing on visual impairment, my student and I designed ‘the scientific inquiry in the darkroom activity’ for sighted pre-service and inservice science teachers so that they can experience learning situation of blind students with tactile models of ice and eye. Participants were encouraged to touch both models and to discuss with researchers and participants during the activities. Through an analysis on the discussions and short surveys, we could get a glimpse how science educators, special education teachers, and pre-service science teachers learnt out blind students’ learning situation from the darkroom activity. I would like to share this experience in addition to teaching and learning materials for students with visual impairments.

Keywords: Darkroom Activity; Hands-on Activity; Scientific Inquiry; Special Education; Visual Impairment
A2

Practical Range of Ozone Concentration Simulation for Transmissive Gas Cells within 5 cm and 50 cm

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Abstract

Gas cells of different length have been previously designed for measurement of ozone through ultraviolet absorption spectroscopy, but each gas cell is used for measurement of single range of concentration only. In this work, practical ranges of ozone concentration measurement for transmissive gas cells between 0.05 m and 0.50 m are theoretically calculated and verified via spectralcalc.com gas cell simulator. Selections of optical path length and concentration range to be considered practical are justified. Gas cell of optical path length 0.05 m is found to be practical for measurement between 3.57 ppm and 471.61 ppm. Decrease of range of concentration measurement is observed when optical path length is increased from 0.05 m to 0.25 m. However, further increase of optical path length beyond 0.25 m has small effect on reduction of dynamic range of concentration.

Keywords: concentration, optical path length, ozone, range, simulation, ultraviolet absorption spectroscopy

Introduction

Today, various methods have been adopted for research purpose, namely interviews, questionnaires and observations. In the field of engineering, research is not completed without data collection. The parameters of interest are usually theoretically calculated, verified via simulation and measured in experiment. Experiment that is done via trial and error is time consuming and not productive. Simulation work is important, as it is part of a systematic process to investigate the validity of theory. Experimental setup usually requires capital. Hence, risk of experimental failure is high, if no proper planning is done. If simulation result is not as expected in theory, users can still troubleshoot the problem at low cost. Positive outcome of simulation result can be used as a guide to setup experiment. In short, proper planning through simulation is important before researchers make decisions to venture in a project.

In this study, we propose an online virtual learning environment that is accessible worldwide for measurement of ozone concentration via ultraviolet absorption spectroscopy. Ultraviolet absorption spectroscopy are commonly applied for ozone concentration measurement, as the method is reliable for long term usage. The software for high resolution spectral modelling, spectralcalc.com, can be used to support teaching and learning environment in class, final year projects, verification of researchers’ experimental data. In this paper, we demonstrate the use of this online learning environment to investigate the range of practical ozone concentration that can be measured using transmissive gas cell within 5 cm and 50 cm.
Research Problem

Ozone is a colourless oxidizing gas, but has a pungent smell. In nature, ozone exists at stratosphere to absorb harmful ultraviolet radiation from reaching the earth. In practice, ozone is generated on site at different concentration for specific application. For example, 0.025 g m$^{-3}$ to 0.045 g m$^{-3}$ of ozone is applied for preservation of tomatoes [1]; whereas, 10 g m$^{-3}$ to 50 g m$^{-3}$ of ozone [2] is used for wastewater recycling. The concentration difference between these two applications is more than 400 times. Therefore, there is a need to design an ozone sensor for specific range of concentration measurement. Previously, gas cells of length between 5 cm and 63 cm have been designed for ozone concentration measurement through absorption spectroscopy [3–12]. Some of the previous work utilize transmissive type of gas cell [3, 6, 8, 9, 12]. However, gas cell has specific optical path length for specific range of measurement of ozone concentration only.

Objective of the Study

Objective of this study is to simulate practical range of ozone concentration measurement for transmissive gas cells between 5 cm and 50 cm. This objective is achieved through the use of spectralcalc.com online simulation software, because the software is practical and cost effective to study the principle of operation of ultraviolet absorption spectroscopy for ozone sensing application. The software is helpful for science and engineering students to understand the relation among parameters in Beer-Lambert law, because theoretical calculation results can be compared with simulation results.

Theoretical Analysis

Relevant theoretical principle is discussed in this section.

Transmissive Gas Cell

Figure 1 shows transmissive gas cell in this work. It consists of a cylindrical gas cell that contains sample ozone gas. Intensity of light decays exponentially as it passes through sample gas for specific length. This may be theoretically explained through Beer-Lambert law.

![Transmissive gas cell modelled using Zemax Part Designer. Light from optical fiber interacts with ozone sample in a straight gas cell.](image)

Figure 1. Transmissive gas cell modelled using Zemax Part Designer. Light from optical fiber interacts with ozone sample in a straight gas cell.

Beer – Lambert Law

In ultraviolet absorption spectroscopy, ozone concentration may be obtained based on well established Beer-Lambert law as shown in Equation 1. Interested readers may refer to the literature [13 – 15] for more information of this law. Equation 1 shows ozone concentration is dependent on optical path length and transmittance of light through gas cell.

\[
c_{(\text{ppm})} = -1000000RT/(\sigma N_A P_l) \times \ln(I/I_0) \quad (1)
\]

\[
T_r = I/I_0 \quad (2)
\]

\[
c_{(\text{ppm})} = \text{ozone concentration in ppm by volume}
\]
$I_0 =$ input intensity to ozone sample in count  
$I_t =$ output intensity from ozone sample in count  
$l =$ optical path length in m  
$N_A =$ Avogadro’s constant, $6.02214199 \times 10^{23}$ molecule mol$^{-1}$  
$P =$ pressure in atm  
$R =$ ideal gas constant, $8.205746 \times 10^{-5}$ atm m$^3$ mol$^{-1}$ k$^{-1}$  
$T =$ absolute temperature in K  
$T_r =$ transmittance  
$\sigma =$ absorption cross section in m$^2$ molecule$^{-1}$

**Practical Ozone Concentration Selection**

Transmittance, $I_t/I_0$ from 0.516 to 0.995 is previously achieved [3]. This is calculated based on information in the paper. At maximum detection limit 0.97 mg/l, $I_0 = 370$ count, $I_t = 191$ count; therefore, $I_t/I_0 = 0.516$. At minimum detection limit 0.03 mg/l, $I_0 = 370$ count, $I_t = 368$ count; therefore, $I_t/I_0 = 0.995$. Hence, transmittance, $I_t/I_0$ between 0.516 and 0.995 is assumed to be practical to achieve and used in this work for calculation of ozone concentration.

**Practical Optical Path Length Selection**

Optical path lengths between 5 cm and 50 cm are selected for this work analysis, because gas cells within 50 cm are shown to have fast response time of a few seconds [3, 4, 7-9, 10, 12]. Reflective gas cell of 63 cm is shown to respond slowly at 60 s [11]. Ultraviolet absorption spectroscopy is considered to have low absorption sensitivity compared to cavity enhanced absorption spectroscopy [16], especially for very short gas cell of less than 5 cm. Short optical path length results in small light intensity decrease when light passes through sample. Therefore, transmissive gas cells between 5 cm and 50 cm are considered to be practical for analysis in this work.

**Research Methodology**

Methodology of this study consists of theoretical calculation and online simulation.

**Theoretical calculation**

Firstly, calculation of ozone concentration, $c_{(ppm)}$ up to two decimal places are done through Beer-Lambert law in Equation 1 based on following input parameters:

\[
\sigma = 1.147 \times 10^{-21} \text{ at peak absorption wavelength 253.65 nm [17]}
\]

$N_A = 6.02214199 \times 10^{23}$ molecule mol$^{-1}$  
$P = 1$ atm  
$R = 8.205746 \times 10^{-5}$ atm m$^3$ mol$^{-1}$ K$^{-1}$  
$T = 300$ K  
$l = 0.05$ m, 0.10 m, 0.15 m... 0.50 m  
$I_t/I_0 = 0.516, 0.995$

**Spectralcalc.com Simulation**

Secondly, simulation is done using gas cell simulator of spectralcalc.com [18] to verify calculation result. Following parameters are input to the simulator to obtain output transmittance, $I_t/I_0$ at peak absorption wavelength 255.442 nm.

$N_A = 6.02214199 \times 10^{23}$ molecule mol$^{-1}$  
$P = 1013.25$ mbar  
$R = 8.205746 \times 10^{-5}$ atm m$^3$ mol$^{-1}$ K$^{-1}$  
$T = 300$ K  
$l = 0.05$ m, 0.10 m, 0.15 m... 0.50 m  
$c_{(ppm)} =$ as calculated in two decimal places  
Waveband = 0.24 µm to 0.27 µm  
Line list = HITRAN2008  
Gas = O$_3$
Results /Discussions

Figure 2 shows practical range of ozone concentration measurement for optical path length between 0.05 m and 0.50 m. Results obtained are in close agreement between theoretical calculation (transmittance from 0.516 to 0.995) and spectralcalc.com simulation (transmittance from 0.5157 to 0.9950). Four observations may be made in Figure 2.

![Figure 2](image.png)

Firstly, practical values from Figure 2 may be extracted for concentration range interpretation in Table 1. Table 1 is useful for prediction of ozone concentration measurement for gas cell of specific optical path length. For example, optical path length of 0.05 m is practical for concentration measurement from 3.57 ppm to 471.61 ppm.

<table>
<thead>
<tr>
<th>Optical path length (m)</th>
<th>Dynamic range of concentration (ppm)(^a, b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.05</td>
<td>3.57 to 471.61</td>
</tr>
<tr>
<td>0.10</td>
<td>1.79 to 235.80</td>
</tr>
<tr>
<td>0.15</td>
<td>1.19 to 157.20</td>
</tr>
<tr>
<td>0.20</td>
<td>0.89 to 117.90</td>
</tr>
<tr>
<td>0.25</td>
<td>0.71 to 94.32</td>
</tr>
<tr>
<td>0.30</td>
<td>0.60 to 78.60</td>
</tr>
<tr>
<td>0.35</td>
<td>0.51 to 67.37</td>
</tr>
<tr>
<td>0.40</td>
<td>0.45 to 58.95</td>
</tr>
<tr>
<td>0.45</td>
<td>0.40 to 52.40</td>
</tr>
<tr>
<td>0.50</td>
<td>0.36 to 47.16</td>
</tr>
</tbody>
</table>

\(^a\) Based on theoretical calculation using transmittance from 0.516 to 0.995  
\(^b\) Based on SpectralCalc.com simulation to obtain transmittance from 0.5157 to 0.9950

Secondly, constant gap space exists between two lines in Figure 2. Existence of gap between the lines may be theoretically explained by division of two sets of Equation 1. All parameters are kept constant except transmittance, \(I/I_0\). In theory, concentration at transmittance 0.5157 is more than concentration at transmittance 0.9950 by a factor of \(\ln(0.5157)/\ln(0.9950)\) or 132.1. Based on simulation result at optical path length 0.05 m,
concentration at transmittance 0.5157 (471.61 ppm) is more than concentration at transmittance 0.9950 (3.57 ppm) by a factor of 132.1.

Thirdly, shift of concentration measurement is observed when optical path length is changed. The higher the optical path length, the lower the range of ozone concentration measurement as shown in Table 1. This will be further elaborated below.

Fourthly, the shift of concentration is evident from optical path length 0.05 m to 0.25 m only. For example, dynamic range of concentration at 0.05 m optical path length (3.57 ppm to 471.61 ppm) is very much more than dynamic range of concentration at 0.25 m optical path length (0.71 ppm to 94.32 ppm). Further increase of optical path length beyond 0.25 m results in small decrease in concentration measurement. For example, dynamic range of concentration at 0.25 m optical path length (0.71 ppm to 94.32 ppm) is slightly more than dynamic range of concentration at 0.05 m optical path length (0.36 ppm to 47.16 ppm).

Finally, trend of concentration shift observed in this work is consistent with previous work. For example, 4 cm gas cell may measure up to 100 ppm of ozone; whereas, 40 cm gas cell may measure up to 10 ppm of ozone [4, 7]. This shows comparison with previous work are in close agreement. In short, optical path length is shown to affect range of ozone concentration measurement, especially optical path length between 0.05 m and 0.25 m.

Contributions of the study

The use of spectralcalc.com online learning environment to study ultraviolet absorption spectroscopy for ozone sensing application is demonstrated. The relation between practical range of ozone concentration measurement and optical path length of gas cell is verified based on theoretical calculation and spectralcalc.com gas cell simulator. The spectralcalc.com online simulation tool is recommended for science and engineering students to interactively study ultraviolet absorption spectroscopy for ozone concentration measurement. Online simulation environment is user friendly and cost effective for postgraduate students to conduct preliminary research about ultraviolet absorption based ozone sensor.

Conclusions

In conclusion, practical ranges of ozone concentration measurement have been theoretically calculated and verified via spectralcalc.com gas cell simulator. Simulation result shows shift of range of concentration measurement when optical path length is varied. The higher the optical path length, the lower the dynamic range of concentration. Transmissive gas cell of optical path length 0.05 m is recommended for measurement of ozone concentration from 3.57 ppm to 471.61 ppm. To reduce range of ozone concentration measurement, optical path length should be increased. The use of spectralcalc.com online simulation tool is recommended as preliminary study for ultraviolet absorption based ozone sensor. Further experimental work is recommended to verify simulation results.

Acknowledgement

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References


Enhance Students’ Concept Learning in Organic Chemistry through “Must-have” Quiz

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Abstract

Effective learning of chemistry fundamental concepts is crucial for first-year organic chemistry students so that they can comprehend and understand a concept better and able to perform problem solving. In Malaysia, students’ conceptual understanding was found to be weak and some of them have developed misconception in concepts. In order to be at the par of other developed countries, such as Japan, South Korea and Singapore, our nation needs human capital that are capable mastering in science and technology that based on knowledge economy. As such, there is an urgent need to look for an alternative pedagogies to enhance students’ conceptual learning. In this paper, the interactive anonymous “Must-have” quiz was employed in the author’s classroom to teach basic organic chemistry course. Overall, this activity has promoted several positive learning outcomes as reflected in the students’ reflective writing.

Keywords: Concept learning; Interactive anonymous quiz, Organic chemistry.

Introduction

Organic chemistry has long been regarded as a tough subject and students sometimes fail to comprehend the basic concepts learnt in the lecture. As a consequence, students continue to lag behind and shun away from this subject. Study of concepts involve the understanding of basic concepts and how this basic operation relate to other operations. In a study1, students’ conceptual understanding was found to be weak and some of them have developed misconception in concepts. In addition, the existence of alternative concepts were identified to be caused by the following factors; failure to understand the term, unable to master the concept and fail to apply in problem solving. As such, there is an urgent need for an intervention that could enable students to learn more effectively and easily a concept.

In the past, considerable efforts have been devoted to develop new pedagogies to strengthen students’ concept learning. For instance, ConcepTests to enable educators to probe students’ concept learning in the classroom,2 incorporation of concept maps in organic reaction study,3 study of acid-base concept using Jigsaw,4 incorporation of mnemonic tool to learn tautomerization mechanism5 and so on. Recently, the incorporation of Interactive Anonymous Quizzes (IAQ) as the instruction of learning has shown positive outcome in students’ learning. The IAQ is a useful tool that enable educators to evaluate students’ understanding in concept learning. In IAQ, students’ concept learning was probed based on questions that are consists of multiple choice, as well as to enable students to review on previous lesson.6 In a large classroom setting, the lack of two-way communication between lecturers and students has affected the overall performance of students’ learning. Indeed, forming a good rapport between lecturers and students in the classroom leads to a better understanding, grades and satisfaction.7 In this instance, both the ConcepTests and IAQ are able to cater for this need to reinforce students’ concept learning and enhance interaction between lecturers and students. The implementation of new pedagogies that embedded with active learning component is imperative to energize students in their continuous learning in the subject taught.8

Lately, the authors has incorporated the Uncritical Inference Test (UIT) in the author’s basic organic chemistry course to enable student to study deeply a concept.9 As part of our continuous interest in researching for
concept-teaching activity, herein, we would like to report a simple and effective way of studying a concept which employ the use of IAQ with “must-have features” to enable students to study deeply the chemistry concepts in organic chemistry. The “must-have features” is defined as critical features that must be possessed by an item, in order for it to be classified as a member of a concept class. One of the sample of IAQ directed to students was shown in Figure 1. During this activity, students were allowed to discuss with peers around and they were required to submit their answers in the form of a write-up at the end of this activity. Overall, this activity has promoted several positive learning outcomes which was reflected in the students ‘reflective writing.

Research Methodology

This study was directed towards first year organic chemistry undergraduate students undertaking, semester 1 2015/16 who enrolled into the basic organic chemistry subject with two one-hour lectures per week in a total of 14 weeks.

Data Analysis

Students’ answers to the IAQ was graded carefully and analyzed according to the scoring rubric (Table 1) developed in the Chemistry ConcepTest. Students’ answers were graded as “Sound Understanding (SU), if their answers were correct and with no misconception. For answers that were correct, but displayed misconception were graded as “Partial Understanding containing misconception (PM)”. Finally, students’ answers that were incorrect and without explanation were graded as “No Scientific Understanding (NU)”. The rating scale were divided into three components, with NU = 0; PM = 1 and SU = 2.

Table 1. Scoring rubric of IAQ

<table>
<thead>
<tr>
<th>Degree of understanding</th>
<th>Scoring criteria</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>No scientific understanding (NU)</td>
<td>Response that provide incorrect answers or without explanation.</td>
<td>0</td>
</tr>
<tr>
<td>Partial understanding containing misconception (PM)</td>
<td>Response that provide correct answers but containing misconception explanation.</td>
<td>1</td>
</tr>
<tr>
<td>Sound understanding (SU)</td>
<td>Response that provide correct answers with no misconception explanation</td>
<td>2</td>
</tr>
</tbody>
</table>

Results /Discussions

During the initial phase of the individual study on IAQ #1 (Figure 1), about 12 % of the collected students’ answers were graded as “PM”, in which that wrote that the “must-have” feature for an organic compound was pharmaceuticals, while non-pharmaceuticals are inorganic compounds. In contrast, 86 % of the collected students’ answers were as “SU”, in which students correctly identified and written that the organic compounds are compounds containing carbon, while inorganic compounds are compounds containing element other than carbon. In contrast, 2 % of the students’ answers were remarked as “NU”, where students neither gave their answers or explanation in their answers’ script. The learning outcome of this activity was evaluated based on students’ reflective writing. The collected reflective writing was analysed carefully and a systematic network was built based on bloom taxonomy. The current activity was translated into a manuscript and is currently under the consideration for publication.

Contributions of the study

As a whole, the “must-have” IAQ in the context of basic organic chemistry serves to deepen students’ understanding about a concept, as well as to probe students’ misconception.

Conclusions

The IAQ activity was directed to students to understand deeper a concept. By learning the “must-have features” of a concept, students are able to effectively comprehend a concept and solve a given problem. In the future, the author would like to explore more concept teaching activity.
Figures/Display Elements

IAQ #1.

Determine which of the following that is not an organic compound? List the “must-have features” for organic and inorganic compounds.

Aspirin

Tamiflu

SiO₂

Sand

Acknowledgment (if any)

The authors would like to the students of Universiti Malaysia Terengganu for their participation in this activity.

References

A4

Embedding Digital Literacies in Curricula: Australian and Malaysian Experiences

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Abstract

The ubiquity of Web 2.0 technologies means students require a base level of digital literacies in order to succeed in 21st Century (C21st) learning environments. However, in the era of widening university participation it is problematic to assume that students will enter higher education with the digital literacies required to support their academic endeavours. This paper describes the theoretical and pedagogical impetus behind two distinct approaches to enhancing digital readiness among undergraduate students in Australian and Malaysian universities. A comprehensive literature review and adoption of the Joint Information Systems Committee (JISC) six capabilities of digital literacies model as the underlying theoretical framework guided the development of two distinct projects, one based at an Australian university and the other in a Malaysian university. The Australian approach focused on the development of a suite of online modules utilising an adaptive e-Learning platform (AeLP). The Malaysian approach focused on facilitating digital readiness among education students through student-created learning objects that simultaneously served as interactive pedagogical products and cognitive tools for facilitating learning. The cases presented demonstrate two distinct approaches to developing curriculum to support students’ digital literacies that respond to two different contextual situations. Subsequent investigations into the student experience will inform future decisions regarding the use of AeLPs and cognitive tools in tertiary institutions, in addition to providing valuable information on the design of curriculum to support digital literacies instruction in the Australasian university context.

Keywords: Digital literacies; Curriculum design, Higher education, Adaptive e-Learning, Cognitive tools

Introduction

The ubiquity of Web 2.0 technologies means students require a base level of digital literacies in order to succeed in 21st Century (C21st) learning environments. However, in the era of widening participation it is problematic to assume that students will enter higher education with the digital literacies required to support their academic endeavours (Kennedy, et al, 2009). Even students with high ICT skills “do not necessarily expect to use these technologies to support some activities, including learning” (Kennedy, et al, 2009, p.4). Consequently, it is necessary to develop pedagogical approaches to integrating digital literacies into curricula (Richardson, 2013). This paper describes the theoretical and pedagogical impetus behind two distinct approaches to enhancing digital readiness among undergraduate students in Australian and Malaysian universities. In the Australian context the approach consisted of an online digital literacies curriculum, authored using proprietary adaptive e-Learning software, and orientated towards digital literacies instruction among a multidisciplinary cohort of sub-
degree students. In the Malaysian context the project focused on student-created digital learning objects. Learning objects were designed by student teachers as cognitive tools to support learning and integrated into an education subject. Together these approaches demonstrate methods for developing digital pedagogies to enable success in technology-rich university learning environments.

Research problem

The importance of institutional support for students in the effective use of learning technologies is acknowledged in benchmarks set by the New Media Consortium (Johnson, Becker & Hall, 2015). However, diverse student cohorts result in variable levels of digital literacies in the classroom. Supporting digital readiness is one of the key challenges associated with teaching and learning in technology-rich environments. Consequently, this project seeks to answer the research question: How can literature on digital literacies inform the development of targeted curriculum support orientated around enhancing digital readiness for academic success in the higher education sector?

Objectives

The objective of this paper is to describe how a review of the literature has informed the design of two distinct approaches to embedding digital literacies instruction into university curricula. One approach is based at an Australian university and the other at a Malaysian university. These distinctive approaches demonstrate how digital literacies instruction can be tailored to suit specific cohorts and disciplinary requirements. Together, the cases illuminate the role interactive technologies can play in developing digital literacies and the manner in which research informed curriculum design can enhance student’s digital readiness.

Methodology

A literature review exploring definitions of digital literacies and research into digital readiness in Australian, Malaysian, and international contexts was completed. The literature review was complemented by a review of pedagogical approaches to e-learning design, exploring the intersections of authentic learning and the use of web 2.0 technologies as cognitive tools. The findings provided the theoretical, conceptual, and pedagogical impetus for individual campus teams in Australia and Malaysia to design their respective curriculum interventions.

Two different approaches, modelling distinct methods for digital literacies instruction, have subsequently been developed. The first approach consists of a suite of online modules, developed using an adaptive e-Learning platform (AeLP), that are currently being trialled at an Australian regional university within a bridging course designed to aid student’s transition into tertiary study. This open access course attracts a diverse array of multidisciplinary students and serves as a ‘stepping stone’ to Bachelor qualifications. The second approach is focused on facilitating digital readiness among education students, at a public university in Malaysia, through student-created learning objects that simultaneously serve as interactive pedagogical products and cognitive tools for facilitating learning. Together, these respective approaches show how digital pedagogies can enable the integration of digital literacies instruction into curricula.

Discussion

Throughout the design process, the Educating the Net Generation report and toolkit (Kennedy et al., 2009) was central to our understanding of digital literacies in the Australian context. Kennedy et al (2009) administered an “experiences with technology” questionnaire, followed by qualitative data collection, to further explore student experiences with technology. Key findings from the questionnaire indicate that: there is little empirical support for the rhetoric that university students are digital natives and university staff are digital immigrants; there is great diversity in student experiences with and preferences for the use of technology in higher education; and the data paints a complex picture of the technological experiences first-year university students bring to higher education (Kennedy et al, 2009, p. 3). These findings are confirmed in research conducted among Malaysian university students that similarly questions the classification of students as “digital natives” and highlights the complexity of students’ relationship with technologies (Shariman, Razak, & Noor, 2012).

Shariman, Razak, and Noor (2012) also identified some distinct themes with regard to Malaysian students’ engagement with digital resources that do not appear as prominently in the Australian literature, namely: English language difficulties, which prevent students from reading and critically responding to online content,
and a preference for immediacy that may lead to superficial engagement with online instructional materials. They also found that Malaysian students, particularly preferred multimodal content that contained both audio and video information (Shariman, Razak, & Noor, 2012).

In an international context, the US-based organisation, EDUCAUSE, also provided significant insight into the digital literacies of students. In 2015, their annual Study of Students and IT surveyed the digital literacies practices of 50,274 students (Dahlstrom, et al, 2015). Some key findings of the 2015 student survey were: students’ academic use of technology is widespread, but not deep; although omnipresent in students’ lives, leveraging technology as an engagement tool is still evolving; and students have a complex relationship with technology – they recognise its value but still need guidance in order to use it in meaningful ways. These findings confirm and expand on the outcomes of Australasian studies with regards to the lack of empirical support for the assumption that students are necessarily “digital natives”. However, international findings regarding the omnipresence of technologies should be viewed with caution. Shariman, Razak, and Noor (2012) and Kennedy et al (2009) both highlight the manner in which socio-economic status (SES) can impact access to digital technologies. Shariman, Razak, and Noor (2012) found that low SES Malaysian students primarily accessed the internet through university networks. These findings are mirrored among regional Australian students. In a university readiness assessment 40% of the cohort participating in the curriculum intervention described below reported having no internet access at home. Access to digital technologies is fundamental to the development of digital literacies and while universities can act as access hubs the literature indicates that guidance is necessary if students are to use digital technologies effectively for study.

Students require a base level of digital literacies in order to succeed in higher education; however, a definition of what actually constitutes digital literacies continues to develop. For example, Belshaw (2014) suggested that there are eight elements of digital literacies: cultural; cognitive; constructive; communicative; confident; creative; critical and civic. In earlier work, Lankshear and Knobel (2003) identified three dimensions: operational; cultural and critical. Operational literacies included competence with tools and procedures, while the cultural dimension was concerned with a person’s ability to understand text in its cultural context. Finally, the critical dimension was described as an awareness that literacies are socially constructed. As investigations into the nature of digital literacies have advanced, the UK’s Joint Information Systems Committee (JISC) have been instrumental in bringing together these differing definitions and creating a conceptual framework (JISC 2015) that describes the digital literacies necessary for student success. The JISC (2015) six capabilities of digital literacies model (Figure One) acknowledges that digital literacies are multifaceted – incorporating multiple aspects of literacies, and multiple literacies. The model identifies the variety of digital literacies that higher education students need to master – including: ICT literacies; information, data, and media literacies; digital learning and self-development; digital creation, innovation, and scholarship; and, identity and wellbeing. The comprehensive, yet flexible nature of this model resulted in its selection as an underlying theoretical framework for the development of the adaptive eLessons and student created learning objects described below.

Adaptive e-Lessons

The e-Lessons, utilised in the Australian context, use an adaptive e-Learning platform (AeLP) to contribute a reusable technical solution to the challenges associated with digital literacies instruction among diverse cohorts in non-computer science based disciplines. In doing so the lessons build on findings from the 2007-2012 Adaptive Mechanics project, which demonstrated the capacity of adaptive tutorials (ATs) to improve student learning outcomes and comprehension of threshold concepts in first year engineering subjects (Gangadhara Prusty, et al, 2013). The Adaptive Mechanics project identified a positive correlation between the use of adaptive tutorials, student outcomes and course satisfaction, as well as showing reductions in failure rates and significant improvements among underprepared students. The adaptive digital literacies lessons build on these successes.

The lessons follow the narrative of a simulated group project, during which students direct virtual group members (henceforth referred to as non-player characters, or NPCs) through a series of research and data analysis activities culminating in the creation of a faux research poster. In accordance with the lesson narrative, each of the NPCs embodies specific strengths and common misconceptions. The student completing the simulation subsequently has to negotiate with their NPCs to solve a series of challenges orientated around information, data, and media literacies. The lessons were integrated into an introductory transition subject for non-IT students. The adaptive platform provides students with personalised feedback and personalised learning experiences in an authentic context.
Student created learning objects

In the Malaysian context, student teachers were required to participate in a learning task that asked them to create digital learning objects for use in teaching secondary school chemistry classes. The integration of this project into an existing education curriculum provided student teachers with the opportunity to enhance their IT, digital media and design skills, while concurrently building their ability to select appropriate media for use in teaching chemistry (P21, 2007). The task began with explicit instruction on the IT skills required to develop the digital objects. Students then translated their understanding of a chosen chemistry content area into a digital presentation to be used as a cognitive tool for learners in secondary schools. Cognitive tools are computer-based tools that can be used to provide students with C21st skills, such as problem solving, and help them become life-long learners (Bransford, Brown, & Cocking, 2000; Jonassen, 1996). A key aspect of the task asked the student teachers to design the digital learning objects in a way that could be easily understood by their learners. Students utilised Microsoft PowerPoint, Adobe Flash, or iSpring to design learning objects that contained interactive elements. The design of this task exemplified the use of technology as a cognitive tool that can support student teachers to develop their abilities to present information in a meaningful way (Jonassen & Reeves, 1996). In addition, the students learn the design and IT skills associated with producing a cognitive tool for learning, thus, contributing to the development of their own digital literacies. When mapped against the JISC (2015) six capabilities model student teachers are developing digital learning and self-development, digital creation, innovation, and scholarship, and ICT proficiency Furthermore, the project integrates a self-assessment and reflection component that facilitates improvement of the digital object they have produced.

Contributions

The two case studies presented in this paper demonstrate how literature on digital literacies can inform the embedding of digital literacies instruction into university curricula. In the Australian case, an AeLP was used to combine processes of explicit instruction, active learning, and personalised feedback into a suite of stand-alone lessons that can supplement existing subject content. In the Malaysian instance, processes of digital learning and self-development were implicitly integrated into an existing curriculum through an IT-orientated project that utilised digital technologies as cognitive tools to enhance student learning. Together, these cases illuminate the role interactive technology can play in developing digital literacies and the manner in which digital literacies instruction can be tailored towards institutional, cohort, and disciplinary contexts. Giving students the opportunity to work creatively with digital learning objects (either as content users or creators) can provide structured support that is adaptable to individual learning levels.

Conclusion

Digital literacies are increasingly being recognised as a key attributes that students must develop in order to succeed in tertiary education and employment. Research suggests that digital literacies instruction is necessary and that the rhetoric of ‘digital natives’ is not helpful when it comes to supporting students. Learners need support for developing transferable digital literacies that can be used in academic and professional environments. In order to support this JISC (2015) has provided a model that can be readily adopted and deployed in curriculum development. The cases presented in this paper demonstrate two distinct approaches to developing curriculum to support students’ digital literacies that respond to two different contextual situations. In the first case through the use of an AeLP to provide explicit online instruction and in the second case through project based learning using digital technologies as cognitive tools. Subsequent investigations into the student experience will inform future decisions regarding the use of AeLPS and cognitive tools in tertiary institutions, in addition to providing valuable information on the design of curriculum to support digital literacies instruction in the Australasian university context.
Figures

![Six capabilities model of digital literacies (JISC, 2015).](image)

**Figure 1:** Six capabilities model of digital literacies (JISC, 2015).

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**References**


Factors Affecting University Students’ Satisfaction on Online Learning System

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Abstract

This paper examines several internal and external factors affecting university students’ level of satisfaction towards online learning system. Field data collected from 282 students from one of the local management university. Data were analyzed using multiple regression analysis. The outcome of the analysis suggests that the proposed factors are vital predictors for students’ level of satisfaction in using university’s online learning system.

Keywords: interaction, internet self-efficacy, online-learning, self-motivation, satisfaction

Introduction

This study focuses on the examination of several internal and external factors that influence students’ level of satisfaction towards online learning system. To date, there has been plenty of research discussing about satisfaction towards online learning. These studies however, are limited only towards examining the satisfaction of students in relation to their experience of going through an online class.

There has been limited study looking into the students’ satisfaction toward the system that was used during their enrollment in a particular online course. Build on prior literature, this study proposed a research model that examines both the effect of internal factors (internet self-efficacy & selfmotivation) as well as external factor (interaction) of students’ characteristics on their level of satisfaction towards the online learning system.

Research Problem

Rapid acceleration in technology has revolutionized traditional learning methods into an entirely new educational platform and industry. These new technologies have profoundly enhanced learning experiences for both students and instructors with an array of tools to facilitate engagement and motivation.

Traditional face-to-face education is no longer to be considered as the only way to transfer knowledge (Hiltz & Turoff, 2005). Studies reveal that there is a growing tendency towards enrolling in internet classes because of its simplicity and benefit (Eom, Wen & Ashill, 2006; Allen & Seaman, 2010).

The simplicity and convenience of online learning, nevertheless, does not come without a price. Billions are spent on building the systems that facilitate online learning. Notwithstanding the total amount of time plus money spent in developing the system, it does not necessarily justify success, thus causing vast quantity of losses. Given such consideration, it seems that constructing a great online learning system is no more inescapable.

To measure the effectiveness as well as the usefulness of online learning system that warrant the success of online learning system implementation, Alavi, Wheeler & Valacich (1995), as well as Graham & Scarborough (2001) articulate that it is crucial to evaluate the level of its users’ satisfaction.
Amidst the existence of a plethora of evidence documenting students’ satisfaction towards online learning, such investigations only recorded on limited study area such as the content of the online learning courses (i.e. the perception towards the content of the course and the perception towards the structure of the course and how it affects the students’ satisfaction). For this reason, this study will focus on a crucial issue such as student’s level of satisfaction towards the online learning system based on both internal and external factors, which have not been explored yet.

**Objectives of the Study**

The objective of this study is to examine a regression model for students’ satisfaction towards online learning system involving student characteristics (interactions, internet self-efficacy and selfmotivation). The proposed research model for this study, is founded upon two earlier studies on online learning satisfaction by Kuo, Walker, Schroder & Belland (2014) and Eom et al., (2006). Both studies examined the level of satisfaction towards online learning. This study however, will examine the level of students’ satisfaction towards the online learning system.

Specifically, this study would like to achieve the following objectives:

i) To determine that interaction influences the satisfaction towards online learning system  
ii) To determine that internet self-efficacy influences satisfaction towards the online learning system  
iii) To determine that self-motivation influences the satisfaction towards the online learning system.

**Research Methodology**

This study was conducted using undergraduate students from one of the local management university in Malaysia. Judgmental sampling was used such as that students who are eligible to respond to the questionnaire must be at least second year students. The underlying reason for such method is that these students had been exposed to at least, a one-year experience in using the university’s online learning system. Hence, these students are deemed to be good enough to provide their thoughts and perception on the use of the university’s online learning system.

Online questionnaires were used to collect data from the target respondents. Students that were keen to participate in this survey were given the URL link directing them to the online questionnaire website. Answers were made compulsory in such a way that without completing the questions in a particular page, students were not allowed to proceed with the rest of the survey. Given in this way, missing data was not an issue.

The instruments used for this study derived from past literatures. Interactions were measured using a three dimensional scale developed by Kuo et al., (2014) which consisted of learner-learner interactions (4 items), learner instructor interactions (5 items), learner-content interactions (3 items). All three dimensions achieved satisfactory reliability score of 0.731, 0.786 and 0.794 respectively. The summated score of all three dimensions was used for subsequent analysis.

In a similar vein, internet self-efficacy was measured using a 5 items measure developed by Kuo et al., (2014) while self-motivation was assessed using a 2 item measure developed by Eom et al., (2006). Both measurements achieved good reliability scores of 0.839 and 0.732 respectively.

Online learning system satisfaction, on the other hand, was measured using a 4 item measures derived from prior literature (Kuo et al., 2014 & Eom et al., 2006). The reliability score of the measure was 0.812.

SPSS was used to assess the aforementioned objectives. Specifically, Pearson correlation and multiple regression analysis were conducted to assess the proposed relationship.

**Results /Discussions**

Prior to assessing the relationship between each of the construct, we conducted Harman’s one single factor test to address the issue of common method variance (CMV). The Harman one single factor test yields a result of 29% of variance explained for the first factor. This percentage is lower than the threshold value of 50% indicating that common method variance is not an issue in this study.
Pearson correlation analysis was then conducted to assess the association between each respective construct. Results from the analysis suggest that each of the constructs are significant associated with one another. Internet-self efficacy is moderately associated with student satisfaction ($r = .461$). In the same vein, both interaction ($r = .64$) and self-motivation ($r = .523$) are found to be moderately associated with student satisfaction. Given that the association between respective construct is not high, it can be assumed that multicollinearity is not an issue in this study.

Results from multiple regression analysis suggest that the three predictors namely interaction, internet, self-efficacy and self-motivation explained 45% of variances in student satisfaction. Self-motivation ($\beta = .176$, $t = 3.303$), internet-self efficacy ($\beta = .131$, $t = 2.425$) and interaction ($\beta = .463$, $t = 7.741$) are found to be significantly associated with student satisfaction indicating that all the three predictors are focal constructs in determining student satisfaction towards an online learning system. Among the three predictors, interaction was found to have the largest effect over student satisfaction followed by self-motivation and internet self-efficacy.

**Contributions of the study**

This study contributes to the body of knowledge in several ways. First, this study provides an assessment on the factors influencing students’ satisfaction towards online learning system. The use of both internal and external factors in the context of this study provide insight to the system developers such that while it is important to develop a good online learning system, the provider and developer of the system should show discernment especially towards student’s ability in utilizing it.

Systems that are too advanced might be a major issue for students who have low self-internet efficacy. To some certain extent, pupils with low self-internet efficacy may be unable to perceive the usage of specific complex functions embedded in utilizing the online learning system in the system which subsequently, leads to discouragement.

On the other hand, it was found that the level of satisfaction of students towards the online learning system is associated with the level of interaction that a student encounter while engaging with the online learning system. Notably, interesting functions and content available on the online learning system as well as proactive interaction between learners and instructors through optimizing use of the function available in the online learning system would warrant student satisfaction. The access to audio and visual support executed in the online learning system will lead to excitement in utilizing the online learning system as an instrument to transfer knowledge. These virtual classrooms will allow students to experience real life classroom situations along with their instructors with the aid of such tools. As such, this will invariably enhance students’ level of satisfaction towards online learning system.

Subsequently, we also found that students’ selfmotivation does influence their level of satisfaction towards the online learning system. A traditional assumption of motivation is viewed as self-determined and the level of engagement a student has with a system depends solely on that. On the other hand, the level of satisfaction a student has towards online learning system depends on their motivation to be engaged. Therefore, it is in the best interest for academicians to have a role in ensuring that students are exposed to the benefits of using online learning system in the most effective way. Such exposure will in turn facilitate students’ motivation and interest towards using the system.

Institutions who are in the midst of implementing a platform for online learning, the findings of this study provide valuable insights into the way students’ behavior towards online learning system is potentially influenced by their characteristics. The success of implementing an online learning system in education institutions should be in accordance with student’s perception towards using a platform based on several mitigating factors. The proposed system should match the students level of internet self-efficacy. Hence, it is advisable that when deciding to implement the online learning system, it would be best to re-look at what is the perception of the students about the soon-to-be implemented online learning system. Matching the level of complication of the system alongside with the level of internet-self efficacy of the student as well as monitoring the motivation of the student towards the online learning system and the expectation towards the type of interaction that are to happen when using the online learning system would warrant the success and satisfaction towards the online learning system.
Conclusions

This study proposes a model that looks into mitigating factors that warrant students’ satisfaction towards online learning system. Overall, all the proposed relationships were found to be significant, indicating the importance of considering these factors. Since students are to be considered as the utmost important user of the system, it is important to revisit the determinants of their satisfaction towards the online system. The ability to identify factors determining their level of satisfaction is crucial as this will lead to the overall implementation success of the online learning system. The findings of this study will also provide relevant information for institutions to eliminate online learning systems that are deemed to be ineffective and implement one that is of value.

Figures/Display Elements

Figure 1. Research model of the study

References


Use of Ipads for Mastery of 21st Century Skills

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Abstract

This study investigates the effectiveness of mobile technologies, in particular, the iPad in assisting learners to master 21st century skills such as critical thinking and problem solving, collaboration, communication, initiative and self-direction as well as digital literacy in preparation for their eventual entry into the workforce. A questionnaire involving both Likert scale and open ended type of responses was deployed in this study to collect data from a cohort of 46 students in the Monash University Foundation Year (MUFY) programme in Sunway College Johor Bahru.

Keywords: 21st Century Skills; Collaboration; Critical Thinking; Digital Literacy; iPads; Job Readiness

Introduction

As educators, our aim when teaching every group of students that comes under our care is not only to ensure they pass their exams, or enter university, but ultimately that they will go on to be successful in their chosen careers. Yet, studies have shown that there is a wide gap between the knowledge and skills students learn in school and what they need in a typical 21st century workplace. This means that the education industry now faces a great challenge to bridge that gap as job readiness in this current Digital Economy is not just about the traditional core subjects and skills such as reading, writing and arithmetic, but is associated with the mastery of 21st century skills (Kivunja, 2014b).

The 21st century skills we hope to instil in our students are in the domains of learning and innovation skills (LIS), career and life skills (CLS) and digital literacy skills (DLS) as outlined by Trilling and Fadel (2009). Among the skills in the abovementioned domains, we have chosen to focus on critical thinking and problem solving, collaboration, communication, initiative and self-direction as well as information, communications and technology (ICT) literacy as suggested by Kivunja (2014b).

One important tenet of the 21st century skills is critical thinking and problem solving. Kivunja (2014a) asserted that critical thinking skills can be taught when educators use powerful technologies available today. Thus, the introduction of iPads into the course will introduce critical thinking skills, as educators can better prepare students for the world of industry and innovation (Saavedra & Opfer, 2012).

Communication and collaboration are skills that enable students to articulate thoughts and communicate both visually and through text in a collaborative environment (Hummell, 2016). The use of iPads in the classroom enhances collaboration and sharing amongst the students especially with the proliferation of mobile apps programmed for cooperative use. With the iPad, students can build and connect ideas, debate and share information quickly and efficiently (Rossing, Miller, Cecil & Stamper, 2012).

Next, a learner who has initiative and is self-directed is able to manage goals and time, work independently and go beyond mastery of skills to expand learning and explore opportunities to gain expertise (Partnership For 21st Century Skills (P21), 2015). Tucker (2014) elaborates that a technology enriched learning environment would enable students to manage their own learning, and to assess their own progress. This is supported by the findings in P21(2016) that productivity and personal development tools like calendar, e-learning and collaboration tools will enhance personal initiative and self-directional skills.
Finally, to be ICT literate, a learner needs to understand how to use 21st century technology tools including computers, networks and mobile technologies to research, organize, evaluate and communicate information. The effective use of 21st century tools would also improve critical thinking and problem solving skills besides increasing initiative and self-direction (P21, 2016).

To succeed in this fast paced world of change, the mastery of the 21st century skills is of utmost importance and must be taught in schools (P21, 2016). Triling and Fadel (2009) also argued for need to use technologies such as iPads in education so our learners can become critical thinkers and problem solvers besides acquiring the essential skills that will propel them to success in their chosen fields. As part of our effort to prepare students for their future careers, Sunway College Johor Bahru launched our inaugural iPad project in the hopes that it would enhance the mastery of 21st century skills required for success in the workforce.

**Research Problem**

This research aims to provide an understanding on whether the use of iPads in the classroom assists students in mastering 21st century skills required for them to succeed in the workforce upon completing tertiary education.

This study involves learners in the Monash University Foundation Year (MUFY) programme; a 10-month bridging programme which prepares secondary school students for tertiary education. The iPad pilot project is implemented for this group of students because the ‘MUFY graduate attributes’ as outlined in the Teaching and Learning Guide for all MUFY subjects explicitly highlights the need for the students to be equipped with digital literacy skills when they complete the course.

**Objectives of the Study**

This study sets out to uncover whether the use of iPads has been beneficial for learners in preparing them with the essential skills for their future careers, and if so, specifically in what areas has it proven to be most effective. The areas of study are divided into 5 major sections corresponding to the 5 types of 21st century skills as seen below:

- Section 1: Critical Thinking and Problem Solving
- Section 2: Communication
- Section 3: Collaboration and Teamwork
- Section 4: Initiative and Self Direction
- Section 5: Information, Communication and Technological (ICT)

**Research Methodology**

46 students from the July 2015 intake of the MUFY programme are chosen as the respondents of this research, being the first batch of students involved in the pilot iPad project. Students were asked to complete a survey which included Likert-scale type questions and questions requiring open ended responses after using the iPad for 9 months. This concurrent mixed method approach allowed for the collection of both qualitative and quantitative data.

The questions were divided into 5 major sections mentioned in the objectives of the study. Each major section comprises three to five questions and the students were required to score each of the questions. The students were asked to recall their learning experience prior to using the iPad as compared to the current experience in the iPad pilot project and their feedback is then collated.

The survey was created and administered using SurveyMonkey, a free cloud-based online software. The respondents were requested to use their mobile devices to access the questionnaire and post their responses.

**Results/Discussions**

Survey responses were collected from all 46 students who were involved in the inaugural iPad project, thus giving us a 100% response rate. The students’ responses to specific questions in each major section of the survey revealed several interesting insights.
In Section 1: Critical Thinking and Problem Solving, respondents were asked if they agreed to these statements:

a. I can better figure out how to use data and ideas to solve problems or complete assignments with the use of iPad.
b. I can better use formulas or concepts accurately to solve new problems or new situations with the use of iPad.
c. I can see issues from multiple points of view more clearly with the use of iPad.
d. I can create a conclusion that is logical and which reflects my own ideas better with the use of iPad.
e. I can link ideas together in complicated patterns and explain complex relationships better with the use of iPad.
f. In general, it is easy to see how the usage of the iPad has equipped me with the critical thinking and problem solving skills.

Overall, 71% of the respondents have indicated that it is easy for them to see how the iPad has helped them in improving their critical thinking and problem solving skills especially when linking complicated patterns and explaining complex relationships. Many attributed this improvement to the ability to search for information instantly through the internet. After obtaining multiple pieces of information, the students would continue to decipher and filter the information to solve a problem.

Only 56 per cent responded that the iPad helped them with making logical conclusions whereas more than 60 per cent said with the use of iPads, they could better use formulas or concepts to solve problems, other than having better clarity of issues from multiple points of view.

As for Section 2: Communication, the respondents were asked to rate their agreement to these statements:

a. The use of iPad motivated me to interact more with my peers and/or lecturers.
b. The use of iPad enables me to participate more actively in class discussions.
c. The use of iPad gave me confidence to give comments and provide feedback to peers and/or lecturers.
d. Overall, the iPad has proven to be a good channel of communication between my peers and lecturers.

All four questions garnered more than 70 per cent agreement from the participants, with 82 per cent affirming the iPad as a good channel of communication for them. Moreover, 86 per cent have indicated that the use of iPads served to motivate them to interact more with peers and lecturers, while almost three quarters of the respondents agreed that using iPads helped to boost their confidence in giving feedback or comments.

With the use of instant feedback apps like Socrative and Plickers on the iPad, students are able to ask questions without interrupting the lesson while receiving immediate feedback on their response. This motivates the students to instantly learn and relearn while participating in the activity itself.

Next, the statements included in Section 3: Collaboration are as seen below:

a. I work better in a team with the help of the iPad.
b. The collaboration process is easier and more convenient using the iPad.
c. With the usage of the iPad, collaboration and teamwork is greatly enhanced.

This section, unsurprisingly, had the highest percentage of agreement among all the sections. With the extensive use of cloud based applications such as OneNote and OneDrive, 90% of the students testified that with the iPad, collaboration and teamwork among themselves have been made easier and more convenient. The use of cloud functions enables many users to work on the same shared file/document whilst still at their own remote stations. Students are also able to submit their work to the teacher for instant feedback.

Section 4: Initiative and Self Direction then follows, and the statements are:

a. I am better able to manage my goals with the iPad.
b. I am better able to manage my own time/deadlines with the iPad.
c. I am encouraged to work independently and be a self-directed learner with the iPad.
d. With the iPad, the responsibility of learning now lies not only on the lecturer, but on me.

This section turned out to be the lowest scoring area with only about 62% of agreement overall. Just slightly over half of the respondents felt that the iPad assisted them with managing their goals. It is likely that students...
had set unrealistic goals and hence failed to meet the deadlines. More than 70 per cent however, acknowledged that the use of iPads shifted the responsibility of learning to them. The reasons for this is that with the iPad, the students are now required to actively download materials from the e-Learning platform or complete research projects after school hours.

Although not a significant majority, 6 in 10 respondents felt that the use of iPads did help with time management and independent learning. With as many as 4 assignments to complete in a week, many have responded that setting reminders on their iPads and using the calendar function improved their time management.

Finally, Section 5: Information, Communication and Technology asked for responses to these statements:

- a. I am able to access and evaluate information better with the use of iPad.
- b. I am able to manage the flow of information and use information accurately with the use of iPad.
- c. I am more confident in using technology in my learning after using the iPad.

With regards to the improvement of ICT skills, 90% of the students have attested that with the iPad, they were able to access information more easily. Almost 80 per cent also indicated that the use of iPads increased their confidence in using technology and in managing information flow accurately. In most cases, students have responded that the use of iPads have improved their confidence in graphing, performing complex calculations, creating and delivering presentations besides enabling them to access cloud functions, Microsoft online apps, sharing of files, to name a few. There were also students who stated that they are much more ICT savvy now as they knew almost nothing about it prior to joining this pilot project. This is indeed a testament of how the introduction of iPads enhances the ICT skills of students.

To sum up the results across the sections, the average percentage of agreement for each section is shown in the table below.

<table>
<thead>
<tr>
<th>21st Century Skills</th>
<th>Average percentage of agreement for all items in the same section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical Thinking and Problem Solving</td>
<td>65.5</td>
</tr>
<tr>
<td>Communication</td>
<td>79.2</td>
</tr>
<tr>
<td>Collaboration and Teamwork</td>
<td>83.7</td>
</tr>
<tr>
<td>Initiative and Self Direction</td>
<td>61.6</td>
</tr>
<tr>
<td>Information and ICT</td>
<td>82.2</td>
</tr>
</tbody>
</table>

Finally, the respondents were asked to respond if they would continue to use the iPad in their future learning and whether they would consider this inaugural iPad project a success. Both questions were answered with an unequivocal YES from participants of the survey. Among the reasons that motivated them to respond this way is that with the iPad, students have the accessibility and the freedom to work with a piece of work anywhere and at any time.

Thus, it is clearly shown that the students have a generally positive perception of the usage of iPad in the class as a means of improving their 21st century skills.

**Contributions of the study**

This study provides some feedback from learners gathered from the survey data with regards to the benefits of using iPads for the mastery of 21st century skills. We do acknowledge that the nature of this study is similar to other available resources currently as most information about mobile learning infusion comes from evaluation reports relying heavily on perception data and student self-reports. Despite a seemingly large body of literature relating the use of iPads to the increase in 21st century skills amongst students, few studies are actually published in refereed outlets (Warschauer, 2006 as cited in Hargis, Cavanaugh, Kamali & Soto, 2013). This study is not an exception as the mastery of skills cannot be measured by just a questionnaire.

To determine the effectiveness of technology in the classroom, a control group is required together with validated instruments and must be implemented in a wide scale over decades. To this point, the measures of
teaching practice in mobile learning environments is not available (Hargis et al., 2013). In addition, the sample size is relatively small as the analysis involved only one pilot class. These findings however, do illustrate some interesting relationships beckoning future research and the data collected adds to the existing body of works on the effectiveness of using iPads in the classroom.

Conclusion

Faculty, leaders and teachers should value the benefits of integrating mobile technology in the classroom not only as a means of improving the 21st century skills but also to increase student motivation, engagement and other affective traits. It is also our belief that the inaugural iPad project is a success as 100% of the respondents have indicated that they will continue to use the iPad for learning in the future. Finally, in the students’ perception, the usage of iPad helps them with the mastery of the 21st century skills and this would prepare them better for their tertiary education and eventually to be successful in the workforce.

References

The Effects of Social Network on Student Learning Experience.

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Abstract

The practice of using social technologies for teaching and learning is gaining more prevalence in higher education. In particular, online social networking (OSN) activities, including content generating, sharing, interacting and collaboratively socialising, are enabled by social technologies. Blogs, wikis, social networking sites and podcasts, just to name a few, are entering mainstream adoption and no longer considered as hype. However, using these technologies to keep students engaged with the content, their learning activities and actively interacting among themselves is still a challenge for many academics. We conducted a study involving students in a Malaysian university, to discover how social technologies can be leveraged to enhance student engagement and interaction. The data were obtained from three focus groups conducted in a university and each focus group comprises of 5 to 8 students. The aim of the focus group discussion was to explore students’ experiences of using social technologies. The data analysis obtained insights into students’ perspective on the impact of social technologies on their engagement and interaction in the learning process.

Keywords: Online Social Networking (OSN), Engagement, Interaction.

Introduction

The online social networking (OSN) educational activities are becoming more common as higher learning institutions are now showing considerable interest to the use of social technologies for educational purposes (Mason & Rennie, 2008; Hughes, 2009; Kear et al, 2010). OSN is defined as a range of activities enabled by social technologies and operationalised by a group of people (Hamid et al, 2009).

Research Problem

Social technologies referred to in this paper include blogs, microblogs, wikis, social networking sites, video sharing sites, and online discussion boards or forums. The OSN educational activities that are enabled by social technologies include those of content generating, sharing, interacting and collaboratively socialising (Hamid et al, 2010). There have been a number of studies exploring the use and benefits of OSN for educational purposes (Ajjan & Hartshone, 2008; Arnold & Paulus, 2010; Techehaimanot & Hickman, 2010; Ferdig, 2007; Kabilan et al, 2010). These studies have identified a number of benefits of OSN which include increased student interactions with other students and their lecturers, increased students’ satisfaction with the course, and improved students’ learning and writing ability. The affordance of social technologies in supporting better student engagement and interaction has also been acknowledged in some studies (Maloney, 2007; Ajjan & Harshone, 2008; Odom, 2010; Roblyer et al, 2010). Nevertheless, there have also been failure cases identified where benefits (Cole, 2009). Moreover, while the past studies pertaining to OSN use from the students’ perspective are all relevant and useful in furthering our understanding of OSN use phenomenon, many studies do not employ any theoretical lens (Maloney, 2007; Techehaimanot & Hickman, 2010; Odom, 2010). Those studies with theoretical base, generally discuss the phenomenon from the lens of learning theories (Cole, 2009; Kabilan et al, 2010; Ferdig, 2007), pedagogical approach (Arnold & Paulus, 2010; Roblyer et al, 2010), and the theory of planned behavior (Ajjan & Hartshone, 2008; Zakaria et al, 2010). In addition, the existing literature has not specifically discussed the elements, processes or the dynamic interactions involved in making engagement and interaction occur as part of students’ use of OSN for their learning.
Objectives of the Study

In this research context, we will situate and frame the students’ use of OSN on 3 areas which are subject, community and rule on the effects of these areas.

Research Methodology

The data for this research were collected using qualitative method by conducting three focus group discussions in a Malaysian university in April 2011. The study has gained the human ethics clearance from the researcher’s university. Invitations containing the intention of the study and the plain language statement were sent out to lecturers’ email who had also participated in the previous phase of this research (i.e. interviews with the lecturers in order to gauge the lecturers perspective of OSN use for higher education, reference is withheld for the review process), requesting them to advertise to their students for voluntarily participation. Students who agreed to volunteer were sent the detailed arrangements for the focus group. The focus group took around 1 to 1 ½ hour each. The sessions were held at the students’ university, and mostly conducted in the room equipped with computers and Internet connection. In all cases, the sessions were held without the presence of their lecturers. Permissions from the students were sought to audio-taped the discussion which later were transcribed manually. The lead researcher facilitated the session by adhering to the prepared focus group discussion protocol. The students were asked several questions, centered on three main issues: their personal and educational use of OSN; the activities and experience of OSN use in classroom – focusing on the interaction; and the outcomes which include the benefits, challenges and opportunities of OSN use. Regarding the study context, there are two main motivations for conducting this research in the localised context of Malaysia. Firstly, the principal researcher has a better understanding of the context as her background is of Malaysian-based. Thus, understanding the culture, social values and language provide the researcher a better engagement with the research context and a deeper association with the research participants. Secondly, Malaysian higher education has started to adopt OSN on a wider scale and young Malaysians are very active users of OSN (Zakaria et al, 2010; Kabilan et al, 2010). Therefore, the Malaysian context offers a good opportunity to explore the phenomenon investigated in this study. The courses where the students use the social technologies are generally the kind of introductory course on ICT in the context of teaching and learning English (i.e Computer Application in English Language Teaching, and English as Second Language Classroom, Resources and Technology).

Results/Discussions

Subject:

The data related to the Subject construct can be linked to the main actor, namely the students. We discussed the Student subject from the characteristics of the students, whom we can classify as techno-savvy and early adopter. In our study, the use of social technologies for either personal or educational purposes, we found only three out of eighteen students claimed that they were beginners in using such social technologies. Another three claimed they were quite skillful in the use of social technologies and the majorities were average users in terms of social technology skills. For the students who exhibited a techno-savvy characteristic, one of them aimed to use it in the future when she becomes a teacher after graduating from the programme.

It is also noted that the students are early adopters of social technologies as most of them claimed to have used the social technologies for personal use prior to their studies at the university. The tools mostly used by them for socialisation with family and friends include Facebook, Twitter, Youtube and blogs. The students also have preference in the choice of social technologies used although they have no direct influence over the selection of social technologies used by their lecturers for the teaching and learning purposes. From the data, most of them are very familiar users of Facebook having used other social networking sites before such as MySpace and Friendster. However, one of our participants, an international student from China had only started using Facebook as the use of Facebook, is banned by the Chinese government.

Community:

The community in the activity systems of students’ use of OSN includes the interaction among the subjects, namely student-student, student-lecturer and student-technology. Under the student-student interaction, the community is built as the result of interaction among students with their course mates.
For the interaction between student and lecturer, the interaction level was said to be of lesser degree. This is because the interaction is less frequent compared to student-student interaction. It is understandable as the lecturers are generally acting as the facilitator, monitoring in the periphery and thus, entrusted the students to communicate among themselves in their quest of ‘knowledge construction’.

**Rules:**

In our study, we found the lecturers would define a set of rules to be adhered by the students. However, in some cases, the rules were not specifically mentioned as the lecturers were using the OSN only as supplementary tool (refer discussion on tool and artifact above). In our previous work, the lecturers would state the inclusion of OSN use in their course syllabus before the semester started or would give briefings during the first contact hour in the semester (reference is withheld for the review process). In some cases, lecturers allocated a certain percentage of marks for OSN activities in the coursework. The rubrics prepared allowed the students to know what they were expected to do and achieve at the end of the semester, particularly those relating to OSN use (reference is withheld for the review process).

Additionally, the engagement and interaction level of the students with their peers and the course is stated in the course expectation, contained in the rubric. For example, the course rubric stated that the students would be assessed continuously as part of their use of OSN and their collaborative works with the other students.

**Conclusions**

In this paper, we have investigated the impacts of the use of OSN on enhancing student engagement and interaction from the students’ perspectives. To guide the analysis of the empirical data, the constructs of Activity Theory were employed to help us explore systematically the dynamic interactions involved among students and the lecturers as they use social technologies for OSN activities as well as identify benefits and challenges experienced by the students in the use of OSN. Our preliminary findings show that the participating students were techno-savvy and early adopters of social technologies. This finding concurs with the study by Zakaria et al (2010) which highlight Malaysian’s students wide exposure to the social technologies which makes them reasonably comfortable in using these technologies for educational purposes. We also found that there are a number of social technologies used by the students for both personal and educational purposes. Most of the students who participated in the focus group discussions showed positive inclination towards the use of OSN in facilitating their learning, although there were some concerns raised by the students. The affordances of the social technologies benefited the students in enhancing their engagement and interaction, in promoting critical thinking, discovering new knowledge, tracking their own learning progress and being a platform to be more vocal. In today’s changing educational landscape, in particular in the countries with the culture of students preferring to be “spoon-fed” (Ziguras, 2001), we believe that the use of social technologies, to some extent could change this traditional practice of spoon-feeding to those of student-centered. In addition, we have identified a number of challenges that include time management issue, lack of ICT skills faced by some students and limited technical infrastructure in some higher learning institutions. There are also opportunities to be reaped from OSN use that offer the students the much needed improvement in their soft skills and in getting them ready for a techno-savvy workforce of the future. This study offers important implications to both theory and practice. From the theory perspective, the research contributes in demonstrating the usefulness and applicability of the Activity Theory in understanding the phenomenon of OSN use by students for enhancing their engagement and interaction. From the practice perspective, the findings reported in this paper can be used by practitioners especially lecturers in higher education and even teachers at all levels (primary and secondary levels) in inspiring them into harnessing the social technologies in their quest to enhance their students’ learning experience. There are a number of limitations of this study that offer opportunities for future research. Firstly, the insights obtained are considered as skewed to the perspective of the students only.

However, understanding the perception of students is indeed valuable since arguably students are the most critical stakeholders in this context of research. In addition, this study complements our previous study that explores the perception of the lecturers (reference is withheld for the review process). Thus, future research could be conducted to compare the insights obtained from the perspective of students and lecturers, as well as to explore other stakeholders’ perspectives regarding the use of OSN for higher education. Such richer data would provide us with a more comprehensive understanding of the phenomenon and therefore, provide the practitioners and researchers with better insights into how social technologies can be best leveraged for higher education.
References


Initial Considerations for Transnational Education Providers Regarding the Mapping of the East African Qualifications Framework to the European Qualifications Framework

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Abstract

The East African Qualifications Framework for Higher Education (EAQFHE) is the latest in a number of regional frameworks of qualifications that have been developed this century. As with other regional frameworks, such as the Qualifications Framework for the European Higher Education Area (QF-EHEA) which emerged from the Bologna process, and the European Qualifications Framework for Lifelong Learning (EQF), the key objective of the EAQFHE is to enable mobility and harmonisation among the various jurisdictions which it covers. Mapping exercises between local and regional qualifications frameworks enable providers and stakeholders in different jurisdictions to engage in a process where they examine the type and level of awards made in those jurisdictions, with a particular focus on the compatibility and alignment of awards. This paper looks at the specific case of transnational education (the provision of education across borders) and argues for the need to incorporate additional considerations into any such mapping exercise. These considerations must account for the local linguistic and cultural expectations attached to awards, such that providers in different jurisdictions have an explicit understanding of what would otherwise be an implicit and perhaps inconsistent understanding of the nature and type of a particular award. This paper makes specific recommendations relating to transnational education involving the European and East African regions ahead of any formal mapping exercise between the EAQFHE and the corresponding European frameworks of qualifications, the QF-EHEA and the EQF.

Keywords: International Education, Quality Assurance, Transnational Education

Introduction

The mapping of qualifications frameworks enables a shared understanding of qualifications and the achievement of learning across boundaries. Regional qualifications frameworks such as the Qualifications Framework for the European Higher Education Area (QF-EHEA) and the European Qualifications Framework for Lifelong Learning (EQF) have been developed in recent years through an analysis of qualifications in multiple jurisdictions in Europe and an agreement regarding the types of learning that should be recognised with qualifications at given levels. Mapping the EQF/QF-EHEA to frameworks for other regions enables a shared understanding of qualifications involving Europe and the jurisdiction covered by the corresponding framework. In this paper we make recommendations regarding the potential mapping between regional frameworks of qualifications in Europe (QF-EHEA and EQF) and the newly developed East African Qualifications Framework for Higher Education (EAQFHE). These include the need to highlight explicitly the language skills and cultural expectations associated with a qualification. While these are usually implicitly associated with an award due to the associated learning having taken place in a given environment, this paper considers the specific case of transnational education where a qualification aligned to a framework of qualifications designed for one jurisdiction is awarded for learning which has taken place in a different jurisdiction. This raises questions which should be answered as part of any mapping exercise for qualifications frameworks from linguistically and culturally diverse regions, such as a potential future mapping between the EQF/QF-EHEA and the EAQFHE.
Transnational Education

Transnational education is an approach to the international delivery of education whereby the students working towards a qualification are doing so in a country (the host country) other than the home country of the education provider (home institution) (EAQAHE, 2010; Francois, Avoseh, & Griswold, 2016). Popular approaches include *programme franchises* (whereby a university in the host country delivers a programme on behalf of the home institution) and *branch campuses* (whereby the home institution establishes a formal presence in the host country). A third popular approach enabled largely through the use of digital technology is *distance learning* (whereby the programme is delivered online to students in multiple countries). Transnational education is popular due to the potential to attract larger numbers to the home institutions register but it is not without its challenges. The primary challenge for transnational providers relates to quality assurance and the requirement in all cases that *quality assurance must travel* (Knight, 2007; UNESCO/OECD, 2005). This axiom of transnational delivery requires that the quality of the education received by students in all countries must be assured to be equivalent. Many of the greatest failures of transnational education have been due to an inability of the home institution, or its accrediting / regulating body to assure the quality of the programme to the standard required.

Qualifications Frameworks

Qualifications frameworks have been established in many countries to provide a nationally agreed structure within which qualifications are awarded to formal and informal learners. Typically, such frameworks use numbers to designate levels of increasing complexity at which learning can be formally accredited by bodies enabled through legislation to award qualifications. Each level is usually described using a set of descriptors or level indicators which use learning outcomes to identify the level of learning that must have been achieved by a learner in order to become eligible for a qualification. The power of qualifications frameworks is due to their capacity to serve as a communication device which enables a shared understanding of learning and qualifications among all stakeholders in the learning process - including the state and its citizens, employers, universities and the learner themselves. Qualifications frameworks are seen as powerful enablers for creating a learner centred culture of lifelong learning and serve as a foundation stone upon which national and institutional academic quality assurance systems are built. They drive all processes in higher education including recruitment and admission, assessment and feedback, external examination, student transfer and ultimately the making of awards.

International Qualifications Frameworks

Internationally, several initiatives have been undertaken to develop qualifications frameworks that span multiple jurisdictions. In general, the objective of these frameworks isn’t to map national qualifications directly to an international framework but rather, at a secondary level, to map the national qualifications framework in several countries to a single, shared and agreed regional framework. This enables national frameworks to employ locally designed descriptors which are reflective of the national context; while also enabling those countries to map each of their own levels of learning to an international standard. This enables transfer of students not just within the national context but within an international region. The mapping exercise can be illuminating for countries as they seek to reach a point of harmony on what represents a given level of learning, while also identifying differences between the type of learning provided in different national environments. Perhaps the best known development of a regional qualifications framework was achieved through the Bologna process. This European process resulted in the identification of three cycles of higher education structured into the Qualifications Framework of the European Higher Education Area (QF-EHEA) (EHEA, 2005). Each of the three cycles is described according to an internationally agreed set of descriptors (the so-called *Dublin Descriptors*). A later Europe-wide process resulted in the development of the European Qualifications Framework (EQF) (EQF, 2006), an eight-level framework against which learning at all levels – not just in higher education – can be mapped. Most European countries have now completed a process of mapping their national qualifications frameworks to the EQF. The three cycles of the QF-EHEA are compatible with the top three levels of the EQF. The Europe wide frameworks have served to better enable student transfer, credit transfer and the development of joint programmes throughout Europe. They also enable recognition of qualifications across Europe by all stakeholders in higher education, including employers and wider society, in the same way as national qualifications frameworks have achieved this for individual countries.

We can now observe a hierarchy of qualifications frameworks each serving to achieve similar objectives in contexts of increasing cultural heterogeneity. National frameworks map qualifications nationally and international frameworks map national frameworks against each other. The next step is to map international
frameworks against each other which has the benefit of enabling transfer between all those national jurisdictions aligned to the corresponding international frameworks. This, clearly, has significant benefits for transnational provision on a global scale. One such initiative which has the potential to be undertaken is the mapping between the two European frameworks and the recently developed East African Qualifications Framework for Higher Education (EAQFHE). Undertaking such an initiative will better enable the quality assurance of transnational programmes delivered in East Africa by European providers and ensure a shared understanding of those qualifications which are delivered by international providers in the context of the national qualifications systems in East Africa. In the remainder of this paper we discuss the potential for such a mapping, and highlight considerations relating to transnational education which should inform that exercise, in particular the requirement to accurately represent the grounding of an award in a particular language and cultural context.

**East African Qualifications Framework for Higher Education**

The East African Qualifications Framework for Higher Education (EAQFHE) was developed by the Inter-University Council for East Africa (IUCEA) and approved by the East African Community (EAC) Council of Ministers in April 2015. The initiative to develop the framework of qualifications followed the enactment of the East African Community Common Market Protocol in 2010 - the result of a trade agreement (the East African Treaty) which sought to enable the free movement of goods, labour, services and capital among the five members of the East African Community: Burundi, Kenya, Rwanda, Tanzania and Uganda. The EAQFHE aims to enable the transfer and recognition of students, credit and qualifications among those five member countries (EAC, 2015).

The EAQFHE is an eight level framework with the top four levels (5-8) recognising learning in higher education at Diploma, Bachelor’s Degree, Master’s Degree and Doctorate levels or equivalent. Each of the eight levels has associated descriptors which identify the learning which is recognised by qualifications at that level as well as the naming of those qualifications. An accompanying credit system - the East African Credit Accumulation and Transfer System (EACAT) accounts for the volume of learning and enables the effective communication of learning achievements across national boundaries (Kerre, 2015). The framework is currently being mapped, or has been mapped to the frameworks of member countries where such frameworks are already in place (Kenya's 10 level framework, Tanzania's 10 level framework, Rwanda's 7 level framework) and can be mapped to national frameworks to be developed in the future (e.g. Burundi, Uganda, and future members of the East African Community such as South Sudan).

**Key Questions for Mapping of EAQFHE to EQF**

The mapping of the explicit contents of EAQFHE to the EQF (incorporating the three cycles of the QF-EHEA) will enable transnational providers in Europe to articulate the level of their programmes in the context of the level of programmes provided in the East African Community (EAC) member countries. In particular, they will be able to address key questions such as:

- Are the expectations for an EAC Bachelor’s, Master’s of Doctoral degree different to the expectations for the same degree in Europe?
- Are the expectations for graduates of the secondary schooling system comparable to the expectations for graduates of the secondary school system in Europe?

In many respects, these are questions which can be answered through a relatively straightforward desk exercise involving the review of learning outcomes. The more difficult questions relate to those skills and abilities which are implicitly associated with a given award but which are not articulated in a framework of qualifications. International guidelines on transnational education make specific mention of the need to localise an award to the environment in which it is delivered. For example, the UNESCO/OECD (2005) guidelines on transnational education advise education providers to:

"Ensure that the programmes they deliver across borders and in their home country are of comparable quality and that they also take into account the cultural and linguistic sensitivities of the receiving country"

In doing so, however, the education provider is changing the nature of the qualification which is being awarded to the student, and is potentially causing an inconsistent interpretation of a given award. A Bachelors award aligned to a European Qualification Framework (EQF) member framework probably carries with it an assumption that the holder of the award has learning grounded in a European linguistic and cultural environment.
If the same award, still aligned to the EQF, is made to a learner whose learning did not receive the same grounding, this assumption may be proven false. As such, any mapping exercise involving frameworks of qualifications from linguistically and culturally diverse environments, such as a potential future mapping between the EQF/QF-EHEA and the EAQFHE should account for the following:

- **Linguistic grounding**: The language level associated with an award should be explicitly mentioned to guide providers and to enable effective quality assurance of transnational education.

- **Cultural grounding**: Learners will acquire knowledge of national cultures when studying overseas through social interaction and informal activity. Such cultural norms and knowledge may be assumed by employers and other stakeholders for holders of given qualifications, and as such explicit highlighting of these in any mapping exercise will drive institutions to consider how these should be addressed in a transnational context.

**Conclusion**

Transnational education represents a large part of the international service industry and it promises to continue to grow into the future (Bannier, 2016; Chen, 2015; Knight, 2007). Better shared structures across international contexts will be key enablers for ensuring that the quality of transnational delivery meets the expectations of its stakeholders, among whom the learners are the most important. The mapping of qualifications frameworks represents a key step in bringing together a shared understanding of quality and qualifications and the mapping of regionally agreed international frameworks represents an ideal opportunity to undertake such an activity at scale. Some key questions that such a mapping needs to consider are identified in this paper, as part of an initial reflection. First, are the expectations for higher education qualifications comparable? Second, are the expectations from outside the higher education system from lower levels on the framework comparable? Third, are local, cultural and language issues important, implicit aspects of the qualifications? If so, can these be explicitly captured in a mapping exercise so that a consistent, shared understanding of all aspects of learning associated with an international qualification can be achieved? Only through the answering of these questions in a mapping exercise can transnational providers design the right type of programmes for the markets they wish to serve in an international context and ensure that quality assurance will always travel.

**References**

Better Assessment Through Video: The Development of An Assessment Productivity App

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Abstract

It is hard to overestimate the importance of assessment for the learning process. Assessment truly dictates what our learners understand their role and, consequently, how they spend their time: be it in tasks of rote learning or critical reflection and collaborative learning, or, as phenomenographical research suggests, in surface or deep learning approaches. Assessment regimes, however, tend, for various reasons, to be quite conservative and to rely most conspicuously on written coursework and high stakes written examinations. In this context the paper considers the development of a new video-based "assessment productivity" solution called "RedInk" as a way to support an authentic and alternative assessment approach that may well satisfy what are often conflicting requirements for assessment reliability and validity and assessments that perform both a summative and formative function.

Keywords: Assessment, E-Assessment, Formative Assessment, Online Learning, Video

Introduction

It is difficult to overestimate the importance of assessment for the learning process and learner experience. Assessment truly is “at the heart of the student experience” (1994, p. 1): it dictates what our learners do, what they think learning is all about and, consequently, how they spend their time, be it in tasks of rote learning or critical reflection and collaborative learning, or, as phenomenographical research suggests, in surface or deep learning approaches (see, e.g., Biggs, 1987; Marton & Säljö, 1976; Ramsden, 2003).

In this context it is significant that assessment procedures, particularly at higher education, reveal, for various reasons, a deep seated conservatism. As Elton and Johnston (2002) conclude in their review of assessment in universities “assessment is still pervaded by a largely unreflective traditionalism…” (p.9). From the many different assessment tools and methods that could be used, from the many different ways in which learners could be allowed to evidence their learning, it appears that by far the majority of what determines our measurement of a learner’s learning at higher education comes down to just two strongly dominant options: summative written examinations and continuously assessed written work.

Assessment Reliability and Assessment Validity

Why are written exams and other written forms of continuous assessment still so dominant? One way to explain the way in which institutes and systems of education cling to these methods and instruments has to do with the twin requirements for assessment reliability and assessment validity.

Both requirements seem like things we would want from a "good" assessment but can often be at odds with each other or represent competing demands when we try to design assessment tasks or chose the right assessment methods. Multiple choice question tests, for instance, might well be quite reliable way to assess students, but if we are interested in assessing problem solving or critical thinking or team work they would not be very valid.

Since the publication of influential work by Derek Rowntree (1987, originally published 1977) there has been an increasing acknowledgement of the negative consequences of over emphasising the need for reliability over validity. Rowntree himself makes an impassioned plea for what he terms “divergent assessment tasks that produce divergent responses from both students and assessors and from which both are likely to learn” (p. 198) but in face of this argument is the blatant fact that students and other stakeholders may not be happy with divergent results when assessment is “important”, i.e. when it is “high stakes” and summative.

Summative and Formative Assessment

Summative assessment is essentially assessment that measures the sum of student’s learning (Dunn, Morgan, O’Reilly, & Parry, 2003, p. 18), it is a type of assessment that doesn’t afford an opportunity for students to refine a submission or to improve their performance based on feedback and comments: formative assessment, by contrast, is intended and designed to provide exactly this opportunity.

In what is now regarded as a seminal piece of research, Black and Wiliam (1998) reviewed evidence gathering from some 250 sources relating to formative assessment and concluded it is shown to improve learning with relevant gains “amongst the largest ever reported for educational interventions” (p. 61).

Just as good reliability can sometimes get in the way of good validity, what can sometimes get in the way of good formative assessment is the desire for such assessments to also perform a summative functionDunn et al (2003) indicate that if any kind of grade is offered for an assessment that assessment becomes, de facto, a summative assessment even if the assessment doesn’t come at the end of the learning cycle and constructive feedback is provided. Whether this is entirely the case or not, a plausible case can certainly be made that the more high stakes the assessment in summative terms, i.e. the more it ‘matters’ in terms of a student’s final exit grade, the harder it is to combine this with a formative function. For one thing, as Knight (2001) tells us when the stakes are high “…those being assessed are likely to do all they can to conceal ignorance and suggest competence.” (p. 3).

One of the key moves towards an alternative assessment approach with good reliability and good validity, which can also serve summative and formative functions is, in the view of the authors, a turning away from written learning evidence to video-based learning evidence and a particular use of rubric assessment tools. Some brief reflections on both of these ingredients follow.

Video as Assessment Medium

Video as a teaching tool has been with us for some time now. Silent commercial films were around since at least the late 1890s and 16mm projectors whirring behind black window shades were a staple of the innovative classroom for a considerable portion of the 20th century. In this century it would appear that video has truly arrived as an educational technology and while data projectors and computers capable of showing ‘moving pictures’ are still standard at all levels of education and training – educational moving pictures now find its widest audience now online.

In the context of assessment, video is not quite so mainstream yet. Its use in this context has been traditionally been limited by factors such as setup time and cost, requisite production and post production skills, as well as concerns with regard to its reliability and management.

A significant number of assessment methods and learner tasks, however, can be plausibly argued for as giving rise to exactly the kind of learning evidence best captured as some kind of video artefact, such methods and tasks include (Based on list provided in, Knight, 2001, p. 4): Assessment of work-based learning ; Book, website or program reviews; Contribution to in class discussion; Defence of lab records; Exhibitions of work, posters, products; Objective Structured Clinical Examination (OSCE); Openbook, end of course exams; Orals and vivas; Peer assessment ; Performances ; Posters; Projects; ‘Real’ problem working; Role-playing; Selfassessment ; Seminar presentations.

The ‘trick’ in using video for assessment, the authors argue, is simply to make it demonstrably more reliable as well as affordable or manageable for assessors – in the sense of not placing too heavy a burden upon them in terms of their marking and feedback process. Part of the solution lies in the use of a very traditional tool for increasing reliability and consistency: rubrics.
Rubrics for Assessment

The advantages of rubrics in theory and practice are extensively enumerated elsewhere (see, e.g., Andrade, 2000; Arter & McTighe, 2001; Brookhart, 2013) and will not again be detailed here except to note how they uniquely hold potential to increase and ensure greater inter- and intra-rater reliability and, when well implemented, to help provide fast but meaningful feedback to students.

Despite, however, the pedagogical potential of assessment rubrics and the existence of a number of specific online and software-based solutions for developing and applying rubrics, in practice most implements of rubrics appear to still be based on paper or on the use of generic spreadsheet software. In addition while some excellent repositories of rubrics exist (e.g., http://rubistar.4teachers.org and http://www.teach-nology.com/web_tools/rubrics/) typically these collections are not curated or reviewed in a way that allows the ‘best’ rubrics to rise to the top: such systems also typically only offer users the ability to print rubrics and do not offer any interactive tools or functionality.

The RedInk Project

What came to be known as the ‘RedInk’ solution was conceived by the authors as a productivity tool or app for assessment and marking, one that would support the grading and marking of student work in a way that would assure efficiency, transparency of process and, significantly, marry often conflicting desires for good reliability and good validity as well as summative and formative assessment function. From the start both video and rubrics as described were seen as key aspects of the solution. Funding was provided by Enterprise Ireland, the government organisation responsible for the development and growth of Irish enterprises, under a special Commercialisation Fund for third level researchers.

The project began with an iterative process of ideation, research and user-centred design work which ended up producing, inter alia, a series of high fidelity interactive prototypes for the target system: these prototypes subsequently formed the basis for the software design and, ultimately the software development. The software and requirement phase also determined some key architecture and technology aspects, incorporating back-end implementation with Java Spring/Hibernate over a relational database (MySQL) and front-end development using bootstrap CSS framework AngularJS Javascript framework. Under this structure key functional modules were developed in keeping with the original proposal, with a final phase of work being devoted to testing the system and integrating the different modules together with a thorough revised and tested GUI. The solution, as described below, is an innovative SaaS productivity tool for marking and assessment, differentiated from competing products in its combination of extensive social sharing, handling of video submissions, and high granularity/detail with regard to the application of rubrics.

The RedInk Solution – Some Key Features

RedInk can basically be described as having three primary modules or modes of functionality. They are: The Library, Rubric Designer and Grading Tool; all based in some way around the design, application and sharing of rubrics for online assessment.

Key aspects of assessments that are addressed by the modules include:

- Facilitating the rapid creation of Rubrics for advanced online assessment (Library and Rubric Designer)
- Promoting an “Open Culture” around the creation and sharing of Rubrics (Rubric Library)
- Enhancing the accessibility of Rubrics (Rubric Library and Grading Tool)
- Facilitating rapid assessment of multiple formats using Rubrics

The Library

The library module is a space where users can evaluate, build and share rubrics. Based on the concept of crowdsourcing and reputation systems, the library governs the relative popularity of rubrics as a result of user
activity and interaction in the system. The module provides filters and tags for peer reviewed and rated rubric tables, all of which are contributed by the RedInk user base.

**Rubric Designer**

Although, as indicated, there are large quantities of rubrics available online, there is a wide lack of consistency in both form and content. The Rubric Designer aims to scaffold the rubric design process, giving rise to higher quality rubrics and making the process more interactive and user-friendly. When the rubric design process has concluded, the rubrics can be shared with others in the rubric library and re-used or repurposed for other assessments by the designer and by the RedInk community of users.

**Grading Tool**

RedInk’s key features intersect in the Grading Tool module where rubrics are linked to video-based learning evidence. The grading process split into three distinct steps: Markup, Review and Grade.

Using the Markup panel, instructors can apply feedback to student work based on rubrics from the library module. Feedback is granular in nature, meaning rubric descriptors can be applied many times and to multiple segments of the assessment. The Review panel, displays all of the feedback provided or applied. The Grade panel as well as offering cumulative qualitative feedback based on actions in the Markup; can also, significantly, perform a summative function by suggesting individual grades for each of the criteria, including final numeric marks if marks were included in the relevant rubric table.

**Figure 1. The Markup Panel**

**The RedInk Solution – Current Status and Future Directions**

The period of funding for the RedInk project ended in November 2014 but the two authors continue to work on the platform. Although a user-centred design process was core to the development of the solution and involved real users interacting from the very start with prototypes of increasing fidelity, the sample, as it were, was small and, moreover, did not involve the creation any substantial number of rubrics, or the marking and grading of authentic students submissions in any significant number. One of the ambitions of the authors now is to work towards a relatively large scale and ideally longitudinal trial of the software with real assessors and students to establish whether it could, in fact, form the basis for an assessment approach that overcomes some of the conflict inherent in desires for assessment to be both summative and formative, reliable and valid.

The general release of the rubric designer module has also been discussed as a way to populate the system with more rubrics and to leverage the ‘wisdom of the crowd’ in identifying and creating better rubrics, as well as helping us understand what the characteristics of a good rubric actually are. In a related way work is ongoing, though still at an early stage, in developing an analytics and reporting module for the system. In addition to
offering standard frequency distribution tables and, in time, a dashboard for more complex crosstabulations and associated data visualisations, such a module, we envisage, will also offer what might be referred to as inter and intra-rater reliability audits, in other words users could check their assessment choices against that of their colleagues or indeed against their own previous marking and grading outputs. In this way we hope again to address concerns for the reliability of the kinds of assessment methods with which the RedInk system endeavours to challenge existing and dominant assessment regimes in higher education.

References

Awareness of Safe and Responsible Use of ICT among students in a Malaysian University

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Abstract

In Malaysia, in 2013, the DigiCyberSAFE in Schools programme administered a survey on 9,651 students aged 7 to 18 (primary and secondary school students) on their levels of awareness and understanding of cybersafety issues, appropriate online behaviour and ability to safeguard themselves against risks. The current study is conducted on students in a private university, aged from 19 to 24. Its objective is to find out their level of awareness of cybersafety issues and their ability to safeguard themselves against risks. Both qualitative and quantitative research methods are used. Survey questionnaire is used to find out the awareness and understanding of cyber-safety issues and the ability to safeguard against risks. Focus group interview is used to examine students’ perceptions and experiences of risky online activities. The findings show: (i) students feel somewhat safe when they are on the internet. (ii) They have a good understanding of what constitutes risky online activities. (iii) The students also know how to protect themselves while using the internet. (iv) Despite this, they still recognise the importance of learning about internet safety. This research is part of on-going series of cross-country researches that aim to identify the level of awareness of safe and responsible use of ICT among Asia-Pacific digital natives.

Keywords: cybersafety, ICT, internet, online risks, safe and responsible use, university students

Introduction

Information and Communication Technology (ICT) experiences an exponential growth in the past decades. With the cover of anonymity, comes an array of social and ethical issues. Numerous concerns have been raised worldwide, particularly pertaining to online safety and security and misuse of information (UNESCO Bangkok, 2015). Children and “digital natives” (i.e. youths aged 15-24 years old), are particularly vulnerable. In Malaysia, there are 13.5 million Internet users today, with digital natives forming the bulk of these users (CyberSecurity Malaysia).

The CyberSAFE in Schools programme was launched in 2010 by CyberSecurity Malaysia and the Ministry of Education to implement cybersafety projects focusing on the education sector. DiGi Telecommunications Sdn Bhd (DiGi) subsequently launched the DigiCyberSAFE in Schools programme. Few academic researches on cyber-security awareness focused on youngsters and on the issue of safeguarding personal information, according to a survey by Abd Rahim, et.al. (2015). Of particular relevance to the present study are two (2) researches conducted by DiGi Telecommunications Sdn Bhd Malaysia (DiGi) in 2013 and 2014. In the 2013 research, the “Safety Net – Growing Awareness among Malaysian School Children on Staying Safe Online” Survey was administered among 9,651 students comprising primary and secondary students (students aged 7 to 18). The survey was on their levels of awareness and understanding of cyber-safety issues, appropriate online behaviour, ability to safeguard themselves against risks and the impact of the awareness workshops.
The survey was complemented by another survey, “Safety Net: Capacity Building among Malaysian Schoolchildren on Staying Safe Online” (DiGi 2014), which was responded to by approximately 14,000 schoolchildren nationwide. Among the main findings of the 2014 DiGi Survey Report:

- 83% of schoolchildren were vulnerable to online risks due to minimal protective actions taken;
- Two-thirds of younger schoolchildren, below 13 years old took very low protective steps towards online safety.
- Yet, 52% of these schoolchildren still believed that they were safe online;
- An average 70% of schoolchildren were not concerned with the invasion of their privacy or the anonymity of the person they interact with.

Research Problem

There are few academic researches on cyber-security awareness that focused on digital natives, which form the crop of University students in Malaysia today. There has been a call for more active research on digital citizenship in developing countries, in order to produce research findings that could guide policymakers in working out intervention programmes that are appropriate for each country’s needs (UNESCO Bangkok, 2015). The current study seeks to add to the body of literature by providing a preliminary data on university students aged 19-24. The research questions for the current study:

1) To what extent are students aware of online safety and protection?
2) What are the indicators of online safety trends whenever the students go online?
3) What are the main personal concerns of students about internet use?

Objective of the Study

The objective of the current study is to investigate the awareness of safe and responsible use of ICT among higher education students in Malaysia. The research seeks to examine two (2) dimensions of internet-related behaviours among university students:

1) Students’ awareness and practices related to online safety and protection and indicators of online safety trends whenever the students go online;
2) Students’ personal concerns about internet use.

Research Methodology

The current study was conducted on 104 students of a local private university in Malaysia, aged from 19 to 24. Both qualitative and quantitative research methods were used. Survey questionnaire was used to examine two (2) dimensions of internet-related behaviours among university students. Focus group interview was used to examine students’ perceptions and experiences of risky online activities.

Results/Discussion

A total of 103 responses were collected. There are more female respondents (67.3%) compared to male respondents (32.7%). The respondents are divided into five (5) large groups: (1) Science/Engineering/Information Technology/Mathematics, (2) Arts/Social Science, (3) Business/Management/Accounting, (4) Medical/Nursing/Physiotherapy and (5) Others. Students taking Business, Management or Accounting course formed the most respondents, followed by students of Science/Engineering/IT/Mathematics.

It is found that majority of the respondents stay with their housemates in a rented accommodation. Since the University’s two campuses are located in Selangor and Perak, students from other states would invariably be staying in rented accommodations. Besides, 99% of the respondents have a computer with internet access at their place of residence. Majority of the respondents spend around 8 to 22 hours on the internet in a typical week. They primarily use smart phones, notebook and mobile phones in connecting to the internet. The respondents also largely access the internet from home and campus. As for the types of online activities which students usually do, the respondents mostly access social networking sites and researched for schoolwork, which would mean their university assignments and other coursework.
The respondents largely feel safe when they are on the internet and they responded that they know how to protect themselves while using the internet (Figure 2). Despite this, 85% of the respondents agree that it is still important for them to learn about internet safety. When asked what actions are taken to protect themselves on the internet, the bulk of the respondents mentioned that they take a few actions to protect themselves on the internet. This includes, among others, setting their privacy settings, not share too much information about themselves and not revealing personal information. The majority of the respondents share their passwords with no one else. Those who share their passwords largely pick close family members. No respondent has ever shared their passwords with lecturers, spouse, and others. Close friends are preferred compared to roommate/housemates, while boyfriend/girlfriend is preferred over close friends.

It is further observed that respondents usually use 2-3 passwords, while others use unique/different passwords for some accounts, while other accounts have common/shared passwords. No respondent replied that he/she uses the same password for all accounts. Majority of the respondents change their passwords only when they have forgotten the original passwords. Only about 15% of the respondents would change their passwords every year or every few months. Regarding passwords, the respondents mostly use those of at least 8-characters long, and/or have a mix of numbers, “upper” and “lower” case letters. Less than 4% replied that they use just one type of passwords (all alphabet letters only or all numbers only or all symbols only). This shows that generally, students know the requirements for creating strong passwords.

The respondents largely feel that the privacy setting on their social networking account is set to keep them protected from strangers. They are also largely confident about the security of the devices (e.g. phone, tablet) that they use. Majority of them stated that they make it a habit to turn off their Bluetooth or WIFI when the device is not in use.

When asked questions pertaining to the nature of computers at their place of residence and whether there are any forms of parental controls or other rules pertaining to the use of computers, majority of the respondents replied that the computer in their place of residence can be moved around as opposed to being kept in a common area or out in the open. Most of the computers used by the respondents at their place of residence do not have any “parental controls” which filter/restrict/limit the type of websites that they can visit. Lack of parental controls can be due to the fact that students mostly stay at rented accommodations where there are virtually no rules or restrictions imposed. Meanwhile, even where students stay with parents, lack of parental controls is also observed. Generally, at their place of residence, there are no rules for using the internet, and where there are rules, it would seem that these rules seek to safeguard the students from external threats. Hence, generally, the students are allowed a great deal of freedom to use the internet.

Regarding students’ personal concerns about internet use, the respondents were asked about what matters that worry or concern them the most about using the internet. Table 1 shows the findings:
Table 1: Respondents’ personal concerns about internet use

<table>
<thead>
<tr>
<th>Concern</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Becoming addicted or hooked to the internet</td>
<td>92.2%</td>
</tr>
<tr>
<td>Invasion of their privacy</td>
<td>85.4%</td>
</tr>
<tr>
<td>Work not being done because spending too much time on the internet</td>
<td>85.4%</td>
</tr>
<tr>
<td>Anonymity, i.e. not knowing who is on the other end</td>
<td>81.6%</td>
</tr>
<tr>
<td>Bullying on the internet</td>
<td>76.7%</td>
</tr>
<tr>
<td>Not interacting or mixing with people face to face</td>
<td>58.3%</td>
</tr>
<tr>
<td>Not living in the real world</td>
<td>35%</td>
</tr>
<tr>
<td>Others</td>
<td>35.9%</td>
</tr>
<tr>
<td>No worries or concerns at all</td>
<td>1%</td>
</tr>
</tbody>
</table>

It is observed that the respondents are more concerned about becoming addicted or hooked to the internet than invasion of privacy. They are also concerned about work not being done because spending too much time on the internet. Meanwhile, unlike schoolchildren surveyed earlier (DiGi, 2014), the university students here are concerned with the anonymity of the internet. In the next stage of the research, focus group interview was used to examine students’ perceptions and experiences of risky online activities. The interview was conducted with a group of six (6) Accounting students. Three (3) were males while the other three (3) were females. Four (4) students stay in rented accommodation. Two (2) major categories of issues were identified:

(a) Understanding on what constitute risky online activities: It was found that generally, the respondents have a good understanding of what constitutes risky online activities. They were able to mention that they should safeguard personal information whenever going online. They also stated that they never share their passwords with anyone. They stated that they feel safe when they are on the internet.

(b) Awareness of steps needed to protect themselves on the internet: Generally, the respondents are aware of the steps needed to protect themselves on the internet. However, when it comes to passwords, they never change their passwords. They do have same or common passwords for emails and social media accounts. When it comes to online banking accounts, although the password would be different than that used for emails/social media accounts, they will still use the same password for the different banking accounts. As one interviewee said: “Don’t have too many passwords for many accounts...hard to remember...”

Contributions of the Study

The present study shows that the students feel somewhat safe when they are on the internet. They have a good understanding of what constitutes risky online activities. The students also know how to protect themselves while using the internet. Despite this, they still recognise the importance of learning about internet safety. The limitation of this study is that convenient sampling was administered as this study is exploratory in nature, in order to provide an indication of the scenario among undergraduates in a Malaysian University. Hence the findings from this study may not reflect the population but provides an indication as to the issues faced in Malaysia. This study is significant in providing preliminary insights on the awareness of safe and responsible use of ICT among university students in Malaysia. It was mentioned in the Malaysian Education Blueprint 2015-2025 (Higher Education): “Malaysia needs to move from a mass production delivery model to one where technology-enabled innovations are harnessed to democratise access to education and offer more personalised learning experiences to all students.” Globalised online learning environment is here to stay, and there is thus a need to ensure that our students stay safe online.

Conclusion

This research is part of on-going series of cross-country researches that aim to identify the level of awareness of safe and responsible use of ICT among Asia-Pacific digital natives. It is aspired that the findings presented in the study and other upcoming studies to be conducted on a larger student population in Malaysia can help identify the gaps between policy and practice that would need to be addressed or further enhanced by policy-makers.
Acknowledgment

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References:


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Using Technology Acceptance Model to Examine The Usage of Information and Communications Technology Among Nursing Students

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Abstract

The introduction of information and communications technology (ICT) into the field of education has considerably changed the way students learn. This study investigated the perceived usefulness (PU), perceived ease of use (PEOU) and perceived motivation (PM) to use ICT in learning. This survey applied the Technology Acceptance Model (TAM) (Davis, 1989) which encompasses three dimensions of PU [8 items], PEOU [4 items] and PM [5 Items]. Cluster sampling method was used and all the 17-item surveyed were scored using five-point Likert scale. Respondents consisted of 118 college nursing students (Female=94.9%, Male=5.1%, Mean age=19.82±1.733). Almost 60% and 50% of the respondents used ICT for assignment and learning respectively. In terms of perceived usefulness of technology, majority perceived that learning was made easier by using ICT. They perceived that ICT allowed them to learn and cover more material and communicating and working well with others. In terms of the ease of use of technology, respondents perceived it was easy to use, flexible to interact with and easy to become skillful in using it. As for the motivation to use technology, majority of the respondents enjoyed using it as it is flexible and provided personal touch in gathering required information. T-test yielded non-significant results for all the three dimensions according to gender but significant results were obtained between ‘occasionally’ group (OG) and ‘frequently’ group (FG) using ICT for assignment and learning respectively. Mean scores revealed that FG perceived ICT to be more useful, easier to use and more motivated to use as compared to OG. The analysis of variance on the three dimensions showed insignificant results according to age group and semester. The integration of technology in learning has shown to be beneficial and should be encouraged and research on its promotion and barriers of using it should continue to be scrutinized.

Keywords: Ease of use of technology; Internet-based learning medium; Motivation to use technology; Technology Acceptance Model; Usefulness of technology

Introduction

The introduction of ICT into the field of education has considerably changed the way students learn. Numerous research has reported rampant usage of internet-based information resources to complete assignments and searching for academic resources (Arumugam, 2011; Ogedebe, 2012; Tastan, Tastan, Iyigun & Ayhan, 2011; Thang & Wong, 2010). The internet has also been seen as an important medium for proper higher education to greater heights as the world moves further into the knowledge economy (Yung, Fadhilah & Wan Hussain, 2013). In addition ICT has become an important component of quality-oriented education as it encourages students to obtain current and up-to-date information (Asdaque, Nasir Khan and Abbas Rizvi, 2010; Liu, 2009; Ogedebe, 2012). Despite the excellent potential of the internet as a learning medium, its value will not be realized if students do not accept it for learning (Lee, Cheung & Chen, 2005). Thus there is a need to examine the student acceptance of ICT in order to understand the various variables influencing acceptance.

The examination of nursing student acceptance of ICT would be best understood through the application of Technology Acceptance Model (TAM) which was initially developed by Davis in 1986. TAM provides a theoretical framework to explain, predict, and identify factors on internal beliefs, attitudes, and intentions of technology end-user (Kowitlawakul, 2008).
The use of technology by students for learning are influenced by numerous factors. Previous research has shown that the lack of use of technology for learning among students may be attributed to factors related to the individual user such as attitude and self-efficacy (Teo, 2008; Tsai, 2010), complexity of technology (Teo, 2009) and the environment such as facilitating conditions (Ngai et al., 2007).

In a study of student teachers, Teo et al. (2014) found that students with less experience in technology had a higher level of technology acceptance than those with more experience, Similarly younger students accepted technology far more than the older students as younger users tend to react to technology more positively. Bennett and Maton (2010) attributed the age differentiation to continuous, pervasive exposure to modern technology among the younger users. Similarly, Yang et al. (2014) found similar trend in China where the older undergraduates used internet for learning (28.7%) more than the younger students (14.1%).

Research Problem

Examination of supporting factors of using ICT to learn among nursing students has not been thoroughly conducted. This gap is worthy of researching as numerous researchers has reported the benefits of using ICT in the learning process. Ahmad and Love (2013) revealed that among undergraduates of higher learning institutions, the factors found to affect the students’ acceptance of technology were performance expectancy (usefulness), effort expectancy (ease of use), influence of lecturers, quality of services and personal innovativeness. Tastan, Tastan, Iyigun and Ayhan (2011) found nursing students in Turkey perceived internet to be a useful tool which can contribute positively to their nursing education. In addition, Shahi (2012) revealed first year nursing students in Nepal enjoyed working with computers and perceived computers as a necessity to enhance their knowledge and helped develop their self-confidence. Hsu (2011) found in Taiwan nursing students’ attitude were positive towards the course through e-learning. The respondents spent more time learning and worked harder using computers which allowed them to employ various learning strategies and mobilize various learning resources. Thus it is imperative to examine students’ acceptance of technology in the learning process.

Objectives of the Study

This study examined the usefulness, ease of use and motivation to use ICT in learning among nursing students. Specifically this study examined the perceptions of a sample of nursing students on the use of ICT to complete their assignment and learning.

Research Methodology

This survey applied the Technology Acceptance Model (TAM: Davis, 1989). The research instrument comprised of the ‘acceptance of technology’ dimensions of ‘perceived usefulness’ [8 items], ‘ease of use’ [4 items] and ‘motivation’ [5 Items]) with split-half reliability of 0.7536. Cluster sampling method was used and all the 17-item surveyed were scored using five-point Likert scale (from 1 = strongly disagree, 2 = disagree, 3 = moderate, 4 = agree, 5 = strongly agree). Descriptive statistics (frequency, percentage, mean, stand deviation) and inferential statistics (t-test and ANOVA) according to gender, usage (occasionally and frequently), age group and semester were used to investigate the nursing students’ perception on the acceptance of technology in their academic life.

Likert Scale questionnaire was used in this study because it is the most universal method for survey. Likert scales are easily understood, and the responses are easily quantifiable. Since it does not require the participant to provide a simple and concrete yes or no answer, it does not force the participant to take a stand on a particular item, but allows them to respond in a degree of agreement; this makes item answering easier on the respondent. When the items measure the same factor, they are grouped together and mean value could be determined for further analysis (Fisher, 2004, Kumar, 2012).
Results /Discussions

Descriptive statistics:

Respondents consisted of 118 diploma level nursing students (Female=94.9%, Male=5.1%, Mean age=19.82±1.733). Forty-four percentage of the respondents was below 20 years old, almost 51% were 20-22 years old and 5% was above 23 years old. There were semester 1 to 5 students with 75% of them from semester 1, 3 and 5. Majority (57.3%) of the respondents use ICT for assignment frequently and 42.7% used occasionally. For learning, majority (51.8%) use occasionally and 48.2% used ICT frequently.

The total score for TAM ranged from 17 – 85, with scores toward 85 indicating a higher level of technology acceptance. The sample mean score for this study was 60.81, suggesting a high level of technology acceptance. The mean values of all items were above the midpoint of 3.00 and ranged from 3.06 to 4.05. The standard deviations ranged from 0.72 to 0.91, reflecting a fairly narrow spread of scores around the mean.

Data analysis in Table 1 showed respondents’ perceived usefulness of technology. The total score of the dimension ranged from 8 – 40, with scores toward 40 showing a higher level of perception of usefulness of technology. The mean for usefulness was 28.55 (SD=3.25) indicating accepting technology as useful for learning. However, the high standard deviation values showed high variability in scores, this might be affected by extreme scores. Further, almost 76% of the respondents ‘agreed and strongly agreed’ that learning was made easier by using ICT. They perceived that ICT was a useful tool which allowed them to learn and cover more materials, and communicating and working well with others.

Table 1. Respondents’ perceived usefulness of technology

<table>
<thead>
<tr>
<th>Statement</th>
<th>Frequency (%)</th>
<th>Mean</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning is made easier by using ICT</td>
<td>0(0.0)</td>
<td>4.05</td>
<td>0.72</td>
<td>2(1.7)</td>
<td>26(22.0)</td>
<td>54 (45.8)</td>
<td>36 (30.5)</td>
</tr>
<tr>
<td>ICT does not make me a more effective learner</td>
<td>18(15.3)</td>
<td>3.53</td>
<td>0.91</td>
<td>41(34.7)</td>
<td>4(32.8)</td>
<td>11(9.5)</td>
<td>2(1.7)</td>
</tr>
<tr>
<td>I can learn and cover material more quickly through the use of ICT</td>
<td>1(0.8)</td>
<td>3.69</td>
<td>0.83</td>
<td>6(5.1)</td>
<td>39(33.1)</td>
<td>55 (46.0)</td>
<td>17(14.4)</td>
</tr>
<tr>
<td>My learning performance is generally the same with ICT</td>
<td>4(3.4)</td>
<td>3.06</td>
<td>0.73</td>
<td>24(20.3)</td>
<td>68(57.6)</td>
<td>18(15.1)</td>
<td>3(2.5)</td>
</tr>
<tr>
<td>I use ICT because it gives me control over things I want to do in my studies</td>
<td>1(0.8)</td>
<td>3.26</td>
<td>0.68</td>
<td>24(20.3)</td>
<td>46(39.0)</td>
<td>46 (39.0)</td>
<td>4(3.4)</td>
</tr>
<tr>
<td>ICT allows me to produce more in the time I have</td>
<td>1(0.8)</td>
<td>3.25</td>
<td>0.77</td>
<td>13(11.0)</td>
<td>54(45.3)</td>
<td>44(37.2)</td>
<td>6(5.1)</td>
</tr>
<tr>
<td>ICT is useful as a learning tool</td>
<td>0(0.0)</td>
<td>3.95</td>
<td>0.79</td>
<td>3(2.7)</td>
<td>52(42.1)</td>
<td>56(47.5)</td>
<td>28(23.7)</td>
</tr>
<tr>
<td>I use ICT because it allow me to communicate and work with others doing the same course as me</td>
<td>2(1.7)</td>
<td>3.68</td>
<td>0.91</td>
<td>10(8.5)</td>
<td>36(30.5)</td>
<td>46(39.0)</td>
<td>24(20.3)</td>
</tr>
</tbody>
</table>

Alshare and Lane (2011) demonstrated in their study that the respondents perceived the internet to be an effective mean which contributes to the increase of their academic performance. Similarly Davies (1989) stressed that people tend to use or not use an application to the extent that they belief it will help them perform better.

Table 2. Respondents’ perceived ease of use for technology

<table>
<thead>
<tr>
<th>Statement</th>
<th>Frequency (%)</th>
<th>Mean</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>I find ICT difficult to learn to use on my course</td>
<td>18(15.3)</td>
<td>3.67</td>
<td>0.90</td>
<td>58(49.5)</td>
<td>29(24.2)</td>
<td>11(9.5)</td>
<td>2(1.7)</td>
</tr>
<tr>
<td>ICT is generally easy to use on my course</td>
<td>1(0.8)</td>
<td>3.39</td>
<td>0.71</td>
<td>8(6.8)</td>
<td>58(49.2)</td>
<td>40(33.9)</td>
<td>5(4.2)</td>
</tr>
<tr>
<td>I find it easy to become skillful in using ICT on my course</td>
<td>1(0.8)</td>
<td>3.33</td>
<td>0.71</td>
<td>9(7.6)</td>
<td>63(53.4)</td>
<td>40(33.9)</td>
<td>5(4.2)</td>
</tr>
<tr>
<td>I find ICT flexible to interact with on my course</td>
<td>0(0.0)</td>
<td>3.44</td>
<td>0.67</td>
<td>54(45.3)</td>
<td>43(36.4)</td>
<td>43(36.4)</td>
<td>7(5.9)</td>
</tr>
</tbody>
</table>


Table 2 reported respondents’ perceived ease of use of technology. The sample mean was 13.83 (SD=2.12) of the total score that ranged from 4 to 20 showing a slight perceived ease of use of technology. However, the high standard deviation values showed high variability in scores. In addition, almost 65% of the respondents perceived it was not difficult to use ICT. Between 38-43% perceived ICT (A and SA) was flexible to interact with and easy to become skillful in using it.

The results on the slight ease of use of ICT may be explained by Alshare and Lane (2011) that about 20% of the respondents of their studies needed additional training either for accessing resources or technical training. To become skillful, students must use ICT continuously until it formed a “habit” within the students (Limayem &
According to Davies (1989) people tend to use or not use an application to the extent that they believe it will help them perform better, although the ease of use is a factor, they might still use it if the benefits outweigh the difficulty level. However, Edmunds, Thorpe and Conole (2012) found in comparing students’ ICT skills that those who scored higher in ICT at work were using more ICT. On the other hand Wu, Tao and Yang (2008) revealed that the acceptance of technology depended on the ease of use of a designed information system (Wu, Tao, & Yang, 2008).

Table 3. Respondents’ acceptance of technology based on motivation

<table>
<thead>
<tr>
<th>Statement</th>
<th>Frequency (%)</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>I use ICT because it allows me to learn wherever I need to</td>
<td>7 (3.2)</td>
<td>22</td>
<td>1.24</td>
</tr>
<tr>
<td>I use ICT because it allows me to have all the information I need for my studies in different subjects</td>
<td>6 (3.4)</td>
<td>21</td>
<td>1.41</td>
</tr>
<tr>
<td>I use ICT because it makes study activities more personal</td>
<td>5 (3.6)</td>
<td>18</td>
<td>1.34</td>
</tr>
<tr>
<td>I use ICT because it is enjoyable to use while studying</td>
<td>4 (3.9)</td>
<td>13</td>
<td>1.11</td>
</tr>
<tr>
<td>I find it difficult to control ICT and make it do what I want on my course</td>
<td>3 (2.5)</td>
<td>3.39</td>
<td>0.87</td>
</tr>
</tbody>
</table>

The analysis of the motivation items in Table 3 showed that the mean score for motivation dimension was 18.42 (SD=2.64) from the range total score of 5 – 25 revealing high motivation among nurses in using technology for learning. However, the high standard deviation values showed high variability in scores. The data also revealed that 91% of the respondents ‘agree’ and ‘strongly agree’ that ICT allowed them to learn wherever they need to. They perceived that apart from enjoyable to use while studying, ICT provided personal touch and allowed gathering of information required for variety of subjects learned.

The perceived feeling of personal touch may be explained by the hands-on experience that promoted students’ satisfaction when using the internet (Alshare & Lane, 2011). In addition, Limayem and Cheung (2011) revealed in their study that the continued usage of the internet formed a “habit” within the students and helped them learn at their own pace. Further, ICT provided opportunities to students in obtaining current and up-to-date information, as well as to gather and utilize the information they needed (Liu, 2009). Students tended to use more ICT when they felt motivated (Edmunds & Thorpe, 2012; Roca & Gagne, 2008).

Inferential statistics: T-test yielded non-significant results for all the three dimensions (PU, PEOU, PM) according to gender but significant results were obtained when groups ‘occasionally’ (OG) and ‘frequently (FG)’ used ICT for doing assignment (usefulness: t(115)=-3.053, p<.05; ease of use: t(115)=-4.393, p<.05; motivation: t(115)=-3.654, p<.05) and learning (usefulness: t(112)=-3.658, p<.05; ease of use: t(112)=-2.240, p<.05; motivation: t(112)=-4.683, p<.05) were compared. In terms of using ICT to complete assignments, the mean scores revealed that the FG perceived ICT to be more useful, more ease of use and more motivated to use ICT as compared to the OG. Similar results were obtained for using ICT for learning in the three dimensions. The analysis of variance on the three dimensions showed insignificant results according to age group and semester.

The insignificant results of usefulness and ease of ICT used according to gender in this study was similar to the findings of Arumugam (2011) among Malaysian undergraduates. However, the imbalance percentages of male and female respondents might affect the results of this study (Female=94.9%, Male=5.1%) as Wu and Yeh (2012) reported in a study of 443 students (male=51.47%, female=48.53%) that a significantly higher confidence in competences in male than female students although the female students scored higher in terms of frequency of usage and perceived importance of using electronic materials from the library. However, previous research suggests that individuals’ expectations of ICT use might be different because of gender, age, and experience. Researchers supported the notion that effort expectancy strongly affected the intention of using ICT for women (Venkatesh & Morris, 2000; Venkatesh, Morris, & Ackerman, 2000; Vankatesh et al., 2003), particularly those who are older (Morris & Vankatesh, 2000) and who have little experience with ICT (Venkatesh et al., 2003).

The acceptance of technology among nursing students in this study might be explained by the concept of performance and effort expectancy. Previous researchers (Wang, Wu, & Wang, 2009; Chong et al., 2011) found performance expectancy influenced the intention to use ICT. Students with high performance expectancy believed that using ICT was beneficial to them in their studies thus accepted ICT more than students with lower performance expectancies. Similarly, effort expectancy was also proven to be a significant influence on student intention to use ICT (Wang, Wu, & Wang 2009; Chong et al., 2011; Liu, Li, & Carlsson, 2010). Students were...
willing to accept ICT if the system and applications were easy to use and they would not need much instruction on how to use it.

In terms of motivation, Venkatesh, Speier and Morris (2002) emphasized that both extrinsic and intrinsic motivations as predictors of behavioral intention to use ICT. Motivation involves the internal processes that give behavior its energy and direction (Reeve, 1996).

Contributions of the study

Even though literature has shown that studies had been conducted overseas and in Malaysia (eg. Ahmad and Love, 2013; Ayhan, 2011; Guan, Mohammed Isa, Hashim, Kumar Pilai and Harbajan Singh, 2012; Shahi, 2012; Wong, Shannon & Ross, 2013), apparently there was no research conducted using Technology Acceptance Model (TAM) among Malaysian nursing students. This research findings would provide some preliminary data for future research on the acceptance of technology in learning among nursing students.

Conclusions

It is hoped that this study has contributed to the ensuing debates on technology acceptance in education and offered additional insights into the use of ICT among nursing students. The results of this study revealed high level acceptance of ICT for learning. In addition, the respondents’ perceived ICT as useful and they were motivated to use ICT in learning. However, the results showed only slight perceived ease of ICT usage and 45% (mean score) of the respondents scored ‘Neutral’ scale for the ‘ease of use’ dimension. Thus further study should focus on the limitation and technical difficulties that the students might face. Further assess on the impact of internet on students’ learning performance would be useful.

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Students’ Acceptance of E-Library System in Higher Learning Institution

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Abstract

The growth of the information system technology has brought dramatic changes in learning resource facilities. Digital library or E-library system plays an important role to provide convenience and huge information to users. Although a lot of money has been spent on electronic resources, but previous researches on digital libraries has shown that potential users may not use the systems in spite of their availability. This study was conducted to determine the constructs that influence the users’ acceptance of e-library system. Using the technology acceptance model (TAM) as a theoretical framework, this study investigates the effect of the system characteristics such as the relevance, screen design and terminology toward the perceived ease of use and perceived usefulness on intention to use the e-library system. A case study on a private university college has been conducted using quantitative survey method. 140 students have participated in the study. The result of the study suggested that the construct screen design has the strongest effect on perceived ease of use of e-library system. Perceived ease of use and perceived usefulness are found to have significant impact on intention to use e-library system.

Keywords: e-library, correlation analysis, quantitative study, technology acceptance

Introduction

The emergence of e-library system provides convenience to the students during their learning life. The term ‘e-library’ refers to a library that ubiquity and available at anytime anywhere, allowing users to access it over the Internet via their personal computers, mobile computers, and mobile devices. E-library is a collection of information and services that help end users to deal with information objects, available directly or indirectly through electronic or digital devices (Che Rusuli et al 2013; Miller & Khera 2010; Ramayah 2006). Park et al (2009) and Sheeja (2010) state that the e-library system’s functions included search the books in the library, find and download the e-books and ejournals, order and purchase books, etc. further provides an opportunity for the users to do their research or assignment. Thong et al (2002) claim that the major advantages of e-library over the traditional library are the resources stored in digital form easier to keep track, it can be fast and fair for remote access the e-library collections and allows users use the search engine to search the desired resources.

There are many higher institutions which provide e-library services. One of the private university colleges was chosen in this study. This private university college is a premier institution of higher learning education in Malaysia. It was established in 1969 and had 44 years of academic excellence. In 2013 it has been upgraded to University College. This private university college has a main campus at Kuala Lumpur and three branches in Johor, Perak, and Penang. Besides these, it also has two faculties and centre in Pahang and Sabah.

This private university college’s e-library system holds a collection of about 200,000 volumes of books and 10,000 units of electronic or audiovisual materials. It is easy to use from any Internet-connected personal computers or mobile devices. This e-library system is shared with each branches and faculties of this private university college. The staff and students have their own account to access and use the functions or services in this system. It is estimated that 24,000 students who have using this system. The resources that this e-library system provides include e-books, e-journals, online electronic resources, etc. Students can use the search function in this system to search and save the desired books into a cart, access online database to read and download the e-books and e-journals, search the library holdings, and check the status of the requests.
Research Problem

E-library system have been developed rapidly and huge amount of money was spent but previous researches indicated that many users still lack use of it (Xie 2006; Thong et al 2002). Research on the factors that affect the user’s acceptance of e-library system was rarely been conducted (Park et al.2009). The lack of research on this issues was dynamics raises critical questions on the information systems failure. Therefore, it is important to examine users’ acceptance on this elibrary system. An interview of library officer has been conducted in Johor Branch Campus. Finding revealed that students are too dependent on the librarians toward the functions on the e-library system instead of trying by themselves. Although the librarians have provided guidelines to the students about how to use the e-library system but students still dislike trying it. In addition, a preliminary survey showed that the usage of this e-library system was underutilized. 91 out of 100 students stated that they had never tried and used the e-library system. Only 9 students have tried this system but they were rarely using it. This result indicated that there is a need for research on users’ acceptance of e-library system.

Objectives of the Study:

The objective of this study is to identify the constructs that influence users’ acceptance of e-library system through a proposed conceptual research model. This study will focus on the e-library system of this private university college. The target audiences are the diploma level students from different programmes of each faculty at Johor Branch of this private university college.

Research Methodology

In this study, the TAM is adopted as a proposed model to examine a series of hypothesized relationships that are relevant to users’ acceptance of e-library system. The external constructs that were chosen and applied in this proposed model focused on the system characteristics which included relevance, screen design and terminology.

Relevance refers to the degree to which the digital library provides the user with the information they are requesting. Screen design refers to how the system display and presented information and makes it as easy as possible for the user to both navigate the system and quickly retrieve the desired information. Terminology refers to the words, sentences, and abbreviations used by the system (Vaidyanathan et al. 2005). The belief constructs included perceived usefulness and perceived ease of use. The dependent construct was the behaviour intention (intention to use). The proposed model is depicted in Figure 1.

This study used online Google Form questionnaire as the instrument. Invitation to participate in this survey was sent through the social network media such as Facebook. The respondents are the senior and junior year diploma level students from different programmes. After collecting the data, quantitative software was used to analyze all the collected data in order to understand the relationship among the hypothesis.

The entire acceptance questions in the developed questionnaire are measured based on the five scales items of Likert-type scales. After the content validity and expert review, a pilot test was conducted to test the reliability of this study. An amended questionnaire was distributed for this pilot test. A total of 30 samples from the other branch campus of this private university college was collected. The Penang Branch was selected for this pilot test. Cronbach alpha has been tested for the reliability of the pilot study on each constructs. Table 1 shows the questions for each constructs on the final questionnaire.

<table>
<thead>
<tr>
<th>Relevance</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>The resources in the e-library relates well to my study needs.</td>
</tr>
<tr>
<td>Q2</td>
<td>The e-library has enough resources for my studies.</td>
</tr>
<tr>
<td>Q3</td>
<td>I believe that the e-library is an efficient study tool.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Screen Design</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>The e-library commands are well depicted by buttons and symbols.</td>
</tr>
<tr>
<td>Q2</td>
<td>The layout of the e-library screens is clear and consistent.</td>
</tr>
<tr>
<td>Q3</td>
<td>Fonts (style, colour, and saturation) are easy to read on-screen.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Terminology</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>I understand most of the terms that are used throughout the e-library.</td>
</tr>
<tr>
<td>Q2</td>
<td>The use of terms throughout the e-library is consistent.</td>
</tr>
<tr>
<td>Q3</td>
<td>The e-library provides terms that are easy to understand.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Perceived Usefulness</th>
<th>Question</th>
</tr>
</thead>
</table>
The population for this study is 250 students. To ensure the data accuracy and avoid any possible issues in the future, a total 160 of sample sizes will be collected in this study. According to Chua (2012), the convenience sampling procedure suitable in this study because the population does not have equal chances to be selected as the research respondents. Thus, in order to collect a total 160 sample sizes from the population of 250 students, the convenience sampling is applied. All the students who are currently studying at Johor Branch of this private university college will be randomly selected as respondents.

The Pearson’s Correlation Analysis was applied in this study for data analysis. The Pearson’s Correlation Analysis is used to determine whether there is an association between two variables and also measure the strength and direction of that association.

Results /Discussions

The questionnaire was distributed and only a total of 149 responds of 160 sample sizes received. Furthermore, from these 149 respondents found that 9 set of the respondents not answer completed yet. Therefore, only 140 sets of responds were taken for analysis in this study and the response rate was 87.5%. This sample is considered as enough to examine the user acceptance in e-library system.

From the results of Pearson’s Correlation Analysis, can conclude that all of the constructs that applied in this study were significant with the hypothesized relationship in the proposal model. Meaning to say, the relevance constructs has significant relationship with perceived usefulness construct in the user acceptance of e-library system with correlation coefficient value of 0.521. Besides this, the relevance construct also has significant relationship with perceived ease of use construct in the user acceptance of e-library system with correlation coefficient value of 0.473.

In addition, the screen design construct has significant relationship with perceived usefulness construct in the user acceptance of e-library system with correlation coefficient value of 0.530. Besides this, the screen design construct also has significant relationship with perceived ease of use construct in the user acceptance of e-library system with correlation coefficient value of 0.570. The terminology construct has significant relationship with perceived usefulness construct in the user acceptance of e-library system with correlation coefficient value of 0.491. Additionally, the terminology construct has significant relationship with perceived ease of use construct in the user acceptance of e-library system with correlation coefficient value of 0.527.

The perceived usefulness construct has significant relationship with intention to use construct in the user acceptance of e-library system with correlation coefficient value of 0.524. In addition, the perceived ease of use construct has significant relationship with perceived usefulness construct in the user acceptance of e-library system with correlation coefficient value of 0.566.

Furthermore, the perceived ease of use construct also has significant relationship with intention to use construct in the user acceptance of e-library system with correlation coefficient value of 0.553. Therefore, the results can be summarized as the screen design construct has the strongest positive effect on perceived ease of use of e-library system. The finalized proposed model based on the Pearson’s Correlations Analysis has been explained in Figure 2.
Contributions of the study

From this study, the results shown the screen design construct has the strongest positive effect on perceived ease of use of e-library system. This result indicated the screen design is the main concern to the users while using an information system. That is means the screen design is an important factors that need to consider by the system developers while designing and developing an information system.

The management such as the administrators of this private university college now can identify the screen design is the underlying constructs that influence the students’ acceptance of e-library system. Thus, the management can try to improve the screen design in existing e-library system to attract more students to utilize e-library system.

Conclusions

From the results of Pearson’s Correlations Analysis, each of the hypotheses in this study has been summarized. These results concluded that all of the constructs applied in this study were significant with the hypothesized relationship in the proposal model. Results indicated that the screen design construct has the strongest positive effect on perceived ease of use of e-library system. Therefore, the screen design is the factor that need to considered when develop an information system. In this study, chosen constructs were the constructs that used by previous researchers. In the future, there may uses the constructs which are relevant to the latest technology or never applied before such as the Internet access, device used to study the users’ acceptance of e-library system.

Figures/Display Elements

![Figure 1. The proposed conceptual research model.](image1)

![Figure 2. Finalized proposed model based on the Pearson’s Correlations Analysis.](image2)
References


Open Educational Resources (OER): A Malaysian Secondary School’s Perspective

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Abstract

Malaysian Higher Education Institutions (HEIs) from the public sector have been actively involved in the development and promotion of OER in Malaysia. The development and awareness of OER among Malaysian schools are still uncharted. The study aims in finding out the status of awareness, usage, intention to use OER in future and the contribution of OER by Malaysian secondary school teachers. A structured survey was conducted in one of the Malaysian secondary schools and a total of 138 teachers responded. The findings are: (i) the intention to use OER in schools is high although the awareness, usage level and contribution to OER are low; (ii) the barriers to use of OER in schools include time consuming, difficulty in locating OER and the reliability and validity of OER; (iii) benefits identified are OER can enhance users’ knowledge, sharing best practice and enhance current practice; and (iv) the common OER used by teachers are PowerPoint slides, images and assessments. The study explores the current status of awareness and usage of OER in Malaysian schools and it provides some preliminary knowledge to the authority concerned in the promotion and development of OER in schools if it was to carry out in future.

Keywords: OER, Open Educational Resources, Malaysia, Secondary schools

Introduction

Open Educational Resources (OER) movement started in 2002 after the UNESCO Forum on Open Courseware. Since then it picks up momentum because many countries see the potential of OER. OER movement not only change the scenario and trend of teacher-centred education to the one that brings promises in education reform; the student-centred education. Much work on OER in higher education has taken place in the United States of America, but practices are growing rapidly internationally. One of the major approaches in promoting OER globally is through OpenCourseWare (OCW), where the focus is on developing and sharing the freely available, stand-alone, online course, and teaching materials. OCW usually includes items such as lecture notes, reading lists, course assignments, syllabi, study materials, tests, samples and simulations. These OER can be used, reused, repurposed and modified freely without infringement of copyrights. Educators now do not need to reinvent the wheel by themselves anymore; they can use, reuse, repurpose and modify any OER to suit their purpose. By nature of its free and open concepts the cost of production of educational resources can be minimized or reduced to an affordable level. OER is an important concept and a turning point in education; as it levels the education field for all, whether you are rich or poor, privileged or under privileged. It provides equal chance for all to be educated because these resources are available at no cost (or minimal cost if any) and users are allowed to use them freely for their personal development. It is free education for all.

The development and implementation of OER in Malaysia is in line with two of the seven strategic thrusts of the National Higher Education Strategic Plan (PSPTN); that are widening access and enhancing equity as well as enculturation of lifelong learning (Mohamed, 2013). The development of OER in Malaysia is a continuous effort to make Malaysia a centre of excellence in education. According to Mohamed (2013) local OERs’ development includes Wawasan Open University-OER Asia, OUM OER, UTM Open CourseWare, IMU
Webinar Learning Series; besides that individual and SIG initiatives include Web 2.0 OER, Just-in-time Training 2U (JiT2U), ZaidLearn, Learning Innovation Circle (LIC) and Learning Innovation Talks (LIT).

In a local study it was found that the use of digital resources in Malaysian Higher Educational Institutions (HEIs) was confined to digital readers (e.g., Adobe Acrobat reader), online class discussions, images or visual materials (drawings, photographs, art, posters, etc.) and news or other media sources. Digital facsimiles of ancient or historical manuscripts, personal online diaries (e.g., blogs) and maps were the least used (Abeywardena, Dhanarajan, & Choo, 2013). In the same study they found that search engines/directories, personal collections of resources, and online journals were the best sources for finding digital resources; whilst the most popular uses of digital resources was incorporating them into lectures/online lectures. On the contrary there are some negative findings too: these include the use of digital resources would not help academic staff to get promotion; the use of OER will promote plagiarism from the Web and the use of OER will distract academic staff from core goals of teaching. The respondents also felt that they need support; like finding digital resources, assessing the credibility of digital resources, evaluating the appropriateness of resources for teaching goals and interpreting copyright laws and/ or securing copyright permissions in order to fully harness the potential of OER in teaching and learning.

It was encouraging to note that 70 per cent of the respondents said that they have used OER in their teaching. Although 13 per cent had not used OER before, 86 per cent mentioned that they would use them in the future. From the above data, it shows that the development of OER in Malaysia is very positive. They obtained their OER by means of downloaded from the Internet and coming from co-operation with other institutions. On the other hand, it was surprising to note that they seldom download OER from repositories such as MIT OpenCourseWare, MERLOT, OpenLearn and Connexions.

HEIs in Malaysia are not only the users of OER; they are also contributors of OER. It was found that 74 per cent of the respondents were producing OER as learning objects or as part/full courses and programmes. This could be due to the support the respondents are getting from the institutions in terms of use and production of OER. The only drawback was lack of co-operation with other HEIs when it comes to producing and exchanging OER.

Research Problem

Previous research by Hoosen (2012) stated that OER activities are mainly confined to university level, OER activities in both primary and secondary schools are lacking. There is a need to carry out OER study at the school level so that they are not left behind. Currently there is very few research carried out in Malaysia on the use of OER in schools. Therefore, this research is trying to fill the gap on the lack of study of OER use in school.

The research questions for the study include:

- What is the level of awareness on OER among Malaysian teachers?
- What is the level of adoption of OER among Malaysian teachers?
- What is the level of contribution of OER among Malaysian teachers?
- What is the level of intention to use OER in future among Malaysian teachers?
- What are the perceived benefits and barriers on the use of OER among Malaysian teachers?
- What are the popular types of OERs used by Malaysian teachers?

Objectives of the Study

The study aims at closing the gap between the development of OER in HEIs and Malaysian secondary schools. OER are important learning and teaching resources in education, if students and teachers can use them in the early stage of education then they can have a better head start for quality education.

Research Methodology

The study adopted quantitative approach to investigate the adoption of OER by teachers in Malaysian school. Survey questionnaire is used to collect data on demography and status of awareness. Quantitative results are presented using descriptive statistics and graphs.
Results /Discussions

A total of 165 survey questionnaires was distributed among teachers from a secondary school in Klang Valley (Malaysia); however the response rate is 83.6% (n = 138). The survey instrument consists of two parts; namely, demographic and status of OER use. The details are as follows:

The first part of the survey shows the profile of the respondents according to age group. The respondents came from different age groups; however the majority of them are from 41-50 age group (37%). The distribution of teachers among different age group is left skewed, as shown in Table 1 below.

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 20</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>21-30</td>
<td>26</td>
<td>18.8</td>
</tr>
<tr>
<td>31-40</td>
<td>35</td>
<td>25.4</td>
</tr>
<tr>
<td>41-50</td>
<td>51</td>
<td>37.0</td>
</tr>
<tr>
<td>&gt;50</td>
<td>26</td>
<td>18.8</td>
</tr>
</tbody>
</table>

The second part of the survey consists of data on awareness, usage, contribution and intention to use OER in future. The following will illustrate the dimensions in the form of graphs. Figure 1 shows that 14.5% of the respondents contribute to the creation of OER; use of OER is 31.9%, awareness on OER is 38.4% and intention to use OER in future is 70.3%. It is encouraging to note that the intention to use OER in future is high. Therefore; it is timely for the authority to formulate policy and plan to make it a success.

The survey identifies the following barriers in the adoption process; it is time consuming to find OER, difficulties in locating the appropriate OER, reliability and validity of OER, copyright infringement related issues, lack of support and lack of reward. Figure 2 shows the various barriers encountered by the respondents; the three major barriers are: it is time consuming to find OER (71.0%), difficulty in locating the appropriate OER (48.6%) and the reliability and validity of OER used (35.5%). It is interesting to note that lack of reward and lack of support are not the major barriers to adopt OER in school. It could be Malaysian teachers have higher intrinsic motivation.

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**Table 1. The Respondents’ Profile: Age Group**

**Figure 1. Contribution, Usage, Awareness and Intention to Use OERs**

**Figure 2. Barriers to Adoption of OERs**
Another descriptive analysis that the survey investigate is the level of perceived benefits among teachers. The details are as follows:

Figure 3. Perceived Benefits of OERs

Figure 3 shows that enhancing users’ knowledge is the major benefit of using OER (65.9%). It is interesting to note that reducing development time and cost in OER were not deemed as their priority as benefits.

The study also includes the descriptive data describing the common OERs used by teachers (Figure 4). The details of the breakdown are as follows:

Figure 4. Types of OERs Used by Teachers

The most common OER used by teachers are PowerPoint slides and images (60.9% and 51.4% respectively); only 4.3% of the respondents used podcast. In Malaysia the use of podcast is not popular. The outcome also reflects that the teachers are fond in using OER to improve their lesson presentation and getting ideas in setting assessments. The potential of OER in enhancing the learning and teaching in class has yet to be optimised.

Contributions of the study

The study provides preliminary findings on the use of OER in Malaysian secondary school. It can be used as a basis to formulate policy of implementation on the adoption of OER use in secondary schools in Malaysia. OERs are important and useful resources for teaching and learning. It will help the students to be independent learners at the same time enhance the teachers’ pedagogical skills and knowledge. If the OER are being leveraged effectively then this will bring positive impact to Malaysian education system.

Conclusion

In the Malaysia Education Blueprint 2013-2025 (Preschool to Post-Secondary Education), one of the key aspirations of the Ministry of Education is “to half the achievement gap between urban and rural schools by 2020” (Ministry of Education, 2012). Hence, it is recognised that Malaysia needs to ride on the technology-enabled innovations to democratize the access to education especially for all the rural schools. To this end,
OERs are the way forward. Nevertheless, the Ministry of Education will need to at least initiate the effort to create an OER repository based on the school curriculums and evaluate the quality of the OER compiled to help the teachers in overcoming the major hurdles in using OER.

Acknowledgment

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References

A14

Developing Early Multilingual Literacy Skills with Multimedia Mobile Storybook Reader

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Abstract

This paper introduces the software application Multilingual Mobile Storybook Reader (MMSR) which contains digital storybooks in three different languages (English, Malay, and Chinese), was designed for preschool children to learn multiple languages. This paper describes the design and development of the software application and its objectives. The software was tested and evaluated in terms of feasibility and usability in a pilot test. The pilot test found that the MMSR was user friendly, and parents were motivated to use MMSR to carry out shared reading of multilingual storybook activities with their children.

Keywords: Mobile Assisted Language Learning; Multilingual; Multimedia; Storybook; Scaffolding

Introduction

To accommodate a multi-ethnic society, the Malaysian government has adopted a multilingual education model with the aim of promoting a young generation who will be proficient in at least two languages; English, a compulsory subject in all levels of education, and Malay, the medium of instruction at all national schools and is offered at all levels of education. Chinese and Tamil languages are used in vernacular schools as mediums of instruction. However, this model of multilingual education faces several setbacks which include falling standards of English at all levels and poor performance in Malay among students in vernacular schools. Several measures, such as implementation of a standard Malay language curriculum at the primary school level, providing intensive remedial support for struggling students, up skilling English teachers, and increasing exposure to the languages were introduced to address these issues (Ministry of Education Malaysia, 2013). Parents are engaged to play a more active role in their children’s education. They were provided with online access to their child in-school progress and invited to attend parent-teacher meetings. Research on parental storybook reading shows a positive impact on children’s development and learning (Saracho & Spodek, 2010), and is particularly effective for learning L1 and L2 (Chow, McBride-Chang, & Cheung, 2010). Hence, informal parent-child storybook reading should be encouraged and supported. This paper proposes a mobile learning system, named Multilingual Mobile Storybook Reader (MMSR) to complement the efforts of learning multiple languages. Fashioned in the form of a storybook, it is designed with the aim of developing children’s multilingual literacy skills by providing them greater exposure to multiple languages with adults scaffolding. It also serves as a hub to link homes and schools in a joint effort to develop children’s early multilingual literacy skills. In the context of this paper, multilingual refers to three languages; English, Malay, and Chinese. This paper first describes the guiding principles, followed a description of the format of the storybook and the software as well as the interactive functionalities. Finally, it presents the result of a pilot test.

Background

The design of MMSR is guided by the following core features:-

A. Multimedia Presentation

The Mayer’s Cognitive Theory of Multimedia Learning (Mayer, 2014) indicated that children use their auditory and visual channels in the learning process. A multimedia presentation mode also increases children's
motivation and reading engagement (Ciampa, 2012). Storybooks in multimedia format would support this type of learning process and motivate children to read in multiple languages.

B. Multilingual Presentation

Research evidence indicates that children who begin their education in their first language (L1) make a better start than those whom school starts with a second language (L2) (Chok, 2011). Presenting multiple languages simultaneously enables children who are learning one or more L2 to make reference to their L1 seamlessly. Parents who are not competent in a particular L2 could be supported by the same presentation. In the absence of adults, this feature could also create meaningful interactions that scaffold children’s learning of multiple languages independently.

C. School-parent Communication

The portability, any time and place access, and immediacy of communication afforded by mobile devices expands collaboration opportunities beyond the boundaries of classroom, serving as a hub that link formal and informal setting by facilitating synchronized non-face-to-face school-parent communication.

Multilingual Mobile Storybook Reader

The section describes the format of storybook and the design of MMSR software; a mobile application named MMSR, and a desktop program, named MMSR Manager.

A. Format

A storybook consists of three major components: i) presentation, ii) progress monitoring, and iii) feedback.

Firstly, the presentation component comprises the text of a story and glossary in multiple languages, as well as the audio and visual channel. All texts are stored in XML (Extensible Mark-up Language) format that is structured, and human- and machine-readable. This format also makes storybooks created for MMSR easily transferrable to any platform. The visual channel is enhanced with pictures or animations, while the auditory channel is powered by a Text-to-Speech (TTS) engine and audio files.

Secondly, the progress monitoring component includes the reading log. The reading log records the frequency of storybook reading. Multiple reading logs could be created and each reading log contains information of a reading event: storybook identification number, date, time, and the frequency of the child listening to a narration in a particular language.

Finally, the feedback component enables children to record their feedback after reading each story. Children could rate a story by filling up a digital survey form and provide feedback in the form of an audio clip. Data from each survey form is stored in the XML format and contains storybook identification number, storybook rating, and relationship with reading partner (parent, sibling, or others).

B. MMSR Mobile Application

The MMSR mobile application is designed to operate on the Android operating system as a dedicated multilingual mobile storybook reader. Being mobile, children will be able to read the storybooks several times in different spaces, times, and languages with different reading partners. The home screen of the MMSR presents the list of storybooks made available to children (see Figure 1).
Texts in all the three languages are presented in a consistent manner: first line of text in English followed by Malay and Chinese (see Figure 2). Texts of a story in three languages presented to children simultaneously during parent-child shared storybook reading may help to develop children’s awareness of the oral and written differences of these languages (Kabuto, 2010). Pictures and texts are displayed together to enhance comprehension because it allows learners to make connection between the two media (Clark & Mayer, 2011). A simple and relatively large font is used to enhance reading speed and accuracy of children (Miller & Warschauer, 2014). Audio presentation using a Text-to-speech engine and audio files would enable the children to read stories faster in all three languages (Larson, 2010). MMSR is able to read sentences or individual words to children and thus supports children’s listening and reading, and enable them to learn pronunciation and structure of both their L1 and L2.

Navigation is made simple for children by having all actions performed with a single touch on screen rather than dragging or double-touching. Roskos and Burstein (2013) explained that the touch-based interaction might stimulate children's motivation to read and improve attention because they are multisensory.

New words deemed to be difficult to children are presented in a glossary (see Figure 3). Similar to a dictionary, it might increase children's engagement with and understanding of the texts. Children are able to listen to pronunciation of words in all three languages by clicking on them.

At the end of the reading session, both, children and parents will be prompted to fill up a feedback form (see Figure 4). The feedback serves two purposes: i) support administrative decision on the types, genre or design of story that children prefer to read, and ii) facilitate course delivery by understanding children’s language preferences. The audio recording feature in the feedback form could be used by parents for parent-school communication purposes, making the scaffolding a joint effort between schools and homes.

Data and behaviour on children home reading can be tracked and accurately monitored in the form of reading logs. The reading log provides information on reading behavior and languages preferences (see Figure 5).
The settings page (see Figure 6) allows children to set their names, change font size, and select the language they would like to read. Names of children are recorded for data collection purposes and to create a sense of belonging. A large font size could be set to enhance reading speed and accuracy of children. Children and parents have the autonomy to select the language that they like to read at a particular time and space. If none of the three languages are selected, English is the default language.

### C. MMSR Manager

MMSR Manager is a desktop application developed for transferring reading and feedback logs from the MMSR mobile application. Data retrieved could be compiled and shared with parents and teachers for them to identify children’s motivation towards reading, in terms of the genre of stories and the preferred language of reading.

### Pilot Test

A pilot test was conducted with the aim of identifying the feasibility of multilingual reading on a mobile device, and evaluating the design and usability of MMSR. Two storybooks were made available to five children from three families who participated in the pilot test. The test was conducted at the children’s homes in the presence of their siblings and parents to create a more comfortable environment to ensure the children are at ease and in a supportive environment. A demonstration of MMSR was made for children and parents prior to the pilot test. Observation was made in order to understand how children interacted with MMSR. An interview was conducted to learn about children’s and parents’ opinion of MMSR. Data collected by MMSR mobile application were analyzed to verify that all data recording features were functioning well during run time.
Results and Discussion

The preliminary results from the pilot testing indicated that children were able to use MMSR in the correct manner. They enjoyed interacting with the MMSR and listening attentively to the narrations in all three languages. All children re-read the storybooks several times in all three languages. They also read aloud after listening to the narrations. On several occasions, children listened repeatedly to narration in a L2 before reading aloud. They also referred to their L1 presented simultaneously on the screen when they encountered difficult words in L2. Parents reported that they were motivated to use MMSR to carry out multilingual storybook reading activities with their children. Scaffolding behaviours were observed during the MMSR reading session where adults provide support to children. They encouraged their children to read storybooks in multiple languages by acting as a language translator and providing explanation. This had assisted children to understand a story better. Parents had indicated that texts and narration in all the three languages presented in MMSR supported and motivated them to perform the scaffolding role. Further to the pilot test, the MMSR will be implemented in a selected preschool to identify the effect of the system on children’s motivation toward reading storybooks in multiple languages.

References

Innovative Learning Engagement for ESL Teacher Education Program

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Abstract

Teacher Education of the 21st century demands the teacher education providers to provide enriching learning experiences and platforms which would enable student teachers to build their understanding and make meaning of teaching and learning through the learning processes that they have gone through. Coming from a constructivist point of view, this presentation addresses the approach, teaching and learning principles, strategies and activities employed in enhancing ESL student teachers’ engagement and ability in making meaning on how to learn to teach. This paper highlights the three pedagogical courses used at a teacher education university which serve as the focus for ESL student teachers’ pedagogical professional development as prospective teachers. This study suggests that there should be a shift from a prescriptive to a transformative way of educating student teachers on learning how to teach. A holistic and coherent teacher education curriculum is much needed to ensure the interconnectedness of ideas and practices between courses from the onset until the end of the teacher education program.

Biography

Raja Nor Safinas Raja Harun is an Associate Professor in the English Language and Literature Department, Faculty of Languages and Communication, Universiti Pendidikan Sultan Idris, where she has worked since 2000 and became Dean from 2012 to 2016. Her research interests are mainly on ESL teacher education matters, classroom discourse, English for specific purposes, and ESL innovative pedagogy and methodology. She has graduated quite a number of Masters by research students and soon PhD students. She is currently the Head Project for Curriculum Group under the National Research Grant Scheme (NRGS) for ‘Development of a Teacher Education Model for preparing quality teachers of the Future’. In 2015, she was the recipient for the National Academic Award for Teaching and Learning under the Arts and Social Science Category organized by the Ministry of Higher Education and in December 2015, a research led by her in collaboration with MIMOS, Computer Assisted in English Language Testing (CAELT), won the bronze medal in PECIPTA.
Students Attitude on Academic Help Seeking Behaviour

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Abstract

Learning is an active process where the learners learn, discover certain concepts, principles and facts etc. When the learners are not able to solve their academic problems, they actively seek help from others. The present study aimed to assess the attitude on academic help seeking behavior among nursing students. The study was conducted among 96 first year B.Sc. Nursing students of a selected nursing college. The samples were selected by using non probability purposive sampling technique. A self administered three point likert scale regarding attitude on academic help seeking was used to collect the data. The data was analyzed by descriptive and inferential statistics. The results revealed that majority of the students had favourable attitude towards academic help seeking and none of them had unfavourable attitude. It shows that the students have positive attitude to seek help for their academic problems. Students also responded to some of the factors which hinders them to seek help. The factors influencing the students not to seek help should be considered and academicians must provide exemplary academic support for the success of every student.

Keywords: Academic, attitude, behavior, help seeking, students

Introduction

Seeking help when needed is an inevitable part of the learning process. How effectively the students seek help when they experience academic difficulties can influence their success in the University. Compared to effective help seekers, students who do not clarify with their teachers are not as likely to experience success (Jamie-Lynne Magnusso, Raymond P. Perry, 1992). In a classroom set up, teachers sometimes experience that some students always raise their hands for help whereas, others receive the responses to others questions without asking questions by their own. Some students seek help through online by hitting the "help" button to get the answer but, others seek advice on to solve the problem. These behaviors denote a lot about students attitude on learning and seeking help from others for their subject, and their confidence in getting support from teachers and peers (Sarah D. Sparks. Sarah, 2014).

As far as research in academic contexts is concerned help-seeking has received more attention (Karabenick, S. A.1998, Karabenick, S. A., & Newman, R 2006). Research studies proved that women have significantly more positive attitudes than men in seeking help from professional psychologists (Leong, F. T. L., & Zachar, P.1999, Shea, M., & Yeh, C. J 2008 ). It has been found that affiliation cues like holding hands can influence people to seek academic help (Rubin 2011). Based on the self-regulation framework of learning, people seek help whenever they face any problem which is too difficult for them to solve by their own. Theories of interest and motivation advice the teachers about the ways to attract interest in classroom activities. Educators should keep in mind that sometimes attempts to enhance interest can be irrelevant to learning, but promoting interest in an appropriate way can enhance learning; therefore, educators must be clear about understanding the factors that predict and enhance interest. (Zimmerman, B. J., & Schunk, D. H 1989, Newman, R. S 1990, Bergin 1999). Help-seeking is considered as adaptive and instrumental when the help requested is limited to the assistance who needs to solve a problem independently ( Karabenick, S. A., & Newman, R. S. 2006, 2009).With regard to the perceived benefits and costs regarding academic help-seeking, students may have different attitudes (Karabenick, S. A., & Knapp, J 1991, Ryan, A. M., & Pintrich, P R. 1997). Academic help-seeking is an useful strategy that promotes effective learning and benefits the students in academic excellence. Hence the investigator would like to find out the attitude of students towards academic help seeking behavior by which the investigator can plan remedial measures in future to overcome the barriers for the students to seek academic help.
Research Problem

A study to assess the Nursing students attitude on academic help seeking behavior in selected Nursing College at Mangalore.

Objectives of the Study

1. to assess the attitude on academic help seeking behavior among nursing students
2. to find the association between the attitude and selected demographic variables.

Research Methodology

The research design chosen for the present study is descriptive in nature. The study was conducted among the first year B.Sc Nursing students of a selected Nursing college. Ninety six students from a single class were selected for the study by non probability purposive sampling technique. Approval from the Research centre, Institution Ethics Committee and data collection setting were obtained. Informed consent for the voluntary participation was obtained from the study samples prior to the data collection. The study instrument used to gather the data was divided into two parts as section A and B. Section-A: Baseline Data which includes age, gender, class, area of residence and current living status. Section-B: Attitude Scale on academic help seeking behavior. It is a 3 point Likert scale consists of 18 items scoring from 0-2 (Always - 2 ; Sometimes - 1; Never-0; Q. No. 6-18 reverse scoring) with a total score of 36. The Score is interpreted as Favourable attitude: 25-36, Neutral: 13-24 and Unfavourable attitude: 1-12. The tool was validated by the expert in the field of education and nursing and was pretested. The Self administered attitude scale was distributed to the study samples who were willing to participate in the study. The collected data were analyzed by descriptive statistics and the inferential statistics.

Results /Discussions

The baseline data of the students (Table.1) shows that all the students fall in the category of 18-20 years and majority (97%) were female participants. With regard to their type of family majority (95%) of the students belong to nuclear family. Most (85%) of the students are from urban community and the rest (15%) are from rural area and all the students were staying in hostel. The results revealed that majority (59%) of the students had favourable attitude towards academic help seeking whereas 41% had neutral attitude and none of them had unfavourable attitude (Fig.1). It shows that the students have positive attitude to seek help for the academic problems. The item wise responses show (Table.2) that 82% of the students said sometimes they clarify the doubts with the teacher when they don’t understand the class, whereas 75% responded that they always ask with their friends. A study conducted to assess the Students' academic help seeking from peers revealed that when the children become older, they are less likely to ask help with their classmates to understand certain concepts, but far more likely to get "expedient" help - like copying homework. Expedient help is not cheating, but are like, they just want to finish their homework (Ryan, Allison M.; Shim, Sungok Serena, 2012).

A study tracked when high school students with high and low math skills asked for help on a computer-based geometry-tutoring program. As expected, the students who overused the help by clicking the answer, learned less and students who asked for help priorly on the challenging questions learned more. Students with little knowledge of a particular question learned more when they avoided help and instead tried and failed repeatedly. They also suggested that low-skilled students may not have enough prior knowledge to understand high-level help given (Ido Roll, Ryan S. J. d. Baker, Vincent Alean & Kenneth R. Koedinger, 2014). In the present study eight percent of the students responded that they always approach the teacher for clarification and 41% sometimes meet the teacher and majority (51%) said they never met the teacher to clarify the subject matter. Some of the factors related to not seeking help are discussed here. Five percent felt they always feel shy, 44 % sometimes feel shy and 51% percent said that they never feel shy to ask academic help whereas 45% they never seek help from others even though they have doubt. Majority of them never felt that their teacher (56%) will mistake and classmate (69%) will tease if they ask doubts but, some students always (13%, 7%) and sometimes (31%, 24%) felt that their teachers and classmates will mistake if they ask help, so they don’t ask help. They also felt that they don’t require help as they are sometimes confident (29%) in understanding the class and felt good about themselves (32%).

With regard to the approach ability of teachers, 17% always felt that the teachers are neither approachable nor friendly to seek help 45% sometimes felt and 25% sometimes felt they don’t approach the teachers because they
give importance only to the best students. Six percent of the students expressed that always students were not given opportunity to express their academic problems and 23% said the opportunity was not given sometimes. A study done by Gwen Marchand and Ellen A. Skinner, Portland State University among 765 school children investigated whether motivational resources predicted help-seeking. The results show that the students who were motivated well were seeking good help, whereas who have not motivated concealed their difficulties and failed to seek help. Hence its important that the teacher must be approachable, friendly and motivate the students to achieve higher academic performance (Gwen Marchand, Ellen A. Skinner, 2007). It was also found in the present study that there was no significant association between the baseline data and the attitude on academic help seeking which was analysed by the inferential statistics-Chi-Square.

Contributions of the study

Identifying academic help seeking behavior is beneficial for the students not only to improve their grade or scores, but also to inculcate the academic mindset among them. Academic organizations can conduct induction programs on academic advices to improve the academic help seeking behaviours of students. The faculty, Program advisors or the academic counselor or mentor must regularly interact with the students to find out the barriers to seek academic help and plan certain strategies to overcome the barriers.

Conclusions

The overall result shows that the students have favourable attitude towards academic help seeking. The factors influencing them not to seek help should be considered and as academician we must identify the students who need help and provide exemplary academic support for the success of every student. Academic helpseeking is an useful strategy that promotes effective learning and benefit the students in academic excellence.

Figures/Display Elements:

Table 1. Frequency and percentage distribution of baseline data of the students

<table>
<thead>
<tr>
<th>Baseline data</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in Years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. 18-20</td>
<td>96</td>
<td>100%</td>
</tr>
<tr>
<td>b. 21-25</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>c. 26-30</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>d. Above 30</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Male</td>
<td>3</td>
<td>3%</td>
</tr>
<tr>
<td>b. Female</td>
<td>93</td>
<td>97%</td>
</tr>
<tr>
<td>Type of Family</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Nuclear</td>
<td>91</td>
<td>95%</td>
</tr>
<tr>
<td>b. Joint</td>
<td>5</td>
<td>5%</td>
</tr>
<tr>
<td>Area of Residence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Urban</td>
<td>82</td>
<td>85%</td>
</tr>
<tr>
<td>b. Rural</td>
<td>14</td>
<td>15%</td>
</tr>
<tr>
<td>Current place of living</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Hostel</td>
<td>96</td>
<td>100%</td>
</tr>
<tr>
<td>b. Paying Guest</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>c. Home</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
**Figure 1.** Frequency and percentage distribution of students attitude on academic help seeking

**Table 2.** Frequency and percentage distribution of responses of students to attitude scale N =96

<table>
<thead>
<tr>
<th>Attitude on Academic help Seeking</th>
<th>Always</th>
<th>Sometimes</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>If I don’t understand the class, I clarify with my teacher</td>
<td>11(12%)</td>
<td>79(82%)</td>
<td>6(6%)</td>
</tr>
<tr>
<td>I like to ask my friends if I couldn’t follow the class</td>
<td>72(75%)</td>
<td>22(23%)</td>
<td>2(2%)</td>
</tr>
<tr>
<td>If I have doubt I’ll refer in the library</td>
<td>33(35%)</td>
<td>56(58%)</td>
<td>7(7%)</td>
</tr>
<tr>
<td>I can understand well if I search the information online</td>
<td>23(24%)</td>
<td>67(70%)</td>
<td>6(6%)</td>
</tr>
<tr>
<td>I will meet the teacher after the class and ask for clarification of subject material</td>
<td>8(8%)</td>
<td>39(41%)</td>
<td>49(51%)</td>
</tr>
<tr>
<td>I feel my teacher will mistake me if I ask doubt</td>
<td>12(13%)</td>
<td>30(31%)</td>
<td>54(51%)</td>
</tr>
<tr>
<td>I feel my classmate will tease me if I ask doubt</td>
<td>7(7%)</td>
<td>23(24%)</td>
<td>66(69%)</td>
</tr>
<tr>
<td>I don’t want to express to others that I couldn’t understand the class</td>
<td>4(4%)</td>
<td>74(77%)</td>
<td>18(19%)</td>
</tr>
<tr>
<td>I will not ask anyone even though I have doubt</td>
<td>7(7%)</td>
<td>46(48%)</td>
<td>43(45%)</td>
</tr>
<tr>
<td>I feel shy to seek academic help from others</td>
<td>5(5%)</td>
<td>42(44%)</td>
<td>49(51%)</td>
</tr>
<tr>
<td>I am confident I can understand the class better and doesn’t require help from others</td>
<td>5(5%)</td>
<td>28(29%)</td>
<td>63(66%)</td>
</tr>
<tr>
<td>I don’t have time to approach the teacher</td>
<td>6(6%)</td>
<td>29(30%)</td>
<td>64(64%)</td>
</tr>
<tr>
<td>I don’t seek help as I feel that teachers are neither approachable nor friendly to seek help</td>
<td>17(17%)</td>
<td>43(45%)</td>
<td>36(38%)</td>
</tr>
<tr>
<td>I don’t approach teachers, because they give importance only to the best students.</td>
<td>3(3%)</td>
<td>24(25%)</td>
<td>69(72%)</td>
</tr>
<tr>
<td>I don’t ask help as I feel that students have no opportunity to express their academic problems</td>
<td>6(6%)</td>
<td>22(23%)</td>
<td>68(71%)</td>
</tr>
<tr>
<td>I don’t like to seek help as I am forced to take up this course</td>
<td>4(4%)</td>
<td>24(25%)</td>
<td>68(71%)</td>
</tr>
<tr>
<td>My ailing health problem doesn’t not allow me to seek help</td>
<td>5(5%)</td>
<td>31(32%)</td>
<td>60(63%)</td>
</tr>
<tr>
<td>I don’t require help as I feel good about myself</td>
<td>9(10%)</td>
<td>31(32%)</td>
<td>56(58%)</td>
</tr>
</tbody>
</table>

**References**


Using Action Research to Examine the Effects of Innovative Teaching Aids in Teaching Volleyball Skills During Physical Education Class

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Abstract

The application of action research approach utilizing improvisation and innovation of teaching aids among the physical education (PE) trainee teachers during their teaching practices in schools has result in significant improvements in their students in PE classes. This has let PE trainee teachers to be resourceful, innovative both in thoughts and results. Continuous improvement in PE Program is thus necessary to develop essential capacities of students and teachers. Hence, reflective teaching approach whereby teachers question their teaching must be applied in the teaching of PE. Three action research were implemented in improving students’ learning of volleyball skills with the help of innovative teaching aids: the control and balance aid; hand and arm locking system, analog clock face system. The findings revealed that differentiating PE instruction through innovative teaching aids were imperative in teaching sport skill during PE class. This practices with which the PE teacher uses to establish and maintain student engagement ensure improvement in student’s learning. In addition, innovative teaching aids have helped students achieved the desired outcomes.

Keywords: Action Research; Innovation; Teaching Aids; Physical Education;

Introduction

Action research is for improving practice. The main role of action research is to facilitate teachers to study aspects of practice – whether it is in the context of introducing an innovative idea or in assessing and reflecting on the effectiveness of existing practice, with the view of improving practice (Koshy, 2005; Noraini, 2010). One of the major inputs towards improving the Physical Education (PE) practices have been through the application of action research by integrating the innovation of teaching aids in the Teacher Education Institutions. In Malaysia, PE trainee teachers from the Teacher Education Institute Campuses were required to engage in an action research project in which they would designed and implemented an indirect, developmentally appropriate and child-centred approach in their teaching through improvisation and innovation of teaching aids in PE classes. In addition, the improvisation and innovation of teaching aids in their projects are a necessity in order to focus on the pupils’ understanding and improvement of skills in their respective sports.

Objective

This action research explored the problem of student failure in PE at the research site. The intervention for this study consisted of adjusting the course delivery method in order to improve student success. Specifically, this action was to improve digging skill in volleyball using the hand and arm locking system, control and balance aid and the analog clock system.
Research Problem

In Malaysia, Physical Education Program (PEP) has been linked to numerous negative reports on unhealthy lifestyles, poor eating habits, physical inactivity and the prevalence of obesity (Wee, 2013). This has resulted in constant debate and public scrutiny on the quality of PEP. Despite the support of the Ministry of Education Malaysia in terms of standardized PE curriculum, PE textbooks, and teaching resources, many Malaysian researchers have reported (Wee, Khor & Jamatul, 2004; Wee, 2013) that PE teachers have failed to improve teaching due to various barriers to teaching such as inadequate facilities and equipment, and the lack of pedagogical knowledge. As such the focus on teaching and learning has become more important. Continuous improvement in PEP is thus necessary to develop essential capacities of students and teachers. Therefore reflective teaching approach where teachers question their teaching must be applied in the teaching of PE.

Study

One of the teaching strategy is improvisation of the teaching equipment in the PE classes. The equipments used in a PE session can add to the variety and challenges one give to the students. This enable the trainee teachers to think of alternatives when a particular sports equipment is not available. PE trainee teachers need to be resourceful, innovative both in thoughts and results when faced with these challenges (Lawan, 2005). They would be able to improvise with a locally made item that is a substitute for a commercially made product that is not available because of the high cost associate with it. It can give similar results as the original equipment, demonstrate and explain to the students. In addition, the more improvised equipment made available, the more chance the students have to practice their skills because it enables them to work in smaller groups and have more fun. Improvisation gives room for participation by learners, cost of purchase of facilities and equipment are reduced, makes learners to share equally from the same teaching experiences, makes learning more effective and interesting, promotes the acquisition and longer retention of knowledge and increase the efficiency of the teacher respectively (Ojo, 2010).

Research Methodology

The participants were 8 primary school students (4 boys and 4 girls) aged 11 years from one primary school in Kota Samarahan, Sarawak. Permission was obtained from the headmaster and the physical education teacher. (Refer to table 1).

This initiative involved various steps:

1. Evaluation of volleyball digging skill and underhand serve skill using checklist and identifying student with problem in digging.
2. Brief students on the progression of performing digging skill and underhand serve using the Hand and Arm Locking System, Control and Balance Aid and the Analog Clock Face Aid.
3. Students performed digging and underhand serve skills through digging drill and underhand serve skill which was planned by the teacher.
4. Evaluation was done through-out all the training sessions. Students performed the skill test in pairs with performer passing the ball over the net.
5. Data was collected through observation and checklist. Pretest and posttest scores were recorded.
6. Volleyball digging and underhand serve actions were photographed and video-taped. All the photos and video recording were analyzed with the support of the checklist.
7. Interviews were conducted to get detailed feedback from the students.
8. Log book was used to report all the details of the research.

In the world of PE and sports, teaching aids are necessities to help students and players to learn the proper techniques of the sports. The approaches as indicators and teaching aids will help in simplifying progressions to learn skills at a much faster pace.
The first example is the control and balance aid. The control and balance aid is to enhance the development of the fundamental skills in volleyball. The skills involved are underhand serve, forearm pass (digging) and setting in volleyball. This innovation aid is designed especially for beginner who are learning these skills in the primary schools. (Refer to Figure 1)

This aid helps to reduce the speed of the ball to a point by giving the beginner more time to execute the skills correctly and efficiently according to the skills’ progressions. The aid which is in static position would help the beginner to develop their controlling and balancing skills using their hands, arms, feet and legs while repeating the skills constantly.

The second example is the hand and arm-locking system enable the children and players to learn in a simplified progressive manner whereby they are allowed to learn one step at a time and not to be overloaded by having to concentrate on many things at the same time. (Refer to Figure 2)

The third example is the analogue clock face approach specially adapted for teaching concepts of progressions in volleyball, tennis, taekwondo, badminton and volleyball. The analogue clock face is being used as a form of reference or indicators for the step-by-step teaching progressions that have been used to lead beginners through the various aspects of a skill technique. It is used to simplify the teaching in positioning of stances, point of contact (contact-point), different progressions in sports. (Refer to Figure 3)

Results /Discussions

Based on the action research that have been carried out by the final year trainee teachers, the students have shown progress and attainment in the standards that they were required to achieve in terms of the skills taught, confidence, self-esteem, desire to learn, concentration and time as a result of improving the quality of PE and sport in the schools (Casbon & Walters, 2004). (Refer to Figure 4 to 7)

Findings

The findings are based on the pre and posttest scores of the eight students that have been identified as having problem in executing volleyball digging skill and underhand serve skill. Three sets of pre and posttest scores were collected based on 10 trials of digging per set. The improvement in the digging performance varied from 70% to 90%.

Reflection

It is important to understand the differences among students. For any sport skill instruction in PE classes, teachers must be able to identify those differences and deal with each student one at a time. This action research also revealed that the use of technology could enhance the learning experiences of students and helps improve sport skill performance. The use of innovative technology and materials also help reduced the cost of the equipment used.

Contributions of the study

These innovations and improvisation involve minimal costs which are made from discarded materials or low cost easily accessible materials that can help primary schools to become self-reliant and reduce costs of sports. These aids can be used in primary and secondary school will boost teacher/student creativity and involvement, help institutional budgets go a longer way.

Conclusions

This research described an action research employed in improving students’ learning of a volleyball skill with the help of innovative teaching aids. The findings revealed that differentiating PE instruction is imperative in teaching sport skill during PE class. This practices with which the teacher uses to establish and maintain student engagement ensure improvement in student’s learning. In addition, innovative teaching aids have helped students achieved the desired outcomes.
Sub-theme B: Methodologies and Strategies for Holistic and Enterprising Learning

Table

Table 1. Descriptive statistics of demographic variables

<table>
<thead>
<tr>
<th>Participants’ characteristics</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender:</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>4 (50.0)</td>
</tr>
<tr>
<td>Female</td>
<td>4 (50.0)</td>
</tr>
<tr>
<td>Race:</td>
<td></td>
</tr>
<tr>
<td>Iban</td>
<td>2 (25.0)</td>
</tr>
<tr>
<td>Bidayuh</td>
<td>2 (25.0)</td>
</tr>
<tr>
<td>Melayu</td>
<td>4 (50.0)</td>
</tr>
<tr>
<td>BMI’s levels:</td>
<td></td>
</tr>
<tr>
<td>Underweight (≤ 18.50)</td>
<td>2 (25.0)</td>
</tr>
<tr>
<td>Normal weight (18.51 to 24.99)</td>
<td>6 (75.0)</td>
</tr>
</tbody>
</table>

Figures

**Figure 1.** Control and balance aid

**Figure 2.** Hand and arm-locking system

**Figure 3.** Analog clock face aid
Figure 4. Comparison of pretest and posttest scores in digging on control and balance aid

Figure 5. Comparison of pretest and posttest scores in underhand serve on control and balance aid.

Figure 6. Comparison of pretest and posttest scores in underhand serve on analog clock face aid
Figure 7. Comparison of pretest and posttest scores in digging on hand and arm locking aid

References


B4

Learners’ Awareness Levels Questionnaire: A Brief Discussion on How the Measurement Tool is Developed and Validated

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Abstract

The Learner Awareness Levels Questionnaire (LALQ) was developed to measure how and why Malaysian students learn. From a preliminary measure of learner awareness with 36 items, the LALQ went through three stages to obtain its finalized 21 items. In Stage 1, 21 items were extracted to be significant using exploratory factor analysis. In Stage 2, the analysis provided evidence for a four-factor solution (Survival, Establishing Stability, Approval and Love of Learning). From the structural equation modelling and confirmatory factor analysis in Stage 3, further evidence was obtained to indicate the validity of the LALQ. The final 21-item LALQ helps teachers and education administrators make quick assessments of how and why their students learn.

Keywords: learner awareness; how and why students learn; questionnaire development

Introduction

This paper describes the development of the Learner Awareness Level Questionnaire (LALQ) to measure students’ awareness of how and why they learn. From a preliminary questionnaire of 36 items, the study involved three stages of analysis to improvise the questionnaire to obtain its finalized 21 items.

Research Problem

Questionnaires have been developed to address student learning processes from cognitive psychology especially in information processing theories (Moreno & DiVesta, 1991, Schmeck, Geisler-Brenstein, & Cercy, 1991). However, such a framework seems inappropriate to address a context-dependent issue like student learning (Biggs, 1999), where it encompasses student strategy use such as their approaches to learning, their motives to learn, their perceptions of the task demands as well as the awareness of why they learn (Bell 1993). Further to this, Biggs (1999) notes that how (the approach) and why (the motive) students learn are also dependent on what they had experienced when learning.

A phenomenological study by Choy et al (2014) found that students’ learning falls into four levels: survival, establishing stability, approval and loving to learn. The study was qualitative in nature and focused on the description of student’s awareness of their own learning. These learning levels are subsequently named the learner awareness levels.

A careful search of current research literature did not yield any questionnaire to measure learner awareness. Therefore, it is concluded that the development of such questionnaires will help both teachers and students gain insight into how and why students learn and provide valuable information for teachers when developing teaching materials and facilitating students.

Objectives of the Study

This study aims to construct and validate the LALQ questionnaire that assesses how and why students learn.
Research Methodology

The preliminary measure of the learner awareness questionnaire consisted of 36 items. The items in the preliminary version were generated after reviewing the results from the phenomenological study on students’ learning awareness (Choy et al., 2014) and existing literature on student learning (Biggs and Tang, 2007; Entwistle, 2000; Biggs, 1999).

Each item in the questionnaire consisted of a 5-point Likert scale. It was decided to have the neutral response choice in the questionnaire because the inclusion of this option allowed it to have better psychometric coherence when the items were considered as a whole and it would have little effect on the overall reliability and validity (Dassa et al., 1997).

The 36-item questionnaire was given to five academic staff of a university who did not take part in this study. Their feedback on linguistic ambiguities and other inadequacies in the questionnaire was used to improve the instrument. This new instrument was then named the Learner Awareness Levels Questionnaire (LALQ).

The LALQ was then tested in three stages with voluntary participation of students enrolled in diploma programmes of a university college. In Stage 1, the data went through Exploratory Factor Analysis to assess fit, detect possible factor structure and eliminate non-fitting items. In Stage 2, another round of Exploratory Factor Analysis was performed to further assess the data. The analyses were performed using SPSS (v16). Analyses in Stage 3 were then conducted to determine whether the final LALQ was appropriate for diagnostic purposes with an independent sample through the use of structural equation modelling (SEM) and confirmatory factor analysis (CFA). AMOS (v20) was used to perform the analyses.

Results /Discussions

Stage 1 – Exploratory Factor Analysis

The 36-item LALQ was administered to 172 students (89 female and 83 male) enrolled in Diploma programmes of various disciplines.

Before conducting the Exploratory Factor Analysis (EFA), two indicators were tested for sample appropriateness. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy index was 0.74 while the Bartlett’s Test of Sphericity was significant $\chi^2 = 1877.14, p < 0.0001$. Both tests indicated that the sample and correlation matrix were within an acceptable range for the analysis.

The EFA was then used to assess fit, detect possible factor structure and eliminate non-fitting items. Questionnaire soundness was examined using principal components factor analysis with varimax rotation. The scree plot test and the acceptance of eigenvalues greater than one, together with a comparison of a parallel analysis of an equivalent set of eigenvalues obtained from a random data set of the same size, were used to identify the number of factors likely to be extracted. Only eigenvalues that exceeded the corresponding values from the random data set were retained. Initial analysis with a factor loading of 0.40 was used as the cut off point for variable acceptance. Twelve factors emerged with eigenvalues greater than one, accounting for 65.9 per cent of the variance in the respondents’ scores. Rotation converged after 23 iterations. The first four factors accounted for 37.5 per cent of variance in the respondents. The eigenvalues of these four factors when compared using the parallel analysis of an equivalent random data set, were higher. Based on the results of the analysis, it was decided that a criterion loading of higher than 0.45 would be used to select items for further analysis. This yielded 21 items with loadings ranging from 0.45 to 0.79. Therefore, 21 of the original 36 items were selected for further testing.

Stage 2 – Second Exploratory Factor Analysis

A group of 331 Diploma students (178 female and 153 male) participated in this stage.

The KMO measure of sampling adequacy (0.80) and the Bartlett’s test of Sphericity ($\chi^2 = 2009.22, p < 0.0001$) met the required standards for exploratory factor analyses. EFA’s principal-axis factoring with varimax rotation of the 21 items yielded four factors with loadings ranging from 0.42 to 0.86. Eigenvalues greater than one accounted for 51.5 per cent of the variances in the students’ scores. Rotation converged after 23 iterations. The first four factors accounted for 37.5 per cent of variance in the respondents. The eigenvalues of these four factors when compared using the parallel analysis of an equivalent random data set, were higher. Based on the results of the analysis, it was decided that a criterion loading of higher than 0.45 would be used to select items for further analysis. This yielded 21 items with loadings ranging from 0.45 to 0.79. Therefore, 21 of the original 36 items were selected for further testing.
into any of the four awareness levels: survival, establishing stability; approval and loving to learn. In the four factor solution, items related to the four awareness levels clearly loaded into each of the factors. It was parsimonious and provided a better interpretation of students’ awareness of how and why they learn. Hence, the four factor solution was accepted and the factors were subsequently labelled as Survival, Establishing stability, Approval and Loving to learn.

**Stage 3 – Structural equation model formation and model testing**

The purpose for Study 3 was to determine whether the 21-item LALQ was suitable for diagnostic purposes with an independent sample through the use of structure modelling (SEM) and confirmatory factor analysis (CFA). As in Study 2, the Cronbach alpha was also determined at this stage.

An independent sample of 356 students took part in the analysis with 180 female and 176 male.

Data from the 21-item questionnaire were examined using AMOS (v20) to test the dimensionality and goodness of fit of the model. Two models were developed and tested for their fit to the data. They were a four-factor baseline model and a four factor hierarchal model. The two models that were tested using CFA and AMOS are shown in Figure 1. The four latent variables are survival, establishing stability, approval and loving to learn.

**Figure 1. Structure of the Baseline and Hierarchical Models**

![Figure 1a Baseline Model](image1)

![Figure 1b Hierarchical Model](image2)

Figure 1a represents the baseline model. This represents the most parsimonious and best fitting for the data of a particular group and is the independence (null) model (Kline, 2011) which assumes zero covariances among manifest variables. However, in reality, association between latent factors and manifest variables may occur. Figure 1b represents the hierarchical model. This model represents the hypothesis that a higher order (second-order) factor in this case ‘learner awareness’ has a presumed direct causal effect on the four lower order (first-order) factors of survival, establishing stability, approval and loving to learn. The second order factor is indirectly measured through the indicators of the first order factors.

The model fit for the two hypothesised models were evaluated using multiple fit indexes provided by AMOS. One of the evaluations used was to generate the CFA using the ratio of the chi-square, $\chi^2$ to the degrees of freedom ($\chi^2$/df). The lower the ratio the better the model fit. Kline (2011) recommended a number less than three as a reasonable indicator of good fit, although ideally the ratio should be close to one. However, this rarely happens if the models are complex and use item level data (Byrne, 2001). Other goodness of fit indices used to assess the adequacy of model fit include the goodness of fit index (GFI), comparative fit index (CFI), and the root mean square error of approximation (RMSEA). Kline (2011) and Hu and Bentler (1998) recommended that values greater that 0.900 would indicate a reasonable to excellent fit for both GFI and CFI indexes. The RMSEA value is useful because it is not associated with the latent variable and can be used to obtain parametric confidence level and perform hypothesis testing (Kelly & Lai, 2011). It was recommended that a cut off value of 0.06 will indicate a relatively good fit (Hu & Bentler, 1998).

The indices of the two hypothesised models showed reasonable fit. However, the hierarchical model had better fit indices than the baseline model. It had a lower $\chi^2$/df ratio of 1.62 with a p-ratio of 0.00 and had better indices for the rest as well (RMSEA = 0.043, GFI = 0.937 and CFI = 0.943). Hence, a general learner awareness factor is presumed to underlie the more specific factors of survival, establishing stability, approval and loving to learn.
In order to estimate internal consistency, the Cronbach’s coefficient alpha (α) was determined for the sample (n = 356). The internal consistency for the four LALQ factors were as follows: survival (9 items), α = 0.76, establishing stability (4 items), α = 0.73, approval (4 items), α = 0.53 and loving to learn (4 items), α = 0.78. Although the α for approval is relatively low, the mean inter-item correlation is 0.22 which is within the optimum range of 0.2 to 0.4 (Pallant, 2011).

**Contributions of the study**

This study detailed the three stages of developing and validating the LALQ of 21 items intended to measure learners’ awareness of their learning based on 4 factors: Survival, Establishing Stability, Approval, and Loving to Learn.

**Conclusions**

The 21-item LALQ is developed for quick administration and analysis so that there is easy access to information that will be useful both to the teachers and the learners.

Further testing of the LALQ needs to be carried out with other populations to gauge other aspects not tested in this study.

**References**

B5

A Preliminary Investigation on How and Why Malaysian Hospitality and Tourism Management Students Learn

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Abstract

This paper examines how and why hospitality management students learn in Malaysia. It makes a comparison between students’ approaches to learning from two campus locations. The LALQ, a self-report measure of student approaches to learning was used to obtain the data. Pearson's product-moment correlations and t-tests were carried out to study the differences in the two populations of students. The results showed that there were significant correlations and differences between students from the two campuses. Students from the urban campus were more likely to be intrinsically motivated in the way they approach learning while those from the rural campus were more likely to be extrinsically motivated given that they depend on significant others to influence their lives and learning approach. The implications of the differences in students’ approaches to learning were also discussed.

Keywords: Hospitality Management Students, Learning, Learning Approaches.

Introduction

The trend in many classrooms today is to implement outcome based learning which emphasises student-centred approaches with the intention of creating an environment where the student experience is meaningful and successful. The aim of this is to encourage deep learning (Biggs, 1999) which requires students to actively participate and claim ownership of their learning. One missing element, however, in the haste to implement strategies and approaches to bring this about is not giving consideration to the personal thoughts and feelings of the individual that carries it out. As Tyler (1949), very succinctly wrote in his book Basic Principles of Curriculum and Instruction, sixty years ago, students learn through what they do and not what the teachers does. The teacher’s task is to get students to engage in behaviours that will bring about the desired learning. The student’s participation and cooperation is most important. However, for this to occur students must have a certain level of awareness of why and how they learn before they can actively cooperate with the learning process. This cooperation is not possible when students’ feelings and thoughts are not in tandem with what they are expected to learn. This is especially true for students in hospitality and tourism management (HTM) related programmes where many of the courses are skills based.

This paper reports a preliminary study of undergraduate HTM students on how and why they learn which will include the strategies they use and their learner awareness levels. The study using the Learner Awareness Level Questionnaire (LALQ), developed and validated by Choy, Goh and Sedhu (2015) attempts to determine the differences, if any, in learning strategies and the awareness levels of students from the two campuses. Comparisons of the scores from the awareness levels of the two groups of students will be carried out using correlations and t-tests will be used to determine its significance.

Learner Awareness

Understanding the learning behaviour of students is crucial to setting up teaching and learning strategies that enhances the student experience (Dale & McCarthy, 2006). However, an understanding of how and why individuals learn specifically HTM students has received scant attention from academia (Hsu, 1999). This is further complicated by higher education institutions taking in students from wide and varied fields, cultures and backgrounds into such programmes. Adding to the problem, students also tend to be more extrinsically
Students strive to achieve a level of stability in their lives. ‘Approval’ is the need to belong and to please others. Awareness levels: survival, establishing stability, approval, loving to learn will also be determined. ‘Survival’ is stressed in the classroom. Attempts to establish a general framework of how students learn using the cognitive and affective aspects have been inconclusive on the usability and applicability of such a framework.

This paper investigates the approaches HTM students use to learn measured using the LALQ. The four learner awareness levels: survival, establishing stability, approval, loving to learn will also be determined. ‘Survival’ is stressed in the classroom. Attempts to establish a general framework of how students learn using the cognitive and affective aspects have been inconclusive on the usability and applicability of such a framework.

Research Problem

This paper investigates the approaches HTM students use to learn measured using the LALQ. The four learner awareness levels: survival, establishing stability, approval, loving to learn will also be determined. ‘Survival’ is their awareness of having to adapt and survive everyday learning situations. ‘Establishing Stability’ is the students’ strive to achieve a level of stability in their lives. ‘Approval’ is the need to belong and to please others.
through their actions and ‘Loving to Learn’ is their motivation to acquire new learning and skills to build on existing knowledge.

**Objectives of the Study**

Underpinning the research will be the following objectives:

1. To determine the four learner awareness levels (LAL): survival, establishing stability, approval, loving to learn present in HTM students.

2. To determine significant differences, if any, in the LAL scores of students from a rural and an urban campus environment.

**Research Methodology**

**Participants**

Students in this study were from the HTM division of two campuses, one urban and the other rural in Malaysia. The urban campus is in Kuala Lumpur, the capital city and the rural campus is 40km from a large city.

The students in the campuses were enrolled in the HTM degree and diploma programmes. The sample consisted of 359 students, with 127 from the urban campus and 232 from the rural campus. Of the 127 students from the urban campus, 74 were from the bachelor programme and 53 were from the diploma programme. All 232 students from the rural campus were from the diploma programme.

The urban sample consisted of 83 female and 44 male students. The age range of the sample was between 18 to 26 years. The response rate from these students was 96%. The rural sample had 131 female and 101 male students. The age range of the sample was between 18 and 22 years. The response rate of the students was 98%.

**Procedures**

The informed consent of these students was obtained and they were assured that the information they provided will only be viewed by the researchers and they will remain anonymous. As participation was on a voluntary basis they were told they could withdraw from the research at any time. The questionnaire was given to students between their classes. Most of the questionnaires were returned before the start of the next class.

**Materials**

The LALQ developed and validated by Choy et al (2015) was used in this study. The questionnaire consists of 21 items that measure the four learner awareness levels: Survival, Establishing Stability, Approval and Loving to Learn. The LALQ was designed to provide quick useful information about student learning. Respondents were asked to identify on a five-point Likert scale (5 for Strongly agree, 4 Agree, 3 Neutral, 2 Disagree and 1 Strongly disagree). The questionnaire was administered using paper and pencil.

**Results/Discussions**

The data was subjected to test of normality. The Skewness value of .40 and the Kurtosis value of 1.86 were within the criteria for normal distribution (Hair et al, 2006). The first objective in this study was to determine the four LAL present in HTM students. The results of the LAL for the two groups of students as well as the overall scores of the students from both campuses are shown on Table 1.

<table>
<thead>
<tr>
<th>LAL</th>
<th>Survival</th>
<th>Est. Stability</th>
<th>Approval</th>
<th>Loving to Learn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban Students</td>
<td>2.39</td>
<td>3.77</td>
<td>3.44</td>
<td>3.64</td>
</tr>
<tr>
<td>Rural Students</td>
<td>2.50</td>
<td>3.81</td>
<td>3.11</td>
<td>3.03</td>
</tr>
<tr>
<td>Overall</td>
<td>2.46</td>
<td>3.80</td>
<td>3.23</td>
<td>3.24</td>
</tr>
</tbody>
</table>

*Table 1. LAL scores for Urban and Rural Students.*
The LAL scores showed that HTM students from the urban campus scored lower for survival than students from the rural campus indicating that they were less likely to approach learning as a means of survival which according to Choy et al (2015) indicated the perceived need for control over learning situations and the influence of significant others on why they learn, implying that HTM students from the rural campus were more likely to learn because of influences from significant others in their lives and perceived they had less control over their learning situations. It must be noted that 46.2% of students from the rural campus compared to 33.1% from the urban campus agreed with the following statement about ‘Survival’: ‘I give up easily especially when I feel the subjects are difficult’. This is the only statement on the LALQ for the survival scale that showed this trend.

The group of HTM students from the rural campus scored 3.81 for ‘Establishing Stability’ while those from the urban campus scored 3.77. This suggested that students from the rural campus were more likely to learn in order to establish a better future than the students from the urban campus. 37.8% of the rural campus students compared to 28.7% of the urban campus students agreed with the following statement about ‘Establishing Stability’: ‘I will just memorise my notes rather than analyse them in order to pass examinations’. Students from both campuses showed similar trends in their responses for the other statements.

Students from the urban campus scored 3.64 for ‘Loving to Learn’ while students from the rural campus scored 3.03. This suggested that students from the urban campus were more motivated to acquire new skills and building on existing knowledge than those from the rural campus. There were more students from the urban campus agreeing to the statements for this level than those from the rural campus. For the statement: ‘I feel confident I can pass my examinations with good grades’ showed 56.7% of students from the urban campus agreed with the statement compared to 31.1% from the rural campus. For the second statement: ‘I think I will have more friends if I do well in my studies’, 37.8% of students from the urban campus agreed with the statement compared to 16.9% of students from the rural campus.

The second objective was to determine significant differences, if any, in the LAL scores of HTM students from the rural and urban campus. In this study we hypothesise that students from the rural campus would have higher survival and establishing stability scores than urban campus students as they may perceive fewer opportunities available to them. However, students from the urban campus would have higher approval and loving to learn scores as their learning environment may be more varied and enriching which enhances the learning experience. Correlations were computed in order to examine the interactions between the scales of the LALQ and campus location. Finally, a t-test was used to determine the difference, if any, between the two groups of students. In order to explore these relationships, Pearson coefficients were calculated (Table 2).

There was a small negative correlation between ‘survival’ and campus location, $r = - .16, n = 359, p < .01$, with the urban campus associated with low ‘survival’ scores. In the relationship between ‘approval’ and campus location, $r = .24, n = 359, p < .01$, there was a small, positive correlation between the two variables with the urban campus associated with high ‘approval’ scores. There was also a small, positive correlation between ‘loving to learn’ and campus location, $r = .37, n = 359, p < .01$, with the urban campus associated with high ‘loving to learn’ scores.

<table>
<thead>
<tr>
<th></th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Survival</td>
<td></td>
<td>- .05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Establishing Stability</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Approval</td>
<td>- .03</td>
<td></td>
<td>.31**</td>
<td></td>
</tr>
<tr>
<td>4. Loving to Learn</td>
<td>- .27**</td>
<td>.30**</td>
<td>.45**</td>
<td></td>
</tr>
<tr>
<td>5. Campus Location</td>
<td>- .16**</td>
<td>.04</td>
<td>.24**</td>
<td>.38**</td>
</tr>
</tbody>
</table>

**Note**: **p < .01**

*Table 2*. Pearson product-moment correlations between the scores for the four scales of the LALQ and campus location.
An independent-samples t-test was conducted to compare the ‘survival’ scores for the two campus locations. The Levene’s test of homogeneity of variance indicated equal variances was assumed for ‘Survival’, ‘Approval’ and ‘Loving to Learn’ while equal variances was not assumed for ‘Establishing Stability’ and the appropriate t-value obtained.

There was a significant difference in scores for students from the rural campus ($M = 2.51, SD = .50$) and urban campus ($M = 2.33, SD = .54$); $t(359) = 2.99, p = .003$, two tailed). The magnitude of the differences in the means (mean difference = .18, 95% CI: .06 to .30) was small (eta squared =.008).

There was also a significant difference in the ‘establishing stability’ scores for students from the two campus locations for the independent samples t-test. For this score, students from the rural campus ($M = 3.78, SD = .60$) and urban campus ($M = 3.84, SD = .46$); $t(359) = -.91, p = .36$, two tailed). The magnitude of the differences in the means (mean difference = -.06, 95% CI: -.17 to .06) was small (eta squared =.001).

The last two scores ‘approval’ and ‘loving to learn’, also had significant differences for students in the rural campus and urban campus when the scores were compared using the independent-samples t-test. For the ‘approval’ scores students from the rural campus ($M = 3.14, SD = .59$) and urban campus ($M = 3.47, SD = .60$); $t(359) = -4.59, p = .00$, two tailed). The magnitude of the differences in the means (mean difference = -.32, 95% CI: -.46 to -.18) was small (eta squared =.001). For the ‘loving to learn’ scores students from the rural campus ($M = 3.07, SD = .73$) and urban campus ($M = 3.72, SD = .70$); $t(359) = -7.59, p = .00$, two tailed). The magnitude of the differences in the means (mean difference = -.65, 95% CI: -.82 to -.48) was small (eta squared =.001).

The results showed that there were significant differences in how and why HTM students learn for the rural and urban campuses. There was also a small but significant correlation between ‘survival’ ‘approval’, ‘loving to learn’ and campus location. ‘Survival’ had a negative correlation with campus location while the other two had positive ones. The negative correlation between ‘survival’ and campus location implied that students in the rural campus tend to approach learning in order to please their significant others and believed that they had less control over their learning than those from the urban campus. This finding does not support Hsu and Wolfe’s (2003) research that suggested students were less people oriented. For the rural campus students at least, they were willing to be influence by significant other in their lives, implying that were people oriented.

The positive correlation between ‘approval’, ‘loving to learn’ and campus location implied that urban students learned in order to impress their friends and had greater confidence to graduate on time suggesting they were more extrinsically motivated which supports findings by Hsu (1999). These students found learning interesting and enjoyable similar to results found by Dale and McCarthy (2006) on learning styles among HTM students. Hence, students will develop a love for what they learn as long as they find learning meaningful.

Contributions of the study

As stated at the beginning of this paper, there is a dearth of studies into student approaches to learning among HTM students. Hsu (1999) noted that studies into learning among HTM students were further complicated by culture as well as the varied backgrounds of HTM students. The results of this study will contribute to increasing knowledge about students’ approaches to learning for HTM programmes. It will also further provide important information to help enhance the delivery of such programmes.

Conclusions

The results of this study showed that there were differences in approach to learning for HTM students’ from different campuses. Students from the rural campus seemed less confident about passing examinations and were more likely to be influenced by significant others in their lives. In contrast, those from the urban campus were more confident about reaching their learning goals. They were also more likely to build new skills and add on to their existing knowledge. The urban students seemed more confident overall than the rural students.

There was a difference in the scores for the four LAL scales with students from the rural campus scoring higher for ‘establishing stability’ than those from the urban campus. However, students from the urban campus scored higher for the other three scales. It was not clear from the results whether the difference in scores was due to the overall learning environment in the campuses or the programmes the students were enrolled. Further studies need to be conducted on the factors that determined the differences in the scores.
References


A Comparison of Malaysian and American Learners’ Behaviour: The Mediating Role of Learners’ Awareness

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Abstract

The mediating role of learners’ awareness on learner behaviour was determined using the 21-item Learner Awareness Levels Questionnaire (LALQ) and structural equation modelling (SEM) using data from 2646 Malaysian students and 316 American students. The results suggest that student approaches to learning for the Malaysian and American samples were different. Learner awareness was related to affective learning for Malaysian students while for American students it was related to cognitive learning. Learner awareness partially mediated learner behaviour for both cognitive and affective learning among Malaysian students while it fully mediated learner behaviour for cognitive learning among American students.

Keywords: student approaches to learning, structural equation modelling, mediation, LALQ, student learning

Introduction

The LALQ (Choy, Goh, Sedhu, 2015) a self-reporting questionnaire was developed and validated to measure the learning approaches of Malaysian students. The current study is interested in determining the similarities in approaches to learning with Malaysian and American students using the LALQ. This paper will report on the comparison of student approaches to learning between the two countries.

Research Problem

Rather than allowing students to learn at their own pace, teachers control the pace of learning through their lessons which are closely based on the syllabus that needs to be taught. In many instances, perhaps in the East more than the West, students continue to be passive learners who extensively use rote learning to help learn course content (Hiew, 2012). This finding is refuted by Kember (2000) who argues that passivity is due to the teaching strategies used in schools and universities and, given a context that encourages participation in class, students can become active learners. Passivity among Asian students is still a point of contention with educators. Many published articles by Asian researchers find evidence of passive and rote learning among students in their classrooms. In Western societies, the United States specifically, there has been a push to promote a more learner-centred, active approach to instruction. The current study recognises that while learning strategies are important, students’ awareness of approaches to learning may mediate learning.

Learning occurs when individuals use a combination of affective, cognitive and psychomotor (behaviour) learning (Hall, 2011). It is a process which results in the continued growth and change in students and determines how information is taken in and connected into something that is meaningful. Within the three aspects of learning are multiple levels of learning that progress from the basic surface learning to more complex deep learning (Kember, 2000). Students often use these three aspects of learning without being fully aware of them. As students learn they interact with the world and hence change their conception of things, expanding their awareness through the process. Entwistle (2000) suggests that the end result of a process of broadening the
awareness of the nature of learning may involve students having a fully developed conception of learning, being aware of the different contexts to which the learning can be used and being able to adapt it to their learning behaviour.

A main theme in the study of learning approaches has been their connection to personality factors. The examination of this relationship has yielded divergent findings in American and international students (e.g., Dutch, British, Scottish, and Canadian). Of the Big Five, conscientiousness, extraversion and openness to experience have on balance primarily yielded positive associations with academic success whereas neuroticism appears rather consistently associated with lower academic success (Busato, Prins, Elshout, & Hamaker, 2000; O’Connor & Paunonen, 2007). These studies implied that certain awareness factors could play a role in learner behaviour. Therefore, a cross-cultural study on the mediating role of learner awareness of learning behaviour will add to the existing knowledge on student approaches to learning.

**Objectives of the Study**

This article reports on the mediating role of learners’ awareness on learning behaviour among Malaysian and U.S. undergraduates. The following conceptual framework will underpin the study:

![Conceptual Framework]

The following research questions were formulated as a guide:

RQ1: Does Affective Learning (AL) have a significant effect on Learner Awareness (LA)?
RQ2: Does Cognitive Learning (CL) have a significant effect on Learner Awareness (LA)?
RQ3: Does Learner Awareness (LA) have a significant effect on Learner Behaviour (LB)?
RQ4: Does Learner Awareness (LA) mediate the effect of Affective Learning (AL) on Learner Behaviour (LB)?
RQ5: Does Learner Awareness (LA) mediate the effect of Cognitive Learning (CL) on Learner Behaviour (LB)?

In this study Learner Behaviour (LB) is defined as the behaviour students exhibit when they are learning. Cognitive Learning (CL) consists of the perceptions of and reasons why they learn. Affective Learning (AF) is the feeling students have when they learn or are learning. While Learner Awareness (LA) is the awareness students have of why and how they learn.

**Research Methodology**

As the 21-item questionnaire had been validated using a Malaysian student population, it was given to a review group of 10 native speakers of American English to ensure the questionnaire could be understood by an American student population. These students were representatives of the population who evaluated the flow and vocabulary of the original survey for ease of comprehension. As a result, changes in vocabulary and syntax, not content, were made in order to adjust the original survey to standard American English and facilitate comprehension of the survey by American students.

The 21 item LALQ was administered to 1626 Malaysian undergraduate students (1761 females and 884 males) enrolled in various bachelor programmes as a paper-and-pencil test. In the U.S. it was administered online to 316 undergraduate students (258 female and 58 male) enrolled in various bachelor programmes in an American University. The students came from a number of faculties and were all full time students. All the students were told that they could withdraw from the study at any time they wished and the data they provided would be kept confidential. The data were then encoded and entered into SPSS (Version 16) for initial analysis.
Research questions were tested with AMOS 21, while the mediation analysis adopted Baron and Kenny (1986) conditions which determined mediation if there was (a) significant association between the independent variable and the dependent variable, (b) significant association between the independent variable and the mediator variable, (c) the proposed mediator significantly predicts the outcome, and lastly (d) the association between the initial variable and the outcome variable was attenuated after controlling for the proposed mediator. In addition, the bootstrap method was employed to develop accurate estimates of standard error of the indirect effect with 2000 bootstrap samples. If the 95% Confidence Interval (CI) for the estimate of the indirect effect did not include zero, the effect concerned was considered statistically significant at the .05 level (Shrout & Bolger, 2002).

Results /Discussions

**EFA for Malaysian and American Students**

Before conducting the Confirmatory Factor Analysis (CFA) for the Malaysian (M) and American (A) samples, two indicators were tested for sample appropriateness for such an analysis. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy index was 0.88 for M and 0.87 for A, and Bartlett’s Test of Sphericity was significant $\chi^2 = 1974.14, p < 0.001$ for M and $\chi^2 = 2714.49, p < 0.001$ for A, indicating that the samples and correlation matrix were within an acceptable range for the analysis. Only eigenvalues that exceeded the corresponding values from the random data set were retained. Initial analysis with a factor loading of 0.50 was used as the cut off point for variable acceptance. Five factors emerged with eigenvalues greater than one, accounting for 60.3 per cent of the variance in the respondents’ scores. Rotation converged after 6 and 5 iterations for M and A samples respectively. The first four factors accounted for 55.5 and 64.0 per cent of variance in the M and A respondents respectively. The eigenvalues of these four factors when compared using the parallel analysis of an equivalent random data set, were higher. Based on the results of the analysis, it was decided that a criterion loading of higher than 0.45 would be used to select items for further analysis. This yielded 21 items with loadings ranging from 0.50 to 0.93.

**Confirmatory Factor Analysis for Malaysian and American Students**

The four factor solution seemed to be parsimonious and provided a better interpretation of the aspects of student approaches to learning. Hence the four factors were named ‘Learner Behaviour’, ‘Cognitive Learning’, ‘Affective Learning, and ‘Learner Awareness’. Reliabilities (α) for each of the factors were: M: .84, A: .89 for ‘Learner Awareness’, M:.79, A:84 for ‘Learner Cognition’, M:.83, A:.70 for ‘Learner Affect’, and M:.60, A:.82 for ‘Learner Behaviour’. Although the Cronbach alpha value for ‘Learner Behaviour’ for the M sample was relatively low, the mean inter-item correlation for the factor was between the optimal range of 0.2 to 0.4 (Pallant 2011).

The four factors were hypothesised to vary with each other. An examination of the goodness of fit for the four-factor model and the final analysis showed that the model is acceptable. In order to compare the goodness of fit for the model, maximum likelihood estimation, a technique commonly used for CFA (Pallant, 2011) was used as there were no universally accepted set of criterion to prove model fit. The initial SEM model did not show acceptable GOF indices and several modifications were made. Several accepted goodness-of-fit (GOF) indexes were computed for the initial SEM model and the final SEM model as shown in Table 1.

Based on the measurement model and fitness index measurement Tables 2 and 3 present the results for the five RQs.

<table>
<thead>
<tr>
<th>GOF Indices</th>
<th>Recommended Guidelines*</th>
<th>Malaysia Model</th>
<th>US Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-square ($x^2$)</td>
<td>The least</td>
<td>1557.89</td>
<td>154.71</td>
</tr>
<tr>
<td>Degrees of freedom</td>
<td>$\geq .05$</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>$p$ value</td>
<td>$\leq .10$</td>
<td>.04</td>
<td>.07</td>
</tr>
<tr>
<td>RMR</td>
<td>$\leq .08$</td>
<td>.04</td>
<td>.07</td>
</tr>
<tr>
<td>RMSEA</td>
<td>$&gt; .80$</td>
<td>.97</td>
<td>.88</td>
</tr>
<tr>
<td>GFI</td>
<td>$&gt; .80$</td>
<td>.96</td>
<td>.87</td>
</tr>
<tr>
<td>NFI</td>
<td>$&gt; .90$</td>
<td>.97</td>
<td>.92</td>
</tr>
<tr>
<td>IFI</td>
<td>$&gt; .80$</td>
<td>.88</td>
<td>.85</td>
</tr>
</tbody>
</table>

Table 1 The GOF indices for the final model for Malaysian and American samples (Brown & Cudeck, 1993)
Table 2 shows the results of the hypothesis testing of RQ1, RQ 2 and RQ3 for the two samples. From the results, affective learning had a significant influence on LA ($\beta = -0.14$, $p < 0.0001$) for the Malaysian sample but not for the American sample. CL had a significant influence on LA ($\beta = -0.55$, $p < 0.001$) for the American sample but not for the Malaysian sample. However, learner awareness had a significant influence on LB for both samples with $\beta = 0.15$, $p < 0.001$ for the Malaysian sample and $\beta = -0.37$, $p < 0.001$ for the American sample. It is interesting to note that for the Malaysian students an increase in LB will increase LA. However the opposite is true for the American sample, an increase in LA will decrease LB.

Table 3. Mediation Testing Results

RQ4 tested the mediation effects of LA on the relationship between AL and LB. It was found that LA partially mediated the Malaysian model and did not mediate the US model. This finding is then further supplemented using the Bootstrap method for testing indirect effects which indicated significant indirect effect of AL on LB through LA (CI: -0.17, -0.10), $\beta = 0.02$, $p < 0.001$ for the Malaysian model and insignificant (CI: -0.06, 0.05), $\beta = 0.002$ (ns) for the US model. That is learner awareness influenced both affective learning and learner behaviour for Malaysian students but not American students.

For RQ5, LA partially mediated the Malaysian model and fully mediated the relationship between CL on LB for the US model. The indirect effects of CL on LB through LA were significant for both the Malaysian model (CI: -0.31, -0.12), $\beta = -0.30$, $p < 0.001$. Hence, cognitive learning and learner behaviour in Malaysian and American students, for these samples at least were influenced by learner awareness.

Limitations

There are some specific methodological limitations to the present study. Firstly, how and why students learned was measured using a self-report instrument, which was not context specific. However, there are differing points of view from researchers on this. Pintrich (2003) recommends adapting a questionnaire to suite the course rather than being overly global while Heikkila and Lonka (2006) recommend a more general and non-context driven questionnaire to measure student approach to learning. Because this study is explorative, cross-disciplinary and intercultural in nature, the LALQ used is suitable for students that come from various faculties and departments.

It must be noted that the data were collected from students of various faculties and programmes and many contextual aspects having to do with students’ specific study culture were ignored. Future studies will need to look at the learning approaches of students from various social and cultural aspects which will be more contextual and grounded in the use of specific strategies. Attempts are also made to avoid interpretations of the data from the current study that will reflect seeing approaches and strategies as trait-like entities. The
interpretations are from a more systemic view and the approaches to learning in terms of the adaptations to a learning environment. This does not mean that students will exhibit similar predispositions across all learning environments nor does it mean that it is unchangeable. Hence, there is clearly a need for a longitudinal study to determine causality which cannot be made with the correlational evidence of the current study. Pintrich (2003) further encouraged more rigor in research methodologies, more reliable behavioural measures, and developmental research. Hence, new methodologies and measuring instrumentation are needed, representing great opportunities for future studies.

**Contributions of the study**

The knowledge obtained from this study will allow a deeper understanding of the needs of students from the Malaysian and American societies. It will also create a platform for mutual understanding of the uniqueness of the two cultures.

**Conclusions**

The results suggest that student approaches to learning for both the Malaysian and American samples were different. Learner awareness was influenced by affective learning for Malaysian students while for American students it was influenced by cognitive learning. This could be explained by the differences in cultural practices of the two countries. According to Picard, et al. (2004), affective learning is about the emotions involved in the process of learning. With Malaysia being a more collectivist society the process of knowing ‘how to do’ hence how to develop a love of learning is more important (Hofstede, 2001). For American students who are highly individualist, learning is a more cognitive process where the learning process needs to change with the context they are in (Hofstede, 2001), hence more likely to be seen as a coping mechanism.

Learner awareness partially mediated affective learning and cognitive learning on learner behaviour for Malaysian students. However, learner awareness fully mediated cognitive learning for American students. Hence for Malaysian students, learner awareness will have some influence on their approaches to learning resulting in changes in their learner behaviour. For American students, only cognitive learning influenced learner awareness resulting in changes to their learner behaviour. Therefore, for this sample at least, cognitive learning influenced learner awareness which in turn influenced the learner behaviour of American students.

**References**


Effectiveness of Cooperative Learning in Developing Linguistic Competence of College Students

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Abstract

This study sought to identify the effectiveness of cooperative learning strategies in developing linguistic competence of college students. The 105 subjects of this study were taken from two sections of first year students enrolled in Grammar and Composition 2. This study used the pseudo-experimental method using the repeated measures design. Correlation T-Test was used to compare the mean scores on the pretest/posttest of achievement tests and attitudinal inventory tests, and Pearson Moment Correlation was used to determine the correlation between the mean scores on achievement tests and attitude towards the methods employed. Findings show that both methods can develop linguistic competence of students, but cooperative learning has a higher mean gain score as compared to the lecture-discussion method. Though “cooperative learning” and “lecture-discussion method” can enhance favorable attitude, cooperative learning strategy has influenced greater positive attitude on the learner as compared to the lecture-discussion method. There is no correlation between linguistic competence and attitude towards cooperative learning strategy and lecture-discussion method.

Keywords: Cooperative Learning, Lecture-Discussion Method, Linguistic Competence

Introduction

The 21st century has pushed innovations in the teaching-learning process to attune into the demands of the present generation. At present the focus of education is shifted “from what to teach to how to teach”. The use of approaches that would best deliver the desired objectives must be employed. The search for efficient and effective approaches in teaching shall be the ultimate route of efficient and effective teachers to achieve meaningful learning.

There are changes in the world that undeniably affect the conventional ways of teaching. Bilbao et al. (2006) re-emphasize the significance of the 2001 UNESCO conference reports that had emphasized the multifarious changes in the global scene in education. The “UNESCO Commission on Education for the Twenty-first Century” proposed that the “learning process” should be based on the “Four Pillars of Education- Learning to Know; Learning to Do; Learning to Live Together; and Learning to Be”.

In order to achieve these “Four Pillars of Education”, innovative strategies shall be employed. Oxford (1990) observes that language learning strategies in recent years have been shifted in focus from the teacher to the learner. The shift of focus suggests that the success of language learning rests on the learners’ ability to fully utilize every opportunity to learn and employ the English language. Cooperative learning is one of the alternatives that teachers can use to ensure maximum participation of students in their classes. In this method, every learner is expected to be involved actively in his group because he is motivated by the “force of cooperation”.

Cooperative Learning and Lecture-Discussion Method

Cooperative learning refers to a method of instruction whereby students work together in groups to reach common goals. Within cooperative learning, students benefit from sharing ideas rather than working alone. Students help one another so that all can reach some measure of success. This is in contrast with the lecture-discussion method where students work individually or competitively. In the traditional method, students are generally concerned with improving their own grade, and goals are individualistic rather than group-wide.
The different proponents of cooperative learning define vividly the description and discuss clearly the structure of the different cooperative strategies. Ferrer (2008) explains that cooperative learning is an instructional strategy that capitalizes on the energy and coordination of students working in groups. It is clear that everyone shall be involved to maximize the design of this strategy. Johnson and Johnson (1994) expound that cooperative learning means instructionally using small groups so that students can work together to maximize their own and each other’s learning. Slavin (2006) illuminates that cooperative learning involves students working together as equals to accomplish something of importance to all of them.

Interaction and collaboration are always emphasized and developed when cooperative learning is used in the teaching-learning process. Kagan (1990) claims that cooperative learning structures are content-free ways of organizing social interaction in the classroom. He also stresses that in cooperative learning, group work is carefully designed to promote group interdependence and individual responsibility. It provides a chance for skill learning while at the same time teaching responsibility. Corpuz and Salandanan (2007) illustrate that cooperative learning approach makes use of a classroom organization where students work in groups or teams to help each other to learn.

The psychological, physiological, and sociological aspects of a learner affect his academic performance. Slavin (1995) gives and explains three reasons why cooperative learning works. Cooperative learning has “motivational effect”. Learning is seen as an obligation and a valued activity because the group success is based on it and one’s groupmates will reward it. Cooperative learning has “cognitive developmental effect”. According to Vygotsky (1978), collaboration promotes cognitive growth because students model for each other more advanced ways of thinking than any would demonstrate individually. According to Jean Piaget (1950), collaboration among peers hastens the decline of egocentrism and allows the development of more advanced ways of understanding and dealing with the world. Cooperative learning has “cognitive elaboration effect”. New information that is elaborated is more easily retrieved from memory than information that is not elaborated. A particularly effective means of elaboration is explaining something to someone else. He stresses also that communication is always involved in cooperative learning.

**Linguistic Competence and Cooperative Learning**

Linguistic competence was defined in 1965 by Noam Chomsky as the system of linguistic knowledge possessed by native speakers of a language. It is, according to Chomsky, this system of knowledge that makes it possible for speakers to produce and understand an infinite number of sentences in their language, and to distinguish grammatical sentences from ungrammatical sentences.

Bachman and Palmer (1996) note that effective language use requires both “organizational knowledge” (what is said) and “pragmatic knowledge” (how it is said). Not only must a speaker demonstrate lexical and structural language knowledge, but also effectively implement that knowledge in real time conversations. The implication would seem to be that, in the development of descriptive rating scales, static descriptions of language, lexical or structural, be tempered by recognition of the linear demands of conversation. One cannot expect demonstration of lexis or structure outside the topic boundaries of the conversation. Similarly, students should be given limited credit for the demonstration of language knowledge that does not contribute effectively to the unfolding discourse.

Language is best acquired when it is used in a way that is meaningful to the student. Cooperative learning provides opportunities for students to express themselves in a functional manner which is personally relevant to them. Students are using the language for a specific purpose, usually to meet certain group goals. The cooperative learning setting also provides for frequent use of the language. The fact that students are in small group settings allows for much greater opportunities for language use than the traditional classroom.

**Research Problem**

Despite the adequate classroom exposures of students in the English language, many of them could still hardly master and use the language. One reason of the non-mastery of the target language is the lack of authentic exposure of students where they could use the language. Students are also hesitant to communicate to their classmate in English because they are not given the opportunity to do so. In the traditional method of teaching a second or foreign language, students are required to simply listen and take down notes. When students could not understand the lesson, they are not motivated or encouraged to ask questions because they might be embarrassed, and most of them become passive in the classroom. High achievers are sometimes hesitant to help the slow achievers since the former are not required, obliged, or motivated to help the latter.
It is in this context that this study would like to unravel other cooperative learning alternatives that would surely involve students and make them more participative. The researcher wants to learn and share the processes involved in executing meaningful and productive cooperative learning, and to determine its effects to the teaching-learning process, and achievements of students.

Objectives of the Study

This study aimed to identify the effectiveness of cooperative learning strategies in developing the linguistic competence of students. Specifically, it sought to answer the following questions:

1. How effective is cooperative learning strategy in developing linguistic competence as compared to the traditional lecture-discussion method?
2. What is the attitude of the students towards the two teaching methods employed?
3. Is there a relationship between language competence and attitude towards cooperative learning/lecture-discussion method?

Research Methodology

Research Design

This study used the pseudo-experimental method using the repeated measures design. It is repeated because each section was exposed alternately to both strategies - the cooperative learning and lecture-discussion. A pretest was administered to the samples before the discussion of every lesson. The same test was used in the posttest which was administered at the end of every lesson.

Sampling Procedure

The 105 subjects of this study were taken from the two sections of first year BEED students who were enrolled in English 12- Grammar and Composition 2. There were 53 students in BEED- B and 52 students in BEED- A. The grouping was based on their previous grade in English. There were ten groups in each class, each composed of high, average and low achievers.

Research Instruments

There were two instruments administered to the samples. The “Achievement Test” for linguistic competence of the samples in the chosen topics. The “Attitudinal Inventory Scale Test” was used to determine the attitude of students towards the two methods employed.

Collection of Data

- **Pre-treatment Phase**
  Before the introduction of new lesson, a pretest was conducted to the samples.

- **Treatment Phase**
  The different cooperative learning strategies and lecture-discussion method were employed in all the specified topics for the duration of the study. The cooperative learning strategies used were Student Teams Achievement Divisions (STAD), Teams- Games- Tournament, and Jigsaw. The researcher used the same references, quizzes, materials, and seatwork for both classes.

<table>
<thead>
<tr>
<th>Schedule of the two Approaches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week and Topic</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>1. Sentence Fragment</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>2. Run-on Sentence</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>3. Misplaced Modifier</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
### Post Treatment

The achievement tests were checked, evaluated, and compared based on the research questions. The attitude inventory scale was administered, checked, evaluated, and compared based on the research question.

**Analysis of Data**

Correlation T-Test was used to compare the mean scores on the pretest/posttest of achievement tests and attitudinal inventory tests, and Pearson Moment Correlation was used to determine the correlation between the mean scores on achievement tests and attitude towards the methods employed.

**Results /Discussions**

**How effective is cooperative learning strategy in developing linguistic competence as compared to the traditional lecture-discussion method?**

The mean gain scores of the different lessons under cooperative learning are higher than the mean gain scores under lecture-discussion method. Though the mean gain scores are higher under cooperative learning, the computed t-value proves that there is no significant difference between the mean gain scores of the lecture-discussion method and cooperative learning along the six lessons. This shows that cooperative learning and lecture method are both statistically considered effective methods in developing linguistic competence.

**What is the attitude of the students towards the two teaching methods employed?**

Based on the computed t-value, it can be inferred that cooperative learning has influenced greater positive attitude change on the learner as compared to lecture-discussion method.

**Is there a significant relationship between attitude towards cooperative learning/lecture-discussion and the linguistic competence of the students?**

The attitude of students towards cooperative learning or lecture discussion method has no significant relationship with linguistic competence. The correlation coefficient results for linguistic competence and attitude towards cooperative learning indicate that both are not significant.

**Contributions of the study**

- Curriculum planners and administrators may use this study as a basis for curriculum revision emphasizing the development of linguistic competence using cooperative learning strategies.

- Teachers may employ the different cooperative learning strategies to improve the teaching-learning process and the linguistic competence of their students.

- Other researchers may also use this study as a reference in order to come up with other related studies.

**Conclusions**

Cooperative learning as an instructional method is an effective alternative to the conventional method of developing linguistic competence. When teachers are properly guided in using this method, learners will surely develop higher linguistic competence.
Figures/Display Elements

Table 1. Performance of the students taught under the lecture-discussion method in the pretest and posttest

<table>
<thead>
<tr>
<th>Topics</th>
<th>Mean (n=52)</th>
<th>Standard Deviation (n=52)</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>sentence fragments</td>
<td>Mean 3.08</td>
<td>Standard Deviation 1.10</td>
<td>5.17</td>
<td>1.95</td>
</tr>
<tr>
<td>run-on sentences</td>
<td>Mean 3.51</td>
<td>Standard Deviation 1.39</td>
<td>5.83</td>
<td>1.82</td>
</tr>
<tr>
<td>misplaced modifiers</td>
<td>Mean 3.46</td>
<td>Standard Deviation 1.42</td>
<td>5.31</td>
<td>1.97</td>
</tr>
<tr>
<td>dangling modifiers</td>
<td>Mean 3.55</td>
<td>Standard Deviation 1.78</td>
<td>5.30</td>
<td>2.12</td>
</tr>
<tr>
<td>faulty parallelism</td>
<td>Mean 3.04</td>
<td>Standard Deviation 1.47</td>
<td>5.27</td>
<td>1.93</td>
</tr>
<tr>
<td>subject-verb agreement</td>
<td>Mean 2.89</td>
<td>Standard Deviation 1.37</td>
<td>4.85</td>
<td>2.18</td>
</tr>
</tbody>
</table>

Table 2. Performance of the students taught under the cooperative learning in the pretest and posttest

<table>
<thead>
<tr>
<th>Topics</th>
<th>Mean (n=52)</th>
<th>Standard Deviation (n=52)</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>sentence fragments</td>
<td>Mean 3.11</td>
<td>Standard Deviation 1.29</td>
<td>6.85</td>
<td>1.80</td>
</tr>
<tr>
<td>run-on sentences</td>
<td>Mean 3.06</td>
<td>Standard Deviation 1.13</td>
<td>6.85</td>
<td>1.80</td>
</tr>
<tr>
<td>misplaced modifiers</td>
<td>Mean 3.58</td>
<td>Standard Deviation 1.32</td>
<td>7.19</td>
<td>1.83</td>
</tr>
<tr>
<td>dangling modifiers</td>
<td>Mean 3.40</td>
<td>Standard Deviation 1.58</td>
<td>7.58</td>
<td>1.53</td>
</tr>
<tr>
<td>faulty parallelism</td>
<td>Mean 3.08</td>
<td>Standard Deviation 1.30</td>
<td>6.92</td>
<td>1.79</td>
</tr>
<tr>
<td>subject-verb agreement</td>
<td>Mean 2.62</td>
<td>Standard Deviation 0.84</td>
<td>7.21</td>
<td>1.82</td>
</tr>
</tbody>
</table>

Table 3. Comparison between the pretest and posttest scores of the students taught with lecture-discussion method

<table>
<thead>
<tr>
<th>Subject Matter</th>
<th>PRETEST</th>
<th>POSTTEST</th>
<th>Comp. t-value</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sentence Fragments</td>
<td>M 3.08</td>
<td>SD 1.10</td>
<td>M 5.17</td>
<td>1.95</td>
</tr>
<tr>
<td>Run-on Sentences</td>
<td>M 3.51</td>
<td>SD 1.39</td>
<td>M 5.83</td>
<td>1.82</td>
</tr>
<tr>
<td>Misplaced Modifiers</td>
<td>M 3.46</td>
<td>SD 1.42</td>
<td>M 5.31</td>
<td>1.97</td>
</tr>
<tr>
<td>Dangling Modifiers</td>
<td>M 3.55</td>
<td>SD 1.78</td>
<td>M 5.30</td>
<td>2.12</td>
</tr>
<tr>
<td>Faulty Parallelism</td>
<td>M 3.04</td>
<td>SD 1.47</td>
<td>M 5.27</td>
<td>1.93</td>
</tr>
<tr>
<td>SV Agreement</td>
<td>M 2.89</td>
<td>SD 1.37</td>
<td>M 4.85</td>
<td>2.18</td>
</tr>
</tbody>
</table>

**= significant at .01

Table 4. Comparison between the pre-test and post-test scores of the students taught under cooperative learning

<table>
<thead>
<tr>
<th>Subject Matter</th>
<th>PRETEST</th>
<th>POST-TEST</th>
<th>Comp. t-value</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sentence Fragments</td>
<td>M 3.11</td>
<td>SD 1.29</td>
<td>M 6.85</td>
<td>1.80</td>
</tr>
<tr>
<td>Run-on Sentences</td>
<td>M 3.05</td>
<td>SD 1.39</td>
<td>M 7.29</td>
<td>1.82</td>
</tr>
<tr>
<td>Misplaced Modifiers</td>
<td>M 3.58</td>
<td>SD 1.32</td>
<td>M 7.19</td>
<td>1.83</td>
</tr>
<tr>
<td>Dangling Modifiers</td>
<td>M 3.40</td>
<td>SD 1.58</td>
<td>M 7.58</td>
<td>1.58</td>
</tr>
<tr>
<td>Faulty Parallelism</td>
<td>M 3.08</td>
<td>SD 1.30</td>
<td>M 6.92</td>
<td>1.80</td>
</tr>
</tbody>
</table>
Table 5. Comparison of the mean gain scores of the lecture-discussion and cooperative learning along the six lessons

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Mean Gain Score</th>
<th>Computed t-value</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LDM</td>
<td>CL</td>
<td></td>
</tr>
<tr>
<td>Sentence Fragments</td>
<td>2.10</td>
<td>3.74</td>
<td>4.73** 0.000</td>
</tr>
<tr>
<td>Run-on Sentences</td>
<td>2.32</td>
<td>4.23</td>
<td>5.84** 0.000</td>
</tr>
<tr>
<td>Misplaced Modifiers</td>
<td>1.85</td>
<td>3.60</td>
<td>5.26** 0.000</td>
</tr>
<tr>
<td>Dangling Modifiers</td>
<td>1.75</td>
<td>4.17</td>
<td>6.39** 0.000</td>
</tr>
<tr>
<td>Faulty Parallelism</td>
<td>2.23</td>
<td>3.85</td>
<td>4.34** 0.000</td>
</tr>
<tr>
<td>Subject-Verb Agreement</td>
<td>1.96</td>
<td>4.60</td>
<td>6.74** 0.000</td>
</tr>
</tbody>
</table>

**= significant at .01 level

Table 6. Comparison of the attitude of the students towards the use of cooperative learning and lecture-discussion

<table>
<thead>
<tr>
<th>Group/Time</th>
<th>Mean (CL)</th>
<th>SD</th>
<th>Standard Error of Difference</th>
<th>Computed t-value</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>CL Pretest</td>
<td>42.29</td>
<td>4.04</td>
<td>0.468</td>
<td>2.681**</td>
<td>0.000</td>
</tr>
<tr>
<td>Posttest</td>
<td>45.41</td>
<td>3.38</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LDM Pretest</td>
<td>41.64</td>
<td>2.94</td>
<td>0.438</td>
<td>3.455**</td>
<td>0.001</td>
</tr>
<tr>
<td>Posttest</td>
<td>43.15</td>
<td>3.42</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**= significant at .01 level

Table 7. Comparison between the mean gain attitude score of students in both cooperative learning and lecture-discussion

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean Gain Attitude Score</th>
<th>SD</th>
<th>Standard Error of Difference</th>
<th>Computed t-value</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>CL</td>
<td>3.12</td>
<td>4.791</td>
<td>0.645</td>
<td>2.497**</td>
<td>0.014</td>
</tr>
<tr>
<td>LD</td>
<td>1.51</td>
<td>4.492</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*= significant at .05 level

Table 8. Relationship between attitude toward cooperative learning/lecture-discussion and the linguistic competence of the students

<table>
<thead>
<tr>
<th>Variable</th>
<th>Correlation Coefficient</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linguistic Competence and Attitude Towards</td>
<td>0.092ns</td>
<td>0.352</td>
</tr>
<tr>
<td>Cooperative Learning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Linguistic Competence and Attitude Towards</td>
<td>0.157ns</td>
<td>0.109</td>
</tr>
<tr>
<td>Lecture-Discussion</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

References


The Effects of Cooperative Learning on Sciences-Related Subjects

Ng Kent Hoo*1, Angelina Anne Balasundram*2, Chua Ching Hao *3 and Meera Rada Krishnan*4

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Abstract

This study investigated the effectiveness of the cooperative learning on science-related subjects in Pre-University’s students. The students’ behaviors and performances in Mathematics and Chemistry were observed and evaluated in a period of 8 months. Initially, without grouping and giving specific instructions, the performances of two classes of students were observed. Then, the students were divided into groups based on the first evaluation’s results. The overall performances of the students for each class were evaluated after second evaluation. It was noticed that the students changed their learning behaviors from working alone to interacting among their peers throughout the length of the experiment. The results showed that the majority of the students achieved better results in the second evaluation after the cooperative learning model had been applied. These findings show that cooperative learning is an effective model for science-related subjects.

Keywords: Behaviors, Cooperative learning model, Science-related subjects.

Introduction

Cooperative learning has been proven to be an effective learning method in different stages of education. A plethora of studies over the last 40 years have documented the advantages of cooperative learning from kindergarten through to college level. These advantages have included the academic, social and emotional domains and covered the developments of more positive and supportive relationships and greater psychological health and well-beings for students who participated in cooperative learning than those who experienced the more conventional, competitive and individual approaches to instruction. The cooperative learning is not only applicable to art-related subjects but also science-related subjects. Maria V. (2016) conducted an experiment of the effectiveness of the cooperative learning in choral conducting education. The results showed that the students can collaborate in a group, not only as the role of a student, but also as a guider if the other members faced any difficulties. In such experiments, the teachers or instructors would just have acted as an observer. On the other hand, Roby M. G. (2008) conducted a research to investigate the effects of structured and unstructured cooperating groups during a science-related learning activity among the junior high school students. The results showed that the students in structured cooperating groups demonstrated more cooperative and helping behaviors such as giving elaborated help and guided directions to assist their understandings than their peers in the unstructured groups. This research demonstrated the outcome of the effective cooperative learning must at least include a basic guidance before passing the responsibility of learning to the students. The cooperative learning certainly has plenty of positive effects in education, it may help students elaborate upon problem information through interpersonal discourses, and this may provoke a higher level of thinking. Interactions stimulate students to put forward and order their thoughts, and to understand the ideas or questions from their peer students.

Research Problem

Cooperative learning may help students elaborate upon problem information through interpersonal discourses, hence, stimulate a higher level of thinking. The interactions among the peer students gather the ideas or thoughts
while solving a question or task. Therefore, the attitudes and behaviors of each member in a group may affect the emotions of other members, hence, affect the performance of a group. Besides, the basic knowledge of a student also plays another important criterion in the cooperative learning. The students from different background and different intelligence may affect the impacts of cooperative learning. Therefore, the first research question of this study is to discuss the effectiveness of the cooperative learning of a group of students with different basic knowledge and intelligence.

The cooperative learning has been proven to be able to leave positive impacts in social-related education such as social sciences, musical education and psychological related subjects. However, there is only a few applications of this model in science-related subjects. The main factor that affects the utilization of the cooperative learning in science-related subjects is due to the contexts of the science subjects are primarily based on the theoretical and logical thinking. The interaction with the other students is a less important criterion in these contexts. Nevertheless, as the level of education escalated from primary to secondary and tertiary, the students may involve in problem-based learning projects which may require working in groups. The lack of team working skills may lead to team dysfunction, and eventually lead to failure to achieve the goals. Thus, the second research question of this study is to examine the effectiveness of cooperative learning in science related subjects.

Objectives of the Study

In order to investigate the research questions raised in the previous section, an experiment was carried out. We aimed to investigate the effectiveness of cooperative learning among the students with different level of basic knowledge, also to study the effectiveness of cooperative learning in science-related subjects.

Research Methodology

Subjects

This study focused solely in the effectiveness of cooperative learning in science-related subjects among Pre-University students. The subjects were chosen randomly from Pre-University’s students in Sunway College Johor Bahru. These students came from diverse backgrounds. Some had studied in national secondary schools while others were from private secondary schools. Two classes of students from A-Levels programme, named Class A and Class B in this paper, were chosen to undergo certain assessments and observations of their learning behaviors were recorded. The subjects chosen for this study were Chemistry and Mathematics. Two key assessments, which included Semester Examination and Trial Examination were used to evaluate the effectiveness of the cooperative learning. The subjects were under observations for a duration of 8 months. In this study, the teachers only act as an observer, which the roles are to observe the discussion.

Designs and Methodologies

The subjects from each group were under observations since the beginning of the study. In each group, students’ results of the subjects Mathematics and Chemistry were used as a tool to evaluate their performances. The results of Mathematics were used as the indicators to evaluate the students’ performances in Class A. The results of Chemistry were used as the indicators to evaluate the students’ performances in Class B.

Initially, the students were taught in conventional ways, where lecturers lectured in front of the class while students listened and discussed the lectures with their peers at their own paces. They were assigned to work for certain activities and exercises. The behaviors of the students and the ways of completing the tasks were observed. The first evaluation was carried out four months later than the semester had begun. We evaluated the students’ performances using their results in the Semester Examination. Based on these results, the students from each class were divided into five minor groups, with six students in a group. In each group, there were at least two students with better results in their Semester Examination. These students were expected to act as the mentor or leader in the groups. The second observation was carried in the second semester. The subjects were requested to work in groups for activities and exercises. In this stage, some new elements such as group projects and presentations were introduced. These elements encouraged the interactions and discussions among the students in the groups. The performances and achievements were recorded. The second observation was Trial Examination of AS level. The results of the subjects were recorded. The students’ performances differences in these two examinations were studied to evaluate the effectiveness cooperative learning.
Results and Discussions

In the first stage of the observations, the students tended to work individually when they were requested to complete certain activities or tasks. The students tended to work on their own. However, there were a small numbers of students worked in groups to complete the tasks. This showed some students had already incorporated cooperative learning model even they were not requested to. The lecturers in these classes observed the students’ learning behaviors and investigated the reasons of these behaviors. Two main students’ learning behaviors were observed in the class, which were interactive type and non-interactive type. The summaries of the observations are shown in the following tables.

Table 1. The students’ learning behaviors of the students in the beginning of the study.

<table>
<thead>
<tr>
<th>Types</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interactive</td>
<td>• The students were attempting to solve the tasks alone at the beginning.</td>
</tr>
<tr>
<td></td>
<td>• The students would rather seek assistances from their peers than the lecturers if they had not been to solve the tasks.</td>
</tr>
<tr>
<td></td>
<td>• The students tended to seek the assistances from the peers that they feel comfortable with.</td>
</tr>
<tr>
<td>Non-interactive</td>
<td>• The students carried out the given tasks alone.</td>
</tr>
<tr>
<td></td>
<td>• They would seek the assistances from the lecturers if they had faced any problems.</td>
</tr>
<tr>
<td></td>
<td>• Some students would not attempt the tasks but rather wait until the lecturers discussed the tasks.</td>
</tr>
</tbody>
</table>

These observations showed that the students with interactive type of learning behavior performed better than those students with non-interactive type of learning behaviors in the lectures. They were able to understand and solved the tasks. On the other hands, the students with non-interactive type of learning behavior were unable to achieve the goals of the tasks and were often lack of self confidence in class. From this phenomenon, a hypothesis can be made; the cooperative learning will be beneficial to the students, even they might come from a diverse background. This can be further proven by the Semester Examination’s results. The interactive-type students achieved better results compared to the non-interactive-type students. The second stage of observations begun after the students were grouped based on their learning behaviors and results. The lecturers had assigned the members in each group to make sure at least two of them were interactive-type of students. The interactive students played the roles of “catalysts” for discussions. The observations in this period can be identified as 3 stages in chronological order, which would be low-interactive, mild-interactive and high-interactive. The observations were summarized in the table below.

Table 2. The three stages of students’ interaction after introducing cooperative learning.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-interactive</td>
<td>• interactive-type students would give opinions and initiate the discussion.</td>
</tr>
<tr>
<td></td>
<td>• The non-interactive-type students only follow the instructions and provide least opinions.</td>
</tr>
<tr>
<td>Mild-interactive</td>
<td>• The non-interactive-type students begun to voice out their thoughts in the discussion.</td>
</tr>
<tr>
<td></td>
<td>• The majorities of the discussion were led by the interactive-type students.</td>
</tr>
<tr>
<td>High-interactive</td>
<td>• The discussions were not only led by the interactive-type students but sometimes non-interactive-type students.</td>
</tr>
<tr>
<td></td>
<td>• The non-interactive-type students were able to identify the cores of the tasks and initiate the discussion.</td>
</tr>
</tbody>
</table>

The significant changes of the learning attitudes of the non-interactive-type showed a positive result in cooperative learning. At the beginning of this second observation, the interactive-type students showed a negative learning behavior. This was due to their uncomfortable feeling of worrying about the performances in the group might be affected by the non-interactive-type students. However, the interactive-type students
changed their mindsets after they had realized that they would learn extra knowledge and skills through guiding the others and leading the discussions. The non-interactive-type students were benefited by this cooperative learning model as they had changed from introverted characteristics to more extroverted personalities.

Comparing the results of Semester Examination and Trial Examination, the mean of the examination scores of the students in Class A was increased by 18.17%. However, the increments had a standard deviation of 9.74%. This represented that the increments were not consistent. The basis behind the large standard deviation were as following. 1) Some of the students had already performed well in the first evaluation, their range for improvement were limited. 2) Some students possessed low interests in the studies. These assumptions have to be proven in the future study which considers the students’ interests into account. On the other hand, the mean of the examination scores of the students in Class B was increased by 4.33%. The mean of Class B was lower than the mean of Class A because there were some negative increments in the Class B’s results. In general, the overall results of both classes showed positive increments. An additional hypothesis could be made from the results shown above, that is, regardless of the students’ interests in the subjects, the increments of the examination scores for different science subjects may be different.

Contributions of the study

In this study, the results showed positive outcomes which proved the effectiveness of the cooperative learning model in science-related subjects. Hence, it is recommended to introduce the incorporation of cooperative learning model in science-related subjects. Another contribution of this study is the raise of considering the students’ interests in the subjects before devising a cooperative learning model. In future, the students’ interests in the subjects have to be a parameter of the study.

Conclusions

This study significantly proved the effectiveness of the cooperative learning in science-related subjects. At the beginning of the observation, the students showed less interaction with others and mostly worked individually whenever a task being assigned. After the instruction of working in a group basis was given, the students started to discuss and provided opinions within their groups. Inter-groups interactions were also noticed occurred when they faced the difficult problems. The attitude change of some weaker students is another positive outcome that can be observed in this study. However, the existences of some outliers such as the drop in examination scores for some students raised the interests of future studies which include the study of students’ interests in the subjects and the effectiveness of this model in different subjects. In conclusion, cooperative learning model is an effective model which can be introduced to improve the performances of the students. Besides, the factors like the type of subjects and its effectiveness, the gender of the learners and the type of assessments should be considered before conducting the study.

References

Appendix

**Figure 1.** Comparison of the results of Mathematics for Class A before and after application of cooperative learning teaching model.

**Figure 2.** Comparison of the results of Chemistry for Class B before and after application of cooperative learning teaching model.
Young Novice Entrepreneurs’ Techniques Of Generating Business Ideas and Evaluating Entrepreneurial Opportunities for New Business Ventures

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Abstract

This qualitative study of youth entrepreneurship explores the techniques used by young novice entrepreneurs in generating business ideas and evaluating entrepreneurial opportunities which are of different dimensions when setting up new business ventures. The young novice entrepreneurs used different techniques (with the exception of the social media/Internet research) in generating business ideas (endogenous situations) and evaluating entrepreneurial opportunities (exogenous situations) respectively, reflecting the two different dimensions. It is therefore imperative that the young novice entrepreneurs be taught the different techniques in entrepreneurial education, workshops or boot camps.

Keywords: Business ideas; Entrepreneurial opportunity; Entrepreneurship; Young novice entrepreneurs

Introduction

As societies are increasingly concerned with the problems of youth unemployment and uncertain corporate careers, the need to encourage youths to become young entrepreneurs is the call of today’s governments. In entrepreneurship, entrepreneurs need to generate business or entrepreneurial idea\(^1\) and evaluate entrepreneurial opportunities which are of different dimensions in the new business ventures.

Research Problem

There is a limited research examining on how young novice entrepreneurs generate business ideas and evaluate entrepreneurial opportunities for their new business ventures. The process of entrepreneurial opportunities begins with an idea. Ontologically, researchers such as Dimov (2007) and Roya Molaei, Mohammad Reza Zali, Mohammad Hasan Mobaraki and Jahngir Yadollahi Farsi (2014) viewed business ideas and entrepreneurial opportunities as two different but intertwined constructs. A business idea (endogenous situations) is needed to trigger an entrepreneurial opportunity (exogenous situations) for the manifestation of new business ventures. Business ideas are defined as ‘all the existing operational and strategic business ideas of an individual in a specific period of time’ (Roya Molaei et al., 2014, p. 141). Whilst Shane (2003, p.18) defined an entrepreneurial opportunity as “a situation in which a person can create a new means-ends framework for recombining resources that the entrepreneur believes will yield a profit”. However, many people mistook their aspirations (business ideas) for an entrepreneurial opportunity when there was no real opportunity in the first place, resulting in closing down their businesses (Hunter, 2013). It is this confusion that led Dimov (2007, p. 718) to argue that “…not every idea is a good opportunity…” and concurred that they are two distinct considerations; hence ideas are necessary but not sufficient condition for entrepreneurial opportunities to emerge. Since business ideas and entrepreneurial opportunities are two different but intertwined constructs, entrepreneurs therefore may need different techniques to generate business ideas and evaluate entrepreneurial opportunities respectively.

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\(^1\) Business ideas or entrepreneurial ideas are used interchangeably in this study.
Objectives of the Study

This study intends to explore how young novice entrepreneurs generate business ideas and evaluate entrepreneurial opportunities for their new business ventures respectively, based on two research questions:

RQ1. How did your group generate the business idea for the new business ventures?
RQ2. How did your group evaluate the viability of this business idea in terms of entrepreneurial opportunities?

Research Methodology

In entrepreneurial studies, youth is defined as young people between the ages of 18-34 years (Kew, Herrington, Litovsky and Gale, 2013); novice entrepreneurs refer to individuals with no prior private business ownership experience as founders, purchasers or inheritors of a business (Ucbasaran, Westhead, Wright, and Flores, 2010). In this study, the operational terms of the young novice entrepreneurs therefore refer to the full-time second year undergraduate business students, both males and females, with an average age of 20 years old with no entrepreneurial experiences, presently taking an entrepreneur course in a premier higher education institution, as the unit of analysis. The study was conducted at the end of a semester of 14 weeks as the participants needed the full period of the semester to generate business ideas and evaluate the viability of business idea in terms of entrepreneurial opportunities.

Following Creswell (2014)’s qualitative inquiry approach, this study is using purposeful sampling to intentionally select groups of participants (since their entrepreneur coursework is based on groups); and sampling strategy of homogeneous whereby the groups of participants were selected based on similar traits such as the full-time second year undergraduate business students, with an average age of 20 years old with no entrepreneurial experiences, presently taking an entrepreneur course in the premier higher education institution. As the typical of a qualitative study, the sample size of the study was limited to 25 participatory groups (out of 75 participatory groups) in the entrepreneurship course; because “the overall ability of a researcher to provide an in-depth picture diminishes with the addition of each new individual” (Creswell, 2014, p.231). Each participatory group comprised 4-5 students.

In this study, two unstructured, open-ended questions (RQ1 and RQ2) were emailed to the group representatives of the 25 participatory groups and data were collected at the end of semester. With the readily available of the email addresses of the participants, email interviews provide rapid access to large numbers of people and a detailed, rich text database for qualitative analysis (Creswell, 2014). As a document is primarily comprised of text normally stored as a Word document, it is therefore possible to use contemporary documents such as emails, blogs, web pages, etc. in recording what someone said or what happened to gather data (Myers, 2013). According to Coffey (2013), many social settings are self-documenting and there is considerable methodological potential to study the documentary realities of social worlds, as shown in the works of researchers such as Foo (2010).

Results /Discussions

In RQ1, the emerging themes reflected five techniques that were used by the young novice entrepreneurs in generating business ideas.

A. Brainstorming session

Brainstorming session (Osborn, 1953) emerged as the leading and most efficient technique (52%). For example, Participant 2 put it that: “Our group uses group discussion to generate business idea, we think that this is the most efficient since we can conduct brainstorming session. Since we work as a team, doing research alone won’t have the best effects, everyone has his own limitations. But with brainstorming, we can have more ideas and arguments to generate a better idea. It’s a concept of synergy. While having such session, one simply has to take up the devil advocate’s role to avoid the whole team going to the wrong direction.”

The participants also chose the brainstorming session due to its ability in generating a large number of ideas. This was reflected in Participant 7’s comments as follows: “We choose brainstorming method because we can generate a large number of ideas quickly. Because leap-frogging is encouraged, we can use one idea as a

2 Adults refer to people between the ages of 35 – 64 years (Kew et at., 2013).
means of jumping forward quickly.” The participants’ comments showed that the number of ideas (ideas volume) is certainly important when choosing the techniques of generating business ideas, which were well supported by Roya Molaei et al., (2014)’s works. In sum, the participants chose the brainstorming session as the leading technique in generating business ideas for their new business ventures due to its efficiency and effectiveness, and ability in generating ideas volume.

B. Multiple techniques

Another noticeable trend emerged was the other four multiple techniques used by the young novice entrepreneurs to generate business ideas. A number of the participatory groups used more than one technique, besides the brainstorming session, such as family and friends’ suggestions (18%), market trending (15%), social media/Internet research (12%) and library research (3%). For example, Participant 6, used multiple techniques such as: “We had generated our business idea via several processes such as brainstorming, group discussion, and even through virtual meeting via Facebook and WhatsApp. Besides we had also done our research on similar industry through internet and library in order to gain a deeper insight of related industry.”

The young novice entrepreneurs used the multiple techniques to show their concerns of the effectiveness of their findings. They may realise the limitations of just using one technique such as brainstorming session in generating business ideas. For example, Participant 8 summarized the wisdom of using the multiple techniques to be: “First, we have a brainstorming session … Second, we did online research … to check the feasibility of all the ideas we have written down in brainstorming session and any new ideas that is suitable.” In sum, since the young novice entrepreneurs have no entrepreneurial experiences, they resorted to using the different techniques in generating business ideas to reaffirm the effectiveness of their business ideas.

In RQ2, the emerging themes reflected four techniques (some participatory groups used more than one techniques) that were used by the young novice entrepreneurs in evaluating entrepreneurial opportunities.

A Market survey (31%)

Market survey emerged as the leading technique, and was deemed important as Participant 7 put it that: “The most important homework to do is making sufficient market researches. Market research is the process of discovering the common characteristics and preferences of our target customers (what they need and what they can afford), who our competitor is (existing suppliers are enough in the industry?), and what current and future trends (economy) can affect our business. By doing so, we ensure that our business idea will be viable.” Since business ideas and entrepreneurial opportunities are two different constructs, it is imperative that the young novice entrepreneurs conduct market researches to evaluate their business ideas as the external environment is the source of new entrepreneurial opportunities whereby they can profit from them through their business ideas.

B Personal observation and judgement (28%)

For personal observation and judgement technique, the participants were utilising their knowledge, skills and abilities in evaluating the viability of the business ideas. Participant 20 discerned the situation with the following comments: “We observe the operation of some profitable company to understand how a sustainable business model works. We adopt those sustainable business models into our business operation.” The young novice entrepreneurs were therefore using their existing knowledge, skills and abilities, under the resource-based theories (RBV), to ascertain whether their business ideas were attractive and feasible to them (Haynie, Shepherd and McMullen, 2009). This type of evaluation is important as Hunter (2013) put it that many people mistook their aspirations (business ideas) for an entrepreneurial opportunity when there was no real opportunity in the first place, resulting in closing down their businesses.

C Social media/Internet research (22%)

For the young novice entrepreneurs, using Internet to carry out their social activities or work tasks was a daily matter, as for example, Participant 16 commented that: “Lastly, we have determined the feasibility of our business idea through the proposal postings on Facebook, where numerous feedbacks are collected and analysed in order to attain sufficient information for refining purposes.” The young novice entrepreneurs chose social media/Internet research as a technique could be due to its’ ability in collecting customers’ comments, feedbacks and ideas for their new business ventures.
D Experts’ opinions (19%) 

Lastly, the young novice entrepreneurs solicited experts’ opinions from friends, family members and lecturers as a technique of evaluation. For example, Participant 11 commented that: “We actually collect feedback and comments from our friends and lecturers upon this idea, and adopt relevant market analysis to test the viability of the business idea and eventually found it to be a very good idea.” This view is supported by researchers’ findings such as Foo (2010) in which assistance from individuals with business founding experience related positively to the teams’ business ideas evaluations; and Biais and Perotti (2008) in which successful business creation requires that unprofitable ventures be weeded out through experts’ screening.

Contributions of the Study 

Although brainstorming session emerged as the leading technique in the generation of business ideas, the young novice entrepreneurs also used multiple techniques to overcome the limitations of just using one technique (the brainstorming session), in ensuring the effectiveness of their findings. As for the entrepreneurial opportunities as exogenous situations, the young novice entrepreneurs therefore used different techniques such as market survey, personal observation and judgement, social media/Internet research, and soliciting experts’ opinions in evaluating the viability of their business ideas. In sum, the young novice entrepreneurs used the different techniques (with the exception of the social media/Internet research) to generate business ideas (endogenous situations) and evaluate entrepreneurial opportunities (exogenous situations) respectively. These different techniques should be highlighted and taught in entrepreneurial education for young novice entrepreneurs. Since this study is limited in targeting at the full-time undergraduate business students in an educational context, it could be replicated in more natural business environments such as entrepreneurial workshops or boot camps where the young novice entrepreneurs develop business ideas and evaluate entrepreneurial opportunities intended to be taken to market shortly.

Conclusions 

The literature review evidently showed that business ideas (endogenous situations) and entrepreneurial opportunities (exogenous situations) are two different but interwined constructs; this study further reaffirmed that entrepreneurs must therefore use different techniques (with the exception of the social media/Internet research) for these two dimensions of entrepreneurship respectively.

Acknowledgment 

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References 


The Reflective Thinking Questionnaire for Teachers: Development and Preliminary Validation

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Abstract

This article describes the development and validation of the 32-item Reflective Thinking for Teachers Questionnaire (RTTQ) designed to assess the process of reflective thinking among teachers. The process of instrument development and validation is described, along with a review of relevant literature related to the process of reflective thinking. An exploratory factor analysis and a subsequent confirmatory factor analysis of the responses of a large sample (N = 659) was carried out. The results of the study showed that the structural equation model developed fitted the questionnaire data well. The confirmatory factor analysis produced goodness of fit indices within an acceptable range and the questionnaire appeared to be a reliable instrument that would assist in the assessment and improvement of the quality of reflective thinking among teachers.

Keywords: reflective thinking, teacher education, instrument validation, instrument development, critical thinking

Introduction

Reflective thinking and the role it plays in stimulating critical thinking is currently at the forefront of many of recent research studies (Bell et al, 2011; Choy & Oo, 2012). One of the main reasons for the interest in this area is that the ability of individuals to reflect on their experiences is a fundamental skill necessary for learning and decision making (Bell et al, 2011).

According to Lee (2005) practitioners begin reflection when there is a problem that cannot be resolved or when they wish to reconsider an educational situation or a conclusion they have previously reached. These practitioners will engage in reflection in order to understand the nature of teaching, their personal values and beliefs. Hence the stages of reflective thinking need not indicate the progress toward a solution but rather the degree of awareness of the situation where the process and progress are viewed together. Cox (2005) further notes that reflection forms a bridge between a course of study and personal experience creating a highly individual and very motivating learning activity.

Research Problem

Developing students’ ability to do reflective thinking has been the essential goal for learning and transformation in higher education. Hence it is crucial for teachers to carry out reflective thinking themselves and eventually become a model demonstrating the process of such thinking.

While there are many ways of evaluating reflective thinking among teachers, from using reflective journals to document their experiences when teaching (Hubbs & Brand, 2010) to classroom observations and interviews (Lee, 2005), such methods although rigorous and thorough are time consuming and do not provide feedback to teachers until the data collected can be analysed. An instrument that can provide quick useful information that help teachers gain insight into how they teach will be useful. A further search of the existing literature did not
yield reports on the development of a self-reporting type questionnaire that is developed to assess reflective thinking in teachers except for one that was developed by Choy and Oo (2012) but the instrument was not validated.

**Objectives of the Study**

This article reports on the further development of the Reflective Thinking for Teachers Questionnaire (Choy & Oo, 2012) and its validation for use with teachers in higher education.

Using the rubrics by Sparks-Langer and Colton (1991), Hamilton (2005) (Table 1), Choy and Oo (2012) subsequently developed a questionnaire to assess the reflective thinking of teachers with an area added for belief about the self and self-efficacy.

<table>
<thead>
<tr>
<th>Areas of Development</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to self-assess</td>
<td>Demonstrates understanding</td>
</tr>
<tr>
<td>• Observing own performance</td>
<td>Uses feedback</td>
</tr>
<tr>
<td>• Using feedback</td>
<td>Narrates process (did this, did that)</td>
</tr>
<tr>
<td>• Finding and analysing patterns</td>
<td>Probes own work</td>
</tr>
<tr>
<td>• Making judgements</td>
<td></td>
</tr>
<tr>
<td>Awareness of own teaching skills</td>
<td>Uses feedback and past performance to plan future learning</td>
</tr>
<tr>
<td>• Concepts and misconceptions</td>
<td>Understands own learning and transfers it to multiple contexts.</td>
</tr>
<tr>
<td>• Knowledge construction</td>
<td></td>
</tr>
<tr>
<td>• Metacognition</td>
<td></td>
</tr>
<tr>
<td>Developing lifelong learning skills</td>
<td>Questions personal assumptions</td>
</tr>
<tr>
<td>• Developing identity as a learner</td>
<td>Sees own identity as a learner and uses internalised construction of effectiveness</td>
</tr>
<tr>
<td>• Transferring learning to other contexts</td>
<td>Questions assumptions and awareness of multiple perspective</td>
</tr>
<tr>
<td>• Understands learning as a lifelong process</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Development in Reflective Thinking. Adapted from Hamilton (2005)

The extra area was added because teachers are highly influenced by their beliefs (Williams & Burden, 1997) and self-efficacy is a better predictor of how teachers behave in the classroom when other factors influencing the behaviour are controlled (Pajares, 1995).

**Research Methodology**

The preliminary measure of the reflective thinking for teachers questionnaire consisted of 33 items from the Questionnaire for Reflective Thinking for Teachers designed by Choy and Oo (2012). The items were used with permission from the authors. No changes were made to the original items or the 5-point Likert Scale. A 5 on the scale indicates Strongly agree, 4 Agree, 3 Neutral, 2 Disagree and 1 Strongly disagree.

The questionnaire was given to five persons who were academic staff of a university but not taking part in the research. They were asked to highlight any linguistic ambiguities on the questionnaire and items that lacked clarity were modified. This new instrument was called the Reflective Thinking for Teachers Questionnaire (RTTQ).

The draft version of the RTTQ was field tested with a sample of 142 practicing teachers from a university that had branch campuses throughout Malaysia from which 139 valid responses were obtained. Of the total respondents, 90% were female and 10% were male. Among the sample, 42% of them had 1-5 years of teaching experience, 27% had 6-10 years, 19% had 11-15 years and 12% had more than 16 years. All the respondents completed the questionnaire in English and as a paper and pencil exercise.

The informed consent of all the respondents was obtained prior to administration of the questionnaire. They were also told that they could withdraw from the study at any time. The data was obtained from the respondents on a voluntary basis.
An exploratory factor analysis was conducted and this resulted in a shorter, revised version of the RTTQ. This was used in the second administration of the questionnaire which took place with another sample of 600 practicing teachers from several schools in Malaysia to determine the confirmatory factor analysis. The second sample obtained 520 responses consisting of 241 male and 279 female teachers. Among the sample 96.2% of them had up to five years teaching experience and 3.8% had six and more years of experience. All the respondents completed the questionnaire in English as a paper and pencil exercise. Their informed consent was obtained.

**Results /Discussions**

**Exploratory Factor Analysis**

An investigation of the RTTQ factor structure was conducted using SPSS (version 16) to determine whether there was empirical support for separate factors pertaining to reflective thinking among teachers and to identify any items that might be removed from the questionnaire. Before conducting the EFA, two indicators were tested for sample appropriateness for such an analysis. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy index was .88 and the Bartlett’s Test of Sphericity was significant χ² = 2251.13, p < .001, indicating the sample and correlation matrix were within an acceptable range for analysis.

The principal component analysis (PCA) was carried out on the 33 items of the first version of the RTTQ to estimate the maximum number of factors that would be of interest. An initial estimate of the number of factor was provided by using eigenvalues greater than one (Kaiser’s criterion) which indicated support for an eight factor solution. However, an eight factor solution would not be parsimonious, the scree test of eigenvalues plotted against factor was examined. This examination suggested only three to four factors should be retained. The results suggest four factors should be retained. Parallel analysis was used because it provides an accurate indicator of the number of factors to be retained and helped to distinguish important factors from trivial ones (Ledesma & Valero-Mora, 2007).

Principal-axis factor analysis (PFA) was chosen from among the methods of common extraction with Equamax rotation with Kaiser Normalisation, which minimised the number of variables that loaded highly on a factor and the number of factors needed to explain a variable resulting in a simple structure within variables. The 33 items then underwent two PFA runs specifying three and four factors.

The four-factor solution was then examined for the presence of unsatisfactory items. A factor loading of 0.4 was used as used as the cut off point for variable acceptance. Using an iterative process, the remaining 32 items underwent another PFA analysis again using As there was little change to the number of items, the KMO of the final analysis remained at 0.88.

All of the four factors were clearly identifiable along the areas of development in reflective thinking (Hamilton, 2005), show in Table 1, developing lifelong learning skills (Factor 1), ability to self-assess (Factor 2), awareness of own teaching skills (Factor 4) and belief about self and self-efficacy (Factor 3) an area added by Choy and Oo (2012). The total variance explained by the four factors was 52.6% with the Factor 1 accounting for 32.45, Factor 2 accounting for 10.3%, Factor 3 accounting for 5.5% and Factor 4 accounting for 4.4% correlations among the four factors. Internal consistencies (Cronbach’s alphas) were calculated for each of the multi-item RTTQ factors based on the responses of the participants. Internal reliability ranged from 0.81 for belief about self and self-efficacy to 0.92 for developing lifelong learning skills. The correlations between the factors as well as Cronbach’s alpha reliabilities between each scale.

**Confirmatory Factor Analysis**

A confirmatory analysis was conducted based on data collected from the second sample, using AMOS (Version 20). Based on the result of the EFA, a four factor model of lifelong learning, ability to self-assess, belief and self-efficacy, and awareness of own teaching skills was hypothesised. These factors were also hypothesised to covary with each other. An examination of the goodness-of-fit for the four factor model, (χ² = 960.24, df = 311, p < .001), the final exploratory analysis showed that there might be a statistical basis for rejecting the solution in favour of one with one less factor, hence the four factor baseline model was compared with a three and a five-factor model. In order to compare the goodness-of-fit for the two models, maximum likelihood estimation, a technique commonly used for confirmatory factor analysis (Pallant, 2011) was used as there were no universally accepted set of criterion to prove model fit (Kline, 2011). Hence several widely accepted goodness-of-fit
indexes were computed as shown in Table 2. Models with a GFI, CFI and TLI greater than .90 are considered acceptable however, the RMSEA value is expected to have an upper limit of .07 (Hooper at al, 2008).

<table>
<thead>
<tr>
<th>Model</th>
<th>df</th>
<th>( \chi^2 )</th>
<th>( \chi^2/df )</th>
<th>p</th>
<th>GFI</th>
<th>CFI</th>
<th>TLI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-Factor Correlated</td>
<td>402</td>
<td>1682.90</td>
<td>4.19</td>
<td>0</td>
<td>.84</td>
<td>.84</td>
<td>.81</td>
<td>.078</td>
</tr>
<tr>
<td>4-Factor Correlated</td>
<td>311</td>
<td>960.24</td>
<td>3.08</td>
<td>0</td>
<td>.93</td>
<td>.93</td>
<td>.93</td>
<td>.048</td>
</tr>
</tbody>
</table>

Table 2 Summary of the fit indices for the proposed models

The comparison between the two models showed that the four-factor model exhibited a better overall fit, RMSEA = .048, than the three-factor model. The other indices also indicated that the four-factor model was a better overall model of the two in comparison.

An examination of the standardised solution of the four-factor model indicated that correlations among the factor ranged from .01 to .48, with ability to self-assess and developing lifelong learning skills showing the strongest relationship, \( r = .48 \) and belief about self and self-efficacy and developing lifelong learning skills showing the weakest relationship, \( r = .01 \).

**Relationship Between the Factors and the Reflective Thinking Process**

The first factor (developing lifelong learning skills) represents a group of items that assesses the willingness of teachers to embrace lifelong learning of the skills required for their jobs. It determines if teachers are willing to learn from their mistakes and move on. The second factor (ability to self-assess) represents items that are oriented toward assessing the critical thinking and analysis that teachers carry out on their performance in the classroom. The third factor (belief about self and self-efficacy) represent beliefs about self and others that could influence teacher behaviour in the classroom. Finally the fourth factor (awareness of own teaching skills) represents items that probes into teaching skills and the awareness of how it is used. The seven items in this factor investigates the awareness and reactions toward classroom situations, students and peers.

**Contributions of the study**

The results obtained from the RTTQ responses can be useful for teachers, teacher educators and researchers. First, teachers especially novice teachers can use the RTTQ for self-assessment purposes to determine their current level of reflective thinking and to chart their development of this form of thinking over time. Second, teacher educators can use the RTTQ as a diagnostic or consciousness-raising tool in a similar manner in which teacher use the questionnaire for self-assessment purposes. Teacher educators can administer the questionnaire to a group of pre-service teachers and assess the degree of self-reflection that takes place during their teaching practicum or at a specific point during their teaching experience. reflective process. Finally researchers can use the RTTQ as a research tool to chart the development and progress of reflective thinking among pre- and in-service teachers.

**Conclusions**

This article has described the development and validation of a self-report questionnaire to assess reflective thinking among teachers. Although the RTTQ has demonstrated to have robust psychometric properties as a measure of reflective thinking in teachers, it still remains a self-report instrument. As with all self-report instruments, the RTTQ should be considered as one source of information about the current level of reflective thinking occurring among teachers.

**References**

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The Effects of Task Demand and External Stimuli on Learner's Stress Perception and Performance

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Abstract

Over the past decades, research in e-learning has begun to take emotions into account, which is also known as affective learning. It advocates an education system that is sentient of learner’s cognitive and affective states, as learners’ performance could be affected by emotional factors. This exploratory research examines the impacts of task demand and external stimuli on learner’s stress perception and job performance. Experiments are conducted on 160 undergraduate students from a higher learning institution. The results show that the impacts are significant. Correlations between task demand, external stimuli, learner’s stress, and job performance are also significant.

Keywords: clock, demand, performance, stress, time pressure, timer

Introduction

To evaluate students’ performance of a given assessment, it is very common that teachers would only track the scores that the students obtained, nevertheless this is not enough. Over the past decades, research in education has begun to take emotions into account, because of their influence in perception, reasoning, decision-making and learning (Landowska, 2013; O’Regan, 2003; Sharples et al, 2015). There is lack of empirical affective learning research that examines the effect of task demand and external factors such as time pressure, time pressure, clock display, and timer display, external stimuli can negatively affect his or her task outcome. According to Selye (1956), stress can be classified into eustress, understress, overstress, and distress, which can positively or negatively affect learning. Eustress is a kind of good stress that motivates a person to thrive for greater achievements. Understress creates a very negative effect that often results in boredom, fatigue and dissatisfaction. Overstress occurs when one pushes himself or herself beyond his/her limits, which leads to the state of fight or flight. Distress involves unresolved negative feelings of fear, anxiety and frustration, which build psychological barriers to further learning. Hajcak et al argued that the impact of negative emotion on performance decrement may be caused by the task demands itself, or other external factors that are related to the task (Hajcak, Dunning, & Foti, 2007). If the factor that generates negative emotion can be determined, teachers or e-learning developers can redesign the learning process, including adapting the instructions and improving the learning environment, to enhance student’s attitude in learning.

Research Problem

This research studies the effects of task demand and external psycho-physiological stimuli on learners’ stress perception and their task performance. To stimulate task demand pressure on learners, we introduce mental arithmetic problems, which are widely used to induce negative stress (Setz et al. 2010; Owen et al. 2005; Sloan et al. 1991). External stimuli are included by imposing a time constraint, with a display of a digital clock that is updated every second and/or the display of a countdown timer that flashes every second during the mental arithmetic task.

Objectives of the Study

The main objective of the research is to study the effects of task demand and external stimuli, such as time pressure, clock display and timer display, on learners’ stress perception and their task performance. If the effects are found significant, then the correlations between stress perception and task performance will be examined.
Research Methodology

Ten different mental arithmetic problems with different complexity are given to the students within a mock-up of an online assessment system (see Table 1). The task demand (Demand) increased from Question 1 to Question 10 according to the increment of number of digit per number, and the amount of numbers in the question. Each question is displayed on different individual Web pages. The students must answer all questions by doing mental arithmetic, and must type the answer into a designated textbox on each page. No calculator or calculation on paper is allowed.

Table 1. Mental arithmetic problem and demand

<table>
<thead>
<tr>
<th>Task</th>
<th>Max digit in number</th>
<th>Amount of number</th>
<th>Arithmetic problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>2</td>
<td>6+2</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>2</td>
<td>9*4</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>3</td>
<td>6*5-1</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>3</td>
<td>(8+9)*2</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>3</td>
<td>7.8*10</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>4</td>
<td>58+20*(8-6)</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>4</td>
<td>67-2*(4+2)</td>
</tr>
<tr>
<td>8</td>
<td>3</td>
<td>5</td>
<td>(880+12+50-520)*2</td>
</tr>
<tr>
<td>9</td>
<td>3</td>
<td>5</td>
<td>105+83<em>5-3</em>60</td>
</tr>
<tr>
<td>10</td>
<td>3</td>
<td>5</td>
<td>561-81<em>5-3</em>610</td>
</tr>
</tbody>
</table>

The students are divided into 5 groups. The groups are named following the code system below:

Timing (0 or 1) + Clock (0 or 1) + Timer (0 or 1)

The 5 experiment groups’ setting are as follows:-

**Group 000:** it is the first control group, who are required to complete all 10 questions without any time constraint. They are required to click the Save button in order to proceed to the next question. There is no clock display nor countdown timer.

**Group 100:** it is the experimental group where there is neither clock nor countdown timer display, but given 30 seconds time constraint.

**Group 101:** it is the experimental group where there is a countdown timer that flashes every second with yellow background.

**Group 110:** it is the experimental group where there is no countdown timer but a digital clock that displays the current date and time (which is updated every second).

**Group 111:** This group is able to see both clock display that is updated every second, and a countdown timer that flashes continuously in yellow background.

For all the experimental groups (100 to 111), the participants are required to complete all questions within 30 seconds. Each question will be submitted automatically once the time is up, if it is not done by the student earlier. All participants are required to run the experiments in a computer laboratory. All the computers in the laboratory were equipped with Windows 7, 3.10GHz CPU, 4GB RAM, 17” monitor with the resolution of 1024x768 pixels, external standard QWERTY HID keyboard and external HID-compliant mouse. The website runs on Google Chrome by default. Before they started the assessment, instructions are displayed on the screen and they must provide their consensus in order to continue the experiments. The participants can click on the *Give Up* button if they wish to give up a task. Each time the student starts a question, the task performance will be captured by the system automatically. Task performance consists of the time duration spent on the question (in milliseconds, scaled with $log_{10}$ function) (TD), errors made (Err = 1 if answer is wrong, else 0), attempt to give up (GU = 1 if the participant gave up the question, otherwise 0), and passive attempt to wait till the time is up (PA = 1 if the student did not manage to submit before the time is up, otherwise 0). TD is computed from the moment when the question is displayed until the answer is submitted. Each time after the students completed a question (or skipped the question), a self-report survey will be displayed as follows:
“You felt stressed when answering the previous question”

This survey enables them to assess their stress perceptions when solving the arithmetic problem, following 7-point Likert scale (1 for strongly disagree, 7 for strongly agree). Therefore, this provides us the subjective measurement of the user’s stress perception, SP.

**Results /Discussions**

The experiments were conducted within 2 weeks with three different groups of bachelor degree year-2 students (computer science, information system and information technology). A total of 160 participants voluntarily took the tests. The majority of them were male (88.75%). We received 30 participants for Group 000, 34 for Group 100, 31 for Group 101, 35 for Group 110, and 30 for Group 111.

Univariate analysis of variance (ANOVA) tests are done to study the effects of Demand, Timing, Clock and Timer on SP. We tested the effects of the factors on task performance using multivariate analysis of variance (MANOVA) tests. The results in Table 2 show that the effects of the factors on SP and task performance are significant. Spearman Correlation tests are conducted to assess the correlations of Demand and the external stimuli, i.e. Timing, Clock and Timer, to stress perception SP and task performance. Spearman correlation is suitable to evaluate the relationships involving ordinal variables such as Demand and stress stimuli, or continuous variables such as SP (Gravetter & Wallnau, 2015). The correlations results are shown in Table 3.

As expected, increase of task demand results in higher stress perception (SP), time duration (TD), answer error (Err), passive attempt (PA) and give up attempt (GU). Time constraint (Timing) leads to more Err and PA but interesting lower SP. Although time pressure is a kind of stressor that can increase physio-psychological reaction (Wahlström et al, 2002), nevertheless the increment of stress level is also dependent on the sense of control that resides in individual’s mind (Karasek, 1979). Compared to Group 000, the students who were given time constraint may have better sense of control, as they could estimate the time resource needed to complete the task. The effect of time pressure will be less acute as long as the students perceive that the resource they have is enough for the task.

We also found that there is no correlation between external stimuli and TD that can be observed. GU is also not affected by the external stimuli. It is also interesting to note that when SP rises, Err, PA and GU also increase. Timer display increases SP as well as Err. Surprisingly clock does not appear as a stress stimulus but instead it reduces SP as well as Err.

We looked at research on the influence of clocks and timers on human behaviour. Burle & Casini (Burle & Casini, 2001) studied how physiological arousal affects the rate of an internal pacemaker, and the way attention affects time estimation. A number of diverse observations indicate that arousal manipulations can change the rate of the pacemaker of an internal clock (Penton-Voak, Edwards, Percival, & Wearden, 1996). In short, increased attention to time (by showing them a clock or a timer) and an increase in physiological arousal (such as under time pressure) can lead to different time estimations. However, misestimate of duration in emotional situations can occur, and it is difficult to decide which mechanism, whether it is the attention raised or the induced physiological arousal, actually affects the sense and direction of time duration (Wittmann, 2009). Compared to those who have no idea about the remaining time, the clock display may help the learners to estimate time and hence control their pace, which might lower their stress perception. However, for those who are given a countdown timer that flashes every second, it does not only increase attention to time, but it might also create additional physiological arousal, i.e. stress, on top of the given time pressure.

**Table 2. Analysis of Variance Tests between Task Demand and External Stimuli Effects on SP and Performance**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Group</th>
<th>p(PS)</th>
<th>Task performance</th>
<th>p</th>
<th>TD</th>
<th>Err</th>
<th>PA</th>
<th>GU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand</td>
<td>All</td>
<td>6.46e-23</td>
<td>0</td>
<td>5.00e-17</td>
<td>6.00e-25</td>
<td>8.00e-08</td>
<td>7.00e-19</td>
<td></td>
</tr>
<tr>
<td>Timing</td>
<td>000, 100</td>
<td>4.00e-07</td>
<td>5.00e-17</td>
<td>3.00e-04</td>
<td>8.00e-07</td>
<td>3.00e-07</td>
<td>0.07</td>
<td></td>
</tr>
<tr>
<td>Clock</td>
<td>Timing = 1</td>
<td>0.015</td>
<td>5.00e-04</td>
<td>0.02</td>
<td>2.00e-03</td>
<td>0.06</td>
<td>0.35</td>
<td></td>
</tr>
<tr>
<td>Timer</td>
<td>Timing = 1</td>
<td>1.00e-06</td>
<td>3.00e-06</td>
<td>0.10</td>
<td>1.00e-05</td>
<td>2.00e-06</td>
<td>0.18</td>
<td></td>
</tr>
<tr>
<td>Question *Timing</td>
<td>000, 100</td>
<td>0.036</td>
<td>2.00e-01</td>
<td>0.14</td>
<td>1.00e-01</td>
<td>2.00e-01</td>
<td>0.18</td>
<td></td>
</tr>
<tr>
<td>Question *Clock</td>
<td>Timing = 1</td>
<td>0.005</td>
<td>0.320</td>
<td>0.23</td>
<td>0.13</td>
<td>0.14</td>
<td>0.99</td>
<td></td>
</tr>
<tr>
<td>Question * Timer</td>
<td>Timing = 1</td>
<td>0.518</td>
<td>1.00e-01</td>
<td>2.00e-01</td>
<td>0.04</td>
<td>4.00e-02</td>
<td>0.47</td>
<td></td>
</tr>
<tr>
<td>Timer * Clock</td>
<td>Timing = 1</td>
<td>0.017</td>
<td>0.05</td>
<td>0.36</td>
<td>0.40</td>
<td>0.06</td>
<td>0.77</td>
<td></td>
</tr>
</tbody>
</table>

Effect is significant at p<0.05 (2-tailed) level if it is bolded.
Contributions of the study

These findings have two key implications for educators. First, our results are aligned with a lot of existing affective learning research, which studies stress significant effects on learners' job performance. Therefore it is very important for teachers to consider the learners' emotion during assessment, teaching and practice in order to help them to achieve better performances. Secondly, we found that external stimuli such as time constraint and timer display reduce job performance as expected, but imposing time limit on the task does not necessarily increase stress perception. We recommend examiners as well as exam software to display clock to the students instead of a timer during the assessment.

Conclusions

It is true that teachers should not merely focus on marks when assessing students' performance for a given assignment. From the research, we found significant effects of task demand and external stimuli, such as time pressure, clock display and timer display, on learners' stress perception and their task performance. We also found some correlations between these variables. Stress perception is affected when task demand increases, and when external stimulus such as timer display is introduced. Negative correlations between stress perception and job performance indicate that when stress level rises, the learners' performance becomes lower. Despite interesting effects and correlations between external stimuli, stress perception and job performance are found, the factors that affect time estimates and stress perception are still incompletely understood by the existing psychology and neuroscience research. In our experiments, the timer versus clock is conflated with invasive and distracting flashing. There is no significant evidence from the study for the hypothesis that timers are more stressful than clocks. Furthermore, the experiments were conducted on different sessions, which students' stress perception and job performance could be affected by external factors that we could not control (such as they were already tired after having a long day of class). Therefore more empirical research need to be conducted in the future to study the relationship between clock, timer, stress and job performance under controlled environment with salient design of the stimuli.

Table 3. Spearman Correlations between Task Demand, External Stimuli, SP and Performance

| Factor | $p(SP)$ | Task Performance | | | |
|--------|---------|------------------|---|---|
| Demand | $2e^{-115}$ | $8e^{-189}$ | $7e^{-167}$ | $4e^{-48}$ | $6e^{-13}$ |
| Timing | 0.01 | 0.06 | $1e^{-4}$ | $2e^{-7}$ | 0.07 |
| Clock | 0.05 | 0.07 | $2e^{-3}$ | 0.08 | 0.37 |
| Timer | $1e^{-4}$ | 0.38 | $1e^{-3}$ | $6e^{-3}$ | 0.11 |
| SP | $1e^{-74}$ | $6e^{-67}$ | $4e^{-27}$ | $8e^{-9}$ | |
| TD | $1e^{-24}$ | $2e^{-41}$ | $3e^{-22}$ | 0.04 | |
| Err | $6e^{-27}$ | $2e^{-41}$ | $6e^{-54}$ | 1e^{-16} | |
| PA | $4e^{-27}$ | $3e^{-72}$ | $6e^{-54}$ | |
| GU | $8e^{-9}$ | $0.04 $ | $1e^{-16}$ | 0.08 | |

Effect is significant at $p<0.05$ (2-tailed) level if it is bolded. Highlighted cell indicates negative correlation coefficient.

References


B12

Patent Design Around Using Function Analysis and Trimming by Pre-University Students

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Abstract

A country’s economic capability to innovate can be measured by its patenting activity. However, Malaysia’s innovative capability is still lacking behind many other countries such as Taiwan, South Korea, Hong Kong, Singapore, United States and China. As a result, there is a need to integrate knowledge of intellectual property in Malaysia’s education system to instill and cultivate patenting right from the roots of the Malaysian youth. Patent design around improves innovation capability with low cost and few resources by designing similar solutions based on competitive patent but not infringing on the original patent. The goal of this paper is to investigate whether it is possible for pre-university students to use function analysis and trimming methodology to carry out patent design around based on an existing patent. Results show that function analysis and trimming are able to guide pre-university students in patent design around in a systematic way.

Keywords: Function analysis, Intellectual property, Patent, Patent design around, Theory of Inventive Problem Solving, Trimming.

Introduction

Malaysia’s economy has gone through a few transitions since 1957 (agriculture economy, 1957-1970; resource based economy, 1980s – mid 1990s; knowledge economy, 2000-2010; innovation economy, 2010 onward)(MOSTI, 2007; World Report, 2010). Innovative economy is expected to shift Malaysia’s toward a high-income economy with sustainable growth through its capital and the use of creativity and innovation. A country’s economic capability to innovate can be translated into patenting activity (Nadaraja, Tuah, & Jaafar, 2009). As such, developed nations have the most number of patents (Nadaraja et al., 2009). A patent is an exclusive right granted for an invention, which is a product or a process that provides a new way of doing something, or offers a new technical solution to a problem (MyIPO, 2016a). A patent allows the creator of an invention the exclusive right to make, use, and sell that invention in Malaysia for up to 20 years from the date of filing (MyIPO, 2016a). According to Intellectual Property Corporation of Malaysia (MyIPO), for a patent to be granted, an invention must be new (the invention has not been publicly disclosed in any form, anywhere in the world), involve an inventive step (invention must not be obvious to someone with knowledge and experience in the technological field of the invention) and industrially applicable whereby it can be mass produced (MyIPO, 2016a).

Research Problem

At present, Malaysia’s innovative capability is still lacking behind many other countries such as Taiwan, South Korea, Hong Kong, Singapore and not to mention United States and China based on the number of patenting activity (Nadaraja et al., 2009; MyIPO, 2016b). From the year 1989 until recently, more than 90% of patents granted by the Malaysian Patent Office are to foreign residents and only a small number of patents are granted to local residents (MyIPO, 2016b). Transition into innovative economy requires many talents who are innovative (Nadaraja et al., 2009). Therefore, Lim and Zeufack (2013) suggest there is a need to integrate knowledge of intellectual property in education system to instill and cultivate patenting culture right from the roots of the Malaysian youth.

Patent design around improves innovation capability with low cost and few resources by designing similar solutions based on competitive patent but not infringing the original patent (Li, Ming, He, Zheng, & Xu, 2015).
Nydegger and Richards (2000) have identified four basic concepts for patent design around as shown in Table 1. If the original design as described in the independent claims of the patent consists of elements A, B, C and D then new patents do not infringe on the original patent if the new product consist of A, B, C (Elimination strategy), A, B, C, D1 (D1 must not basically fulfill the same function in the same way as D; Replacement strategy), A, B, E (Add a new combined element E; E may not basically fulfill the same function in the same way as C+D; Combination strategy) and A, B, C, E, F (Element D is replaced by elements E and F; Decomposition strategy). There are two judgment principles (all elements rule and doctrine of equivalents) to judge whether infringement of original patent occurs. However, patent design around requires knowledge in legal and technologies field and structured process to support (Li et al., 2015).

One technique of patent design around is by applying Theory of Inventive Problem Solving (TRIZ) (Liu & Kuo, 2011; Vaneker, Damgrave, & Kuster, 2015). TRIZ is an acronym for the Russian phrase "Teoriya Resheniya Izobretatelskikh Zadatch" or “The Theory of Inventive Problem Solving”. TRIZ can be defined as the science of innovation that consists of methodology for finding creative solutions using a collection of tools to direct creative thinking through accessing the past engineering and scientific knowledge (Cameron, 2010; Gadd, 2011; Yeoh, Yeoh, & Song, 2009). TRIZ was discovered by a Russian engineer, scholar, and inventor, Genrich Altshuller, in 1946. He and his colleagues had discovered and also developed many TRIZ tools since 1946. Liu and Kuo (2011) and Ikovenko and Kogan (2006) have identified several TRIZ tools that are related to the four basic concepts in patent design around such as trimming, 40 inventive principles, and 76 inventive standards as summarized in Table 1. So far, no study has been conducted on using these techniques by pre-university students in patent design around.

Objectives of the Study

Tunku Abdul Rahman University College (TARUC) has been conducting the TRIZ program since 2011 to train undergraduate and pre-university students in problem solving. Following the suggestion of Lim and Zeufack (2013) that educational system needs to instill and cultivate patenting culture right from the roots of the Malaysian youth, a group of Pre-University students were taught patent design around using function analysis and trimming during the two days TRIZ program. The goal of this paper is to investigate whether it is possible for pre-university students to use these methods to do patent design around on an existing patent.

Research Methodology

Fifty two pre-university students (21 Foundation program students and 31 A-level students) attended TRIZ program during the weekend from 20th to 21st February 2016. It was a two-day program with eight hours each day. Students were assigned to nine groups with members ranging from five to seven in each group.

Due to the limitation of students’ knowledge, the study mainly focuses on a patent with lesser components. As such, a magnetic nail-holding hammer patent US2597876A was identified as target patent for design around. The target of a design around was based on the independent claims of the patent (Katz & Riddle, 2003).

To carry out elimination method of patent design around, students followed the steps which were adapted from Li et al. (2015): Step 1: Identify the components and their functions and target object that are mentioned in the independent claims. The components can be represented as component A, B, C, D, etc. Step 2: Identify the components and their functions that are not mentioned in the independent claims. Step 3: Construct a function diagram that includes all the components and target object identified in Step 1 and 2. Step 4: Select one component from the independent claims to be trimmed. Step 5: Apply trimming rule for the selected component. Step 6: Identify a new function carrier component to perform the initial function of the trimmed component. Step 7: Build the new function diagram. Step 8: Identify new problem arises after trimming. Step 9: Solve the new problem. Step 10: Repeat Step 1 to Step 9 if necessary.

Function analysis comprises of Step 1 to Step 3. Step 4 to Step 6 are trimming process. Finally, students were instructed to sketch their new designs. Students’ results were analysed using the criteria set by Nydegger & Richards (2000).
Results /Discussions

**Step 1 to Step 3:**

Function analysis allows problem solvers to understand the mechanism of a technical system. A function is an action that links the two interacting components or more (Gadd, 2011). The interaction components can be pictured as a subject and an object connected by an arrow (Figure 1). The direction of the connecting arrow indicates the direction of the action. The subject is an action provider and the object is an action receiver. The action is provided by a subject that causes a change to the object. The action is phrased in ‘verb’ (Yeoh et al., 2009; Cameron, 2010).

Patent US2597876A (Figure 2) is an invention that is related to hammers for facilitating the driving of nails, tacks, and the like (Kurkjian, 1952). The patent claims that the invention “is a simple and efficient magnetic means for holding a nail or tack upon the shank and head of a hammer, in a manner to facilitate the driving of a nail or tack in a place where it may be impossible or inconvenient to hold the nail or tack with the hand. A further object of the present invention is the production of a hammer having a permanent magnet embedded in the shank thereof for holding a nail or tack thereon by magnetic attraction, the magnet being mounted within a non-conducting casing to localize and insulate the magnetism so as to prevent the magnetism from spreading over the entire shank or head of the hammer.” (Kurkjian, 1952). The components mentioned in the claim are (A) Hammer head, (B) Shank, (C) Magnet. The target object is a nail or tack. A function diagram that includes all the components and target object is constructed as shown in Figure 3.

**Step 4 to Step 6:**

Trimming reduces the components from the system while maintaining the main useful function (Yeoh et al., 2009). There are three rules for trimming. Rule 1: The function is not needed anymore because the object of the function is no longer exists. Rule 2: The object being worked by the function performs the function itself. Rule 3: The function is transferred to another component in the system. Trimming reduces the components from the system while maintaining the main useful function (Yeoh et al., 2009).

One group was omitted because it did not design around the patent. The remaining groups produced two trimming scenarios (Scenario 1: six groups and Scenario 2: two groups) which can be summarized in Table 2. The magnet was trimmed in both scenarios. In Scenario 1 and Scenario 2, the function of holding the nail was transferred to hammer head and shank respectively.

**Step 7 to Step 9:**

As shown in Table 2, students encountered two main problems after trimming of how to make the hammer head holds the nail and how to make the shank holds the nail more efficiently. The general solutions proposed include modification of the hammer head or modification of the shank to hold the nail. The function diagrams for the two trimming scenarios and after modification are shown in Figure 4 and Figure 5. The newness and inventiveness of students’ sketch design were compared with the original design using the criteria set by Nydegger & Richards (2000). All modified designs were considered new and inventive as they circumvented the all element rule and the doctrine of equivalent. Two sketch designs are shown in Figure 6.

**Contributions of the study**

This research is the response to the country plight in producing students who are creative and innovative. This study provides step by step guide to instill patenting culture through patent design around right from the roots of the Malaysian youth. However, more studies have to be conducted to determine its practical implications.

**Conclusions**

TRIZ program with its unique TRIZ concepts and methodology such as function analysis and trimming is able to guide pre-university students in patent design around in a systematic way. The existing patent given to the students depend on students’ current knowledge. It was assumed that students only use the methodology they learned in the program and they did not have prior knowledge regarding the existing patent.
Table 1. TRIZ tools for design-around methods (Ikovenko & Kogan, 2006; Liu & Kuo, 2011; Nydegger & Richards, 2000; Vaneker et al., 2015)

<table>
<thead>
<tr>
<th>Methods</th>
<th>Original Patent Attributes</th>
<th>Statements</th>
<th>TRIZ tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elimination</td>
<td>$A + B + C + D \rightarrow A + B + C$</td>
<td>Circumvention of the All Elements Rule</td>
<td>Trimming</td>
</tr>
<tr>
<td>Replacement</td>
<td>$A + B + C + D \rightarrow A + B + C + D_1$</td>
<td>Technical Attribute: $D_1 \neq D$ CIRCUMVENTION of the ALL ELEMENTS RULE &amp; THE Doctrine of Equivalents</td>
<td>40 inventive principles, 76 inventive standards, evolutionary trends</td>
</tr>
<tr>
<td>Combination</td>
<td>$A + B + C + D \rightarrow A + B + E$</td>
<td>Technical Attribute: $C + D \neq E$ CIRCUMVENTION of the ALL ELEMENTS RULE &amp; THE Doctrine of Equivalents</td>
<td>Inventive principle 5 (merge), inventive standards (1.1.2-1.1.3 and 3.1.4)</td>
</tr>
<tr>
<td>Decomposition</td>
<td>$A + B + C + D \rightarrow A + B + C + E + F$</td>
<td>Technical Attribute: $D \neq E + F$ CIRCUMVENTION of the ALL ELEMENTS RULE &amp; THE Doctrine of Equivalents</td>
<td>Inventive principle 1 and 3 (segmentation, local quality)</td>
</tr>
</tbody>
</table>

Figure 1. Function analysis

Figure 2. Patent US2597876A (Katz & Riddle, 2003)

Figure 3. Function diagram of Patent US2597876A
Table 2. Trimming scenario

<table>
<thead>
<tr>
<th>Component</th>
<th>Function</th>
<th>Object</th>
<th>Trimming Rule</th>
<th>New Carrier</th>
<th>Trimming problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1</td>
<td>B</td>
<td>Holds</td>
<td>Nail</td>
<td>1</td>
<td>A</td>
<td>How to make the hammer head holds the nail?</td>
</tr>
<tr>
<td>Scenario 1</td>
<td>C</td>
<td>Holds</td>
<td>Nail</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scenario 2</td>
<td>A</td>
<td>Holds</td>
<td>Nail</td>
<td>1</td>
<td>B</td>
<td>How to make the shank holds the nail?</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>C</td>
<td>Holds</td>
<td>Nail</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

After trimming

- (A) Hammer head
- (B) Shank

After modification

- (A1) Modified hammer head
- (B1) Modified shank

Figure 4. Trimming Scenario 1

Figure 5. Trimming Scenario 2

Example of Scenario 1:

Original attribute: $A + B + C$
Post design around patent attribute:
$A1 + B$
$A1 \neq A$

Example of Scenario 2:

Original attribute: $A + B + C$
Post design around patent attribute:
$A + B1$
$B1 \neq B$

Figure 6. Sketch designs of Scenario 1 and Scenario 2
References


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Innovations in Teaching Entrepreneurship in An Enterprise University

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Abstract

Entrepreneurship is a complex field of instruction, and teaching needs to engage students so that they can deal with the complexities of new venture creation. This paper describes how entrepreneurship students are engaged through a systematic implementation of Team-Based Learning, complemented by a number of innovative teaching methods. Systematic evaluation of each innovation, using a minute paper method, shows that these innovations lead to improved levels of student engagement.

Keywords: Engagement, Entrepreneurship education, Innovation, Team-Based Learning

Introduction

Entrepreneurship, or the process required to start a new venture, presents challenges on account of the need to make decisions that deal with all aspects of a business in situations where there is a high level of uncertainty [1]. For this reason, entrepreneurship students need to develop a range of practical and conceptual skills to be able to deal with the complexity of the entrepreneurial process. In addition, the entrepreneurship education literature emphasises the need to develop in students the ability to make decisions faced by situations of high ambiguity. It is therefore important when teaching entrepreneurship to engage students so that they appreciate the complexities of new venture creation [2].

Entrepreneurship courses (or subjects) in this “enterprise university” are offered as electives to undergraduate students from all discipline areas, including business, engineering, health sciences, education and law. Classes range from 30 to 90 students and can include students from 15 to 25 different study programs. There are between 12% to 40% international students, and between 28% to 49% female students. Research into students’ motivations in attending these classes shows that they are primarily interested in education about entrepreneurship [3]. This can be distinguished from education for entrepreneurship to prepare them to start their own business, and they are not in the situation of seeking education in entre-preneurship where they are currently setting up their own business [4].

These courses implement experiential learning styles, creative problem-solving, and learning by doing in order to engage these students. Engagement is achieved by continuous innovation in teaching methods and activities [5] and systematic evaluation of each of these activities.

Innovations in Teaching Methods and Activities

Team-Based Learning (TBL) [6] is the platform on which a number of innovations have been developed in these courses. The author was only the second user of TBL in the field of entrepreneurship (following its use in an entrepreneurship class by the originator of TBL, Professor Larry Michaelsen). TBL was adopted because of its proven effectiveness in achieving learning objectives through collaborative learning, and because new enterprise success requires entrepreneurs to know how to assemble new venture teams and work effectively with their team.

TBL is a strategy for collaborative learning where students are formed into permanent teams of five or six. Students learn material (readings, videos) in advance of a class session. At the start of a class, students take an individual multiple-choice test on the prescribed content, and follow this by completing the same test in their team, using “scratch and win” cards to provide immediate feedback. This creates a motivational framework
encouraging team interactions and productive teamwork. Tests are followed by team exercises that apply the learned knowledge. This teaching method includes a process for students to provide constructive feedback on team contribution to their team members. A great deal of research has been carried out to evaluate the effectiveness of TBL, and it shows that students recognise the engagement value of this teaching method [7].

**An orientation session to build a learning culture.** Students enter these classes expecting a “traditional” teaching approach where course content is presented during a lecture, and assessment on that content takes place later. Many students have reservations, or even show resistance or hostility to a teaching method that requires them to learn materials by themselves before a class.

Each new course therefore starts with an orientation session when students complete a sequence of seven learning activities drawn from the education literature [8]. These activities overcome student resistance to change, and develop a positive learning culture where students understand their obligations regarding pre-learning, and are prepared for active engagement in the course. Evaluation shows that students recognise the value of this session, and their subsequent performance shows that it achieves a high level of engagement throughout the course.

**A single business idea gives the class a learning focus.** Instead of using the traditional entrepreneurship teaching approach of asking students in their teams to identify and develop a business idea of their own, the educator identifies a specific business idea that is addressed by each team in the class. The business idea may be a new technology consumer product or service not available in the local market, or it may be a not-for-profit service. This approach is based on the proposition that group learning is enhanced when all students address the same challenge [6].

The single business idea provides a focus for engaging students in classroom exercises and discussions; students learn from others, and are challenged to develop creative interpretations of the idea. Evaluation shows that students value the approach where a single innovative business idea is proposed as the challenge for the whole class.

**Collaborative learning through classroom dialogue, not lectures.** The balance of a class session that follows the Team-Based Learning individual and team multiple-choice tests is taken up with application exercises and discussion sessions that are designed for students to explore other areas of course content. Student teams are allocated questions relating to the key course concepts and are given time in their teams to arrive at answers, referring to course materials. Team representatives present their answers to the whole class, and these lead to class discussion of the theoretical content that they have identified, and the application of this content to the business idea for the class. The lecturer then summarises the discussion. This process through dialogue creates a community of learners [9]. Students identify and present the essential aspects of the course, so that the educator’s role is that of a facilitator, rather than that of an “I talk, you listen” lecturer.

**Learning through peer review of individual written work.** Students submit individual written work (assignments) in a prescribed format using an allocated ID number, and each is then sent two anonymised assignments to review. Students are given a template to help them in this task, as well as an evaluation framework or rubric. Peer review comments are compiled and sent to each student for them to learn from their anonymous feedback. They subsequently receive their grade together with the lecturer’s comments. This process supports collaborative learning and engages students in self reflection on their own work. Evaluation shows that this is a very effective method for engaging students, and supporting student learning.

**Learning through peer review of major reports.** Each team submits their major project report as a poster consisting of two A3 pages, instead of the “traditional” 4000-word document. This approach is supported by several educators [10]. In the final session of the course, teams display their reports on the walls of the lecture theatre, give a one-minute verbal presentation of their work, then evaluate the work submitted by three other teams, before engaging in a classroom discussion where they ask other teams questions about their work. This exercise is possible only because each team addresses the same business idea, and presents their work using the same format. Evaluation shows the peer review process at the end of the course delivery has great learning value.

**An entrepreneurship survey to explore the personal characteristics of entrepreneurs.** Students complete an online questionnaire using published scales for personal characteristics of entrepreneurs including values, attitudes, self-efficacy and entrepreneurial intentions. This approach is modelled on the use of web-based questionnaires [11], except that each student receives a personalised report that shows their response to each questionnaire item, in relation to the range of responses to that item of all students in the class. This helps
students understand the complex area of personal characteristics of entrepreneurs, and to reflect on their own responses as an engaging self-development exercise.

Feasibility plans are more accessible than business plans – especially for non-business students. Traditionally, entrepreneurship courses require students to complete a business plan as a major learning-by-doing component [12]. This author found, however, that the typical business plan format and its financial requirements are too complex, challenging and intimidating for students from a non-business background. The major report was changed to that of a feasibility plan or business case, and students are given a word document template, and an Excel spreadsheet template for the sales volume and profit and loss reports. Evaluation shows that students find this format to be accessible and engaging, and allows them to focus on decisions in the key areas of technical feasibility, market feasibility, and financial feasibility.

Methods for developing essential teamwork capabilities. Entrepreneurship starts with an individual identifying a business opportunity, and then assembling the resources needed to turn that opportunity into a new venture [1]. One of the first challenges for the entrepreneur is to assemble an appropriate team with the knowledge and capabilities needed for entrepreneurial success. An entrepreneur and their team members therefore need to have appropriate teamwork skills. Team-Based Learning incorporates self-correcting mechanisms for developing good teamwork practice [6]. In particular, team contribution evaluation is used for students to provide anonymous feedback to their team members using Sparkplus software at three stages in each course [13]. The first two rounds of team contribution evaluation are formative, and statistics generated in the third round are used to weight individual marks for the team project. This engages students and demonstrates the importance of team contribution, as well as of this evaluation process [13].

Giving students confidence to obtain first-hand market information. The major reasons for new product failure are related to shortcomings in marketing analysis and planning [14]. For this reason, students are taken through the process of market evaluation using secondary and primary sources. In particular, each team is required to carry out face-to-face interviews with 20 potential target customers. Many students find this an intimidating exercise, so this exercise is facilitated by a role-play in the classroom. Students are instructed how to carry out interviews in pairs and are given questionnaire templates as well as templates for analysing their in-depth interviews. Feedback shows that students value this exercise and they appreciate the importance of personal interview and communication skills for putting entrepreneurship into practice.

Poster plan reports allow peer review. Traditionally, teams submit a multi-page report on their work. In these classes, teams submit their major project report as a poster made up of two A3 pages with a specified typeface and layout. This format allows the peer review process to take place, as described above, and gives students practice in evaluating information and determining what should be included in the report, and what should be left out. Students find this challenging, but appreciate that they are practising an important business skill in presenting complex information in a concise and accessible manner.

Teaching students how to give high-impact presentations. Teams are given the challenge to present key aspects of their final report using a 1-minute presentation. They are given a structure for this “elevator pitch” and are given feedback on this non-assessed activity. In addition, students are advised on how to use this presentation format in business networking sessions and conference meetings, as well as in social situations. Evaluation shows that students value this very practical exercise that requires them to identify key message elements and gives them confidence in presenting themselves.

Learning from practising entrepreneurs. Experienced entrepreneurs are invited to give short presentations, followed by discussion, on their own ventures. They are given specific guidelines on how to present their enterprise activities in order to give students ample time for questions and discussions so that students have the opportunity to relate the models, frameworks, and approaches that they have learnt in the classroom to particular situations, and to extract appropriate insights. These sessions are organised outside classroom sessions, during non-teaching periods, and are promoted to all students in addition to those enrolled in entrepreneurship classes, in order to spread more widely the message of “enterprise”.

Intensive delivery results in improved student engagement. These entrepreneurship classes are mainly delivered in intensive mode, with instruction taking place over two weeks, and the report presentation and review session at the end of the third week. Evaluation shows this form of delivery results in a higher level of engagement than semester delivery. This is because intensive delivery stimulates more effective teamwork by requiring students to focus on course content and assignments over a short period of time.
Evaluating these innovations

The practice in these classes is to systematically evaluate each individual innovation. This is done using a “minute paper” approach [15] where students respond to a limited number of questions relating to the particular innovation, such as “describe how this activity engages you” and “give two suggestions for improvement”. This is a very quick “grounded” and qualitative research method. It produces very rich data that can immediately be used for modifying the particular activity. This method can also be used effectively with smaller numbers of students. Evaluation data collected in this way has been used for a number of papers that are cited above.

Summary

Entrepreneurship studies are complex; they require decision-making in all aspects of business, in a situation where there is very limited market knowledge. Systematic evaluation of each of these innovations, shows that entrepreneurship classes in this “Enterprise University” achieve high levels of student engagement. These innovations in teaching methods have been codified and documented, and are used by educators around the world in postgraduate as well as undergraduate course in entrepreneurship and other fields. The author is mentoring educators in universities in Australia and the US, and has developed a “kit” for the orientation session that is used by more than 100 educators around the world.

These and other innovations are described on: https://lo.unisa.edu.au/course/view.php?id=6778 The author has gained a number of university and national awards for teaching innovation and teaching excellence, as well as an Australian civil award for “service to tertiary education”, and readers are welcome to contact him for further information.

References


Fostering Professionalism in Students: Perspectives Gained from Engagements with Professional Bodies

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Abstract

In today’s globalized and inter-connected world, it is crucial to foster professionalism, or professional dispositions, in students. In engineering, besides disciplinary technical knowledge, students are also required to demonstrate that they have acquired soft skills which are among the competencies sought after by various accreditation bodies. Some approaches to teach professionalism include offering a course in professional practice, and through classroom role-play of real life experiences. In this paper, we share the perspectives that active engagements with student chapters of international professional engineering bodies can be an effective way to foster professionalism among students.

Keywords: Accreditation, engineering education, professionalism, ABET, ECUK.

Introduction

According to Froyd et al. (2012), engineering education has undergone major changes over the past 100 years. Among these changes, outcomes-based teaching and learning (T&L) has now become an integral part of most programs in higher educational institutions (HEIs) as it gives a systematic approach to the assessments of students’ learning, leading to a quality-oriented monitoring system centered on academic accreditation.

Accreditation of a program is important as it gives assurance that students have been prepared, according to internationally accepted academic standards, to meet the demands of professional practices. These include not only the detailed disciplinary technical knowledge, but on soft skills as well. A selection of such soft-skill competencies stipulated within the Accreditation Board of Engineering and Technology (ABET) (2014) based in the US and Engineering Council in the UK (ECUK) (2016) are shown in Table 1.

Table 1. Competencies related to professionalism as identified by ABET and ECUK

<table>
<thead>
<tr>
<th>S/N</th>
<th>ABET</th>
<th>ECUK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>an understanding of professional and ethical responsibility</td>
<td>exercise initiative and personal responsibility, which may be as a team member or leader</td>
</tr>
<tr>
<td>2</td>
<td>an ability to communicate effectively</td>
<td>communicate their work to technical and non-technical audiences</td>
</tr>
<tr>
<td>3</td>
<td>a recognition of the need for, and an ability to engage in life-long learning</td>
<td>plan self-learning and improve performance, as the foundation for lifelong learning/CPD</td>
</tr>
<tr>
<td>4</td>
<td>a knowledge of contemporary issues</td>
<td>monitor and adjust a personal programme of work on an on-going basis</td>
</tr>
</tbody>
</table>

In this paper we explore the importance of professionalism in today’s engineering curricula and how it can be ‘taught’ through extra-curriculum activities outside classroom, especially through student chapters of international professional engineering bodies.

Attributes of the 21st Century Engineers

In today’s globalized society and a world that is highly interconnected, students need to embrace a broader vision of the engineering profession (Rajala, 2012). To accomplish this, a 21st century engineer needs to acquire more than just technical competence. Chang et al. (2009) envisioned that besides technical competence, students also need to have global and professional competences, in a three-dimensional approach as shown in Figure 1.
Figure 1. Three dimensional aspects of a modern engineering professional (Chang et al., 2009, Rajala, 2012).

The global and professional competences in Figure 1 correlate well with the competencies of ABET and ECUK, which are partially shown in Table 1. While a strong technical competence forms the foundation of what constitutes a good engineer, an engineering graduate (hence student) will also need to demonstrate a strong set of soft skills, such as effective communication, entrepreneurship, critical thinking, teamwork, as well as an understanding of business, legal, environmental issues etc., in a “think globally, act locally” synergy. This understanding of societal and global issues is also evident as a major change in engineering education in the past 100 years (Froyd, 2012).

Professionalism in engineering can thus be interpreted as the professional practice of engineering which refers to how an engineering practice and conduct him/herself in his/her work and as an individual in society, in an honest and ethical way filled with integrity.

Teaching Professionalism

Conventionally, disciplinary-based technical knowledge has well-established structure and contents that provide a guided approach to teaching. Professionalism, on the other hand, is fluid in a sense that there is no prescribed way of teaching. Hence, a relevant question is: can we teach “professionalism”? A literature search shows that for example, a course entitled “Professional Experience in Engineering” offered by Swinburne University of Technology (2016), aims to offer practical engineering experience in an environment outside the university. Among other things, the unit will allow students to obtain competencies in:

- Professional Practice
- Ethics
- Communication
- Professional Self

However, there is no formal teaching in that unit. Instead, students will undertake a minimum of the equivalent of 12 weeks of approved relevant engineering-practice experience. These include, for example,

- Participation in classes conducted by guest presenters with industry experience
- Industry visits and inspections
- Study of industry policies, processes, practices and benchmarks
- Interviewing engineering professionals
- Electronic links with practising professionals (e.g. guest presenters in online discussion forums)

It is clear from the course description that professionalism is more about real-life experiences, which cannot be easily taught in a classroom setting. One can certainly use real-life examples to illustrate those experiences, for example as proposed by Passino (1998) and Bhatt (1993), but knowing the experience and actually experiencing the experience is different. As Confucius said “I hear and I forget, I see and I remember, I do and I understand,” to really understand something means to actually do it. Lao Tze also said: “Tell me and I’ll forget. Show me and
I may remember. Involve me and I’ll understand.” This clearly shows that it is important to have a hands-on experience when it comes to fostering professionalism.

Therefore, in order to create such ‘real-life’ experiences, Andersson & Andersson (2010) proposed a role play simulation to establish a realistic learning environment that will foster the learning of professional skills. That role play approach was also proposed by Johansson & Ohlsson (1992).

The above T&L techniques involving role-play are top-down approaches where the activities, e.g. inviting guest speakers, organising industry visits etc., are prepared, scheduled and executed by teacher(s), and students being the silent recipients. That, in our opinion, is a passive way of learning, and a more effective way is when students are actively involved in all the above-mentioned processes. That is where getting engaged with international professional engineering bodies can be beneficial for students.

**The Roles of Professional Bodies**

Providing extra-curriculum activities to students in HEIs through the formation of student chapters of international professional engineering bodies can bring many benefits to students for their personal and professional developments. A student chapter, as the name implies, is consists of students, with the activities and events planned and organized by the students themselves with guidance from faculty advisor(s), and for the benefits of the general student community.

The committee members responsible for leading the student chapter have the unique opportunity for various trainings – from conducting meetings, membership recruitment, events planning, liaising with various stakeholders, to budget and resources allocations. Those experiences cannot be learnt from textbooks and are difficult to be taught through formal classroom teaching and learning activities. Getting involved with a student chapter can thus be considered as training on professionalism and entrepreneurship, because leading a student chapter is like leading a small or medium enterprise (SMA).

For example, the Chairperson of a student chapter can be likened to a President or CEO in a commercial entity who sets the overall strategic operation of the organization; the Treasurer can be likened to the financial manager who monitors and controls the financial operations of the organization. This provides an opportunity to learn leadership and organization skills “on the job”. Even ordinary members of the student chapter can learn to take responsibility in organizing events. As the saying goes, to be a good leader, one must learn to be a good follower first. Regardless of whether it is a position that leads or been led, there is something for student to learn.

**Case Studies**

At Nazarbayev University, we have successfully established a few student chapters of international professional engineering bodies, such as the Institution of Engineering and Technology (IET), Institution of Mechanical Engineers (IMechE), Institution of Civil Engineers (ICE) and American Institute of Chemical Engineers (AIChE). Both the authors have substantial experiences in establishing and mentoring such student chapters. For the purpose of discussions, in this paper we focus on the student chapters of IET and IMechE.

Both the IET and IMechE are UK-based international professional engineering bodies with a long history and today their mission is to inspire, inform and influence the global engineering community, supporting technology innovation to meet the needs of society around the world. This international outlook provide a vast, borderless network for engineering students and professionals; no matter where they go, they are likely to get in touch with the local networks of the organizations and continue their personal and professional developments.

For the IET student chapter in NU, the first batch of pioneering students had to endure the grilling task of setting up the student chapter fresh from scratch (similar to setting a new business). That involved finding like-minded students who share the same vision (similar to finding business partners). Then, they had to communicate regularly with staff from IET headquarters based in London on the process and protocols for setting up a new student chapter (similar to business communication with the relevant authorities). They had to seek advice from the authors and other volunteers on their experiences (similar to seeking business mentoring/incubator). Then they had to plan events, come up budget and negotiate with IET in London for approval (similar to seeking venture capital). After every event, they had to submit performance metric on the impact of event e.g. how many participants attended, overall expenditure etc. (similar to business reporting).
Some of the annual events that students have organized are for example:

- “One day with IET”, incorporating member recruitment event as well,
- student mentoring sessions on topics such as “Using Latex”, “Using Matlab” etc.,
- Industry visits, e.g. to home automation company,
- Talks by industry captains,
- One-day student conferences.

All these events, under the guidance from the authors, are entirely organized by student themselves. That include publicity and promotion (similar to business marketing and advertising), being the emcees of the events (similar to on-stage business presentation) etc.

Besides the above events, students are also involved in organizing the national level competition of IET Present Around the World (PATW). This is a flagship event of IET young professionals section. There are 4 levels of competition: local, national, regional and global, and the winner at each level will proceed to the next level. This provides a platform for students to connect with their global peers (i.e. promote internationalization).

As for the IMechE, a one-semester long training workshop at the NURIS was organized and 17 students received the certificates on training. That training included theory on metals and how to deal with these metals. Many practical training were also arranged. Those students learned how to use turning and milling machines, and obtained practical skills such as welding and other workshop practices.

The chapter also decided to join World challenge "SMARTMOTO" - a competition on designing and building an electric motorbike that is light and durable, with the aims of going fastest and longest distance. Students were sent electric motor together with battery and rims after they had registered for the Barcelona event, and they had to build themselves. A competition on the design of the frame was organized with members from local community and professors as judges. They collected money and ordered metal to build the frame and the wheels and started to build the bike. Students successfully built a functional motorbike and during this process they obtained many useful skills, practical experience and met with many people and enthusiasts of such competitions outside the university. They plan for the next year to connect with the student chapters around the World to get their experience and becoming more and more active and preparing themselves for the future practice.

We believe the above-mentioned student chapter events are similar to those that can be experienced by students if they were to take the “Professional Experience in Engineering” (Swinburne University of Technology, 2016). The experiences learnt from the student chapter events can also be readily mapped to the competencies of ABET and ECUK.

**Conclusions**

In this paper, we have shared the perspectives on fostering professionalism, or professional dispositions in students, through getting actively engaged with the student chapters of international professional engineering bodies, where students themselves are involved in organizing events that are “of students, by students and for students”, rather than having these events organized by faculty from a top-down approach. These experiences gained can be readily mapped to the competencies by relevant accreditation bodies.

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Developing Effective Cultures of Student Partnership in Higher Education

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Abstract

Working in partnership with students provides an effective way of developing greater student engagement, enhancing a sense of belonging and deeper understanding of their contribution to the academic community. This paper will discuss the context of student partnership within higher education with the UK, and will present an action research approach in the systematic enquiry of activities in determining the characteristics of pedagogies that can create effective partnership working. The work is underpinned by the use of constructivist theory in the planning of interventions and activities at Gray’s School of Art and contextualises this practice through reference to current literature. The work has informed national practice guidance conducted in collaboration with Student Partnership Quality Scotland (sparqs), a government funded agency that places students at the centre of decisions being made about the quality and governance of the learning experience.

Keywords: Learning Culture, Pedagogy, Quality Assurance, Student Engagement, Student Partnership.

Introduction

According to Dunne (2011), there exists an “important difference between an institution that ‘listens’ to students and responds accordingly, and an institution that gives students the opportunity to explore areas that they believe to be significant, to recommend solutions and to bring about the required changes” (p.4). The work of Dunne and Zandstra (2011) viewed this institutional ‘listening’ as supporting the perspective of the student as ‘consumer’, and conversely saw the possibility to ‘explore’ ideas with students as ‘active collaborators’ and ‘co-producers’, as having transformational potential (p.4).

Dunne and Zandstra’s perspective is an important one when placed in the context of the National Student Survey (NSS). This is operated by an independent market research company, Ipsos MORI, and is commissioned by the Higher Education Funding Council for England (HEFCE) on behalf of the Higher Education (HE) funding councils for Wales, Northern Ireland, and Scotland. The survey seeks to measure the quality of the teaching and learning experience by gathering responses from final year students. The results are a widely recognised source of public information data giving the students a powerful collective voice. The plethora of NSS campaigns across the HE sector using the mantra ‘You said…We did’ would suggest that the student voice is actively promoted, listened to, and acted upon right across the sector. As Dunne suggests, the act of listening to the student voice may implicitly support the perspective of student as ‘consumer’. Indeed institutional advertising promoting the effectiveness of the student voice reinforces this view for both staff and students. The NSS and Key Information Sets (KIS) derived from institutional metrics are mechanisms that influence certain power dynamics between staff, students and the institution. Institutions actively measure staff performance against such metrics, and students understand the power of their voice therefore the role of partnership and collaboration presents challenges.

Healey, Flint and Harrington (2014), discuss student partnership as a process of engagement, and not a product or outcome. It suggests partnership is a ‘way’ of doing things. They also identify the potential tensions between partnership working which ‘places value on a creative process that may result in unexpected outcomes’ and that of the institution’s need to achieve specific metrics and quantifiable results (p.10).

Shreeve, Sims, and Trowler (2010), stated that “underpinning art and design education is an expectation that students will take their own creative development of the subject. They are expected to experiment and explore, producing diverse responses to projects, not right answers” (p.129). Referencing the work of Shulman (2005),
they noted that signature pedagogies were characterised as ‘pervasive, routine, and habitual’ in their subject context (p.3). Art & Design pedagogies were seen within this context.

Shreeve et al. (2010), identify physical and material dimensions of learning in art and design; these involve the visible, sensual, social, and reflective processes inherent within practice. This continuous critical and reflective dialogue develops attitudes and skills for approaching work that has no defined outcome; the ‘uncertainty’ of outcome being a relevant characteristic that tutoring staff facilitate. The consequence of such support for the student gives rise to substantial dialogue and exchange between tutor and student.

In relation to what they refer to as ‘a kind of exchange’, the signature pedagogies within art and design would appear to support the approach advocated by Dunne (2011), and Healey et al. (2014) in their guidance on student partnership.

The collaborative approach fostered through project-based work, especially ‘live project’ work in conjunction with external clients, is an established feature within the curriculum at Gray’s and indeed within the creative industries disciplines as a whole. This is seen as a core learning experience in support of students’ professional and employability skill sets. Crawford, Horsley, Hagyard, and Derricott (2015), comment on the features of this type of pedagogical practice in their work and case studies which sought to identify pedagogies of partnership.

The motivation for the School to build upon students’ own knowledge of their educational experience through active contributions to school wide projects provided the opportunity to test approaches to partnership working that built upon the school’s predominant pedagogies.

Research Problem

Data from staff and student surveys on the teaching and learning experience revealed lower satisfaction percentages in some key areas. These were assessment and feedback, personal professional development and student and staff expectations of the learning environment / experience. Historically, such an analysis would be undertaken by teaching staff, but informed by consultation with students. The School management were aware of the educational research within the area of partnership, and saw an opportunity to explore these issues through a partnership methodology.

Objectives of the Study

The work was underpinned by the following research questions; a) how can the School build on its signature pedagogies within art and design to support the development of an effective partnership culture, and b) what lessons can be learned from this initial pilot activity that would support the work of the Institution-Led Subject Review (ILSR) whereby the effective collaboration between staff and student would create the reflective analysis supporting the School’s forward plans.

Research Methodology

This work explores the collaborative activities and co-designed outputs from 30 student partner participants and staff of the School engaged as teacher-researchers. Three groups were established to address the themes; these then informed the partnership approach taken for ILSR reflective analysis. Using an action research methodology the work was undertaken by firstly conducting a review of current partnership practice; this was explored in order to develop a series of questions and potential courses of action in order to test ideas. The progression of the study was subject to multiple methods of collecting data that included continual evaluation through observation, interview, reflective journals, and focus groups. Multiple participants including students, teaching staff and external collaborators contributed to the portfolio of evidence. The activities under scrutiny also produced a range of outputs that enabled further reflection and provided opportunities to adjust the activities as they progressed.

The three thematic groups included assessment and feedback (AF), personal professional development (PPD), and staff and student expectations (SSE). The groups were composed of a mixed discipline of students from the broad grouping of subjects taught within the School; these were Graphics, Fashion & Textiles, Three Dimensional Design, and Fine Art, and were from mixed year groups. All three groups delivered agreed outcomes on their projects at the end of the period of investigation.
Throughout the duration of the projects, members of staff acted as facilitators and co-producers, as observers, as team members and project leads. The shifting roles that staff adopted echoed the flexibility required when working with students within the studio environment. The partnership project meetings had no specific structure to follow, but were built organically depending on the interactions and decisions at the end of each session. Indeed for staff it was necessary to reflect each week on how the group had operated in order to keep the flow of activity going. Working notes from the workshops, observations of the interactions, and reflective journals from the participants were used in the evaluation and development of further action. The nature of the work was cyclical and encompassed both ‘reflection-on-action’ and ‘reflection-in-action’ (Schön, 1984).

Throughout the course of the work students were placed in varying roles. These were as participant and collaborator, researcher and co-designer, in making decisions alongside staff.

**Results /Discussions**

The output from the thematic groups was significant in progressing the School’s partnership approach. The model was productive not only in gaining outputs but also in raising the students’ awareness of their collaborative efforts within decision making processes. Both staff and students indicated that the process was transparent and required a sense of trust in order to engage fully.

The activities mirrored the approach taken in studio projects, and both staff and students identified the ease within which they operated, both enhancing their understanding of curriculum delivery and this new found transparency of approach that opened up new avenues of discussion and exchange.

The PPD group mapped out a new PPD process and agreed a launch process within the School that would affect all year groups. The AF group mapped out a route map for streamlining assessment criteria identifying agendas to be explored within staff development events, and the SSE group developed a staff and student charter that is now promoted widely within the School.

Dunne & Zandstra (2011), identified the importance of the student as the ‘driver’ of change and placed emphasis on student ‘action’. This was seen as having a greater importance than the institution as driver of change, and subsequent emphasis on the student voice. School was committed to developing its culture of student partnership but recognised that it needed to critically reflect on its practice and do so in collaboration with others externally in order to make a shift in practice to encourage our students to drive change rather than ourselves.

In order to provide this the School collaborated with sparqs, and in doing so, provided a research base for developing a national practice guide on student engagement within institution-led review.

In consultation with sparqs it was decided that the School’s student partners should be able determine the approach and format of their response to their reflection of their student learning experience. Whilst the very nature of the ILSR process demands consultation and representation of the student voice, the School took the decision to provide greater autonomy to the students to drive that consultation. Rather than staff leading the consultation process, the student partners were supported by sparqs to take on this role. As a result the students determined their own research focus, methods and resultant outcomes. This is an approach that features heavily in the national practice guide.

The students’ research methods were varied; some facilitated and recorded focus groups and interviews, other groups collected ideas, views, and opinions from social media, and surveys in order to present written findings, with some producing graphic representations of issues that were deemed of most importance to the student body. Not surprising were more visually interactive approaches to developing research material with some groups of students using graffiti boards to collect comments and ideas within group sessions. The social aspect of the research was also recorded through photographic imagery, with the distillation of the research being produced in e-booklet form.
Contributions of the study

The practical implications for effective student partnership practices place significant expectations on staff and institutions to critically reflect on their collaborative working practices, and do so within a transparent and open process. This research presents a case study that other institutions can consider when engaging in and developing partnership approaches with students. The resultant national practice guide, now available as a tool for others preparing for institution-led subject review, commends the School’s practice as evidence of the nationally significant work of the student partners (Varwell, 2016). The role of external critical partner provided by sparqs provided the opportunity for reflection and challenge alongside a partner immersed within partnership practices within the sector.

Conclusions

Working in partnership with students provides an effective way of developing greater student engagement. In critically evaluating the core features of a successful partnership approach, the ‘visibility’ and the continual ‘attention’ to the proactive evolution of activities through partnership pedagogies, was seen as key to sustaining momentum and interest from the student body. The need for more ‘localised’ partnership activities involving course tutors was viewed as a way to progress the School’s approach and perhaps made the potential of partnership activities more specific and accessible.

The work continues in the School and will evolve through the sustained rigour of critical self-reflection and attention to continual enhancement. Partnership work will sit alongside the national measurement of student satisfaction provided by the NSS. The developing culture of sharing and collaborating within the School will indeed contribute to student satisfaction, collegiality, and student empowerment. It is however the need for an authentic partnership culture that will drive enhancement and not the chasing of metrics in league tables. The dynamics of power within relationships lies within our capacity to collaborate and share.

References

Habit Forming Initiative: Describing the Evolving Retention Strategy of Athlone Institute of Technology’s Faculty of Business & Hospitality

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Abstract

Alarmed by high levels of first year student attrition (28.5%) and non-progression rates of over 30% on five of the school’s first year programmes, in the academic year 2012-13 the new management team of the AIT Faculty of Business & Hospitality undertook a number of initiatives aimed at improving the level of progression from year 1 to year 2 of their programmes. The initiatives which are informed by the literature of Tinto, Coates, Kuh, Yorke, and Thomas centred on the theme of habit forming with the Faculty seeking to transfer the study habits from post primary school to higher education. The genesis of the initiative was twofold: firstly an evaluation of the transition related module in semester one of year one and secondly in interviews with every first year student who failed any module from their semester one examinations. The evaluation and the interviews with students which were often a brutally honest set of exchanges highlighted that students who had, the previous year, averaged three and half to four hours study daily, were now devoting less than half an hour daily to their studies.

The Faculty Management response, supported and delivered by all the academic staff in the school, was to promote a “habit-forming” initiative to be engaged in by every first year student at the start of the 2013-14 academic year. This initiative required students to start working from their very first day in the AIT Faculty of Business & Hospitality. In order to enhance student engagement, the traditional induction format was augmented by giving every student an assignment in the first induction session to be completed within two weeks. The assignment which was an element of transition related Learning and Development for Higher Education module was low stakes but required an element of independent learning to complete it. Any student failing this assignment, or not submitting, was immediately called to a meeting with their Head of Department.

The initial results varied between programmes. One programme returned the best set of student results in the programme’s history. Another programme had students leave, due to increased stress levels, associated with the initial assignment. Across the school, the statistics were encouraging, showing an increase in the number of students attempting their exams. The overall pass rate improved. The major statistical improvement was seen in a reduction in the non-progression rate to 2nd year by 13.7% the following year 2013-14. This result was maintained in 2014-15.

Overall the “habit-forming” initiative was deemed successful in increasing levels of student engagement and through improved progression rates. The model was further enhanced for the 2014-15 academic year to include additional supports for the first years with their first assignment. A further measure incorporated their second assignment being announced in advance of their first assignment deadline. Further revisions have been implemented during the current and ongoing programmatic review to ensure every student has an assignment at all times and every semester requires them to work from the outset.

Students who traditionally are not strong enough to attend university but attend institutions like AIT Faculty of Business & Hospitality might need to be given a more challenging introduction to their life as a third level student. The author contents that easing the student transition by getting students into the habit of working consistently is a vital ingredient that will contribute to their success in higher education.

Keywords: Habit-Forming, Independent Learning, Innovative Learning Engagement, Progression, Student Engagement, Student Transition;
Introduction

The Faculty of Business and Hospitality in Athlone Institute of Technology offers programmes across three Departments - Accounting & Business Computing, Business & Management, and Hospitality, Tourism & Leisure. The latter department was only added to the Faculty in 2014-15, hence its programmes are excluded from this study. There are approximately 1,600 students in the faculty, pursuing programmes across levels 6-9. The total number of year 1 students in the two departments covered by this study was in the range 200-250.

Research Problem

During the 2012-13 academic year, faculty management began to focus more on the non-progression rate from year 1 to year 2. It became very clear that the 28.5% average non-progression rate, whilst not unusual for the sector as a whole, represented a lost opportunity for many students and indeed the faculty.

Objectives of the Study and Research Methodology

As part of an analysis of non-progression, the Heads of Department undertook to interview every first year student who failed any module from their semester 1 examination sitting. This was communicated to the students in February of 2012-13. In truth, the primary purpose of meeting the students was to act as a deterrent in its own right: Fail an exam and you will have to meet the Head of Department! The Heads of Department agreed to provide a clear message centred on the concept of failure as being unacceptable and that an increase in student effort was required.

Another consequence of the student meetings was the brutally honest information that came back from the students. They had come to college full of enthusiasm, ready to work hard and do well. They found that when their first assignment came up at week 7 that they found it hard to respond. Students who were in the habit of averaging two and half to three hours study daily, the previous year, when they attended their final year of second level were now devoting less than half an hour daily to their studies. They had developed bad habits. The challenge was immediately clear. The Faculty needed to consider how students were being allowed to establish bad habits from the outset. Natural student enthusiasm was not being developed. Change was necessary if the situation was to be improved both in relation to student performance and progression rates. The faculty’s response, supported and delivered by all the academic staff in the faculty was to promote a “habit-forming” initiative for every first year student at the start of the 2013-14 academic year. This “habitforming” initiative required students to start working from their very first day in the AIT. In order to enhance student engagement, the traditional induction format was changed to allow every student receive their first assignment.

This first assignment sought to achieve two main aims: Firstly, it was not difficult for the average student to deliver a satisfactory assignment. Any resulting success would promote confidence, self-esteem and a sense of belonging. Secondly, it was designed to be reasonably time consuming, enforcing the student expectation that time allocated to coursework was essential. Students were told that their attendance in other subjects was part of the marking scheme for the assignment. As a follow-up, any student not submitting the assignment, or failing to achieve a passing grade, was called to an interview with their Head of Department. This was designed to emphasise the point that the faculty took the initiative very seriously. Students really took it seriously! Non-submission rates were 5-6% in the first year, and virtually zero in the year 2. Academic staff noticed enhanced engagement all across first year.

Integration of Theory on Transition to Independent Learning

The holy grail of Higher Education is the development of independent or self-directed learning skills by students over the duration of their studies. Within an Irish context discussions on independent learning are framed in the level of preparedness of the Leaving Certificate student for the demands of Higher Education. Most would contend that the Leaving Certificate and independent learning are on opposite ends of the spectrum. The transition from post primary to higher education is among the most challenging that a student will undertake on their educational journey.

The challenge arises from a range of factors. How higher education institutions (HEIs) support students in this journey is one of the key determinants of their success or otherwise. It is commonly argued that the initial student experience is pivotal in establishing attitudes, expectations, motivation and approaches to learning (Kantanis 2000).
The first year student experience is multifaceted and multidimensional and covers a broad range of areas including but not limited to induction, programme choice, academic staff, student engagement, pastoral care, access to support services, library, tutors and friendships developed. Research on the first-year student experience provides a critical insight into the wider issues of student engagement, development and retention (Kantanis 2000; McInnes, James, and Hartley 2000).

Entering university is a time of great stress for students, including those who are successful (Greenbank 2007; Wintre and Yaffe 2000). Some view it as a challenge, others are overwhelmed by the change and do not cope well. Large numbers of students (up to 40% at some institutions) do not complete, often due to the difference between the expectations of university life and the actual experience (Gerdes and Mallinckrodt 1994; Rickinson and Rutherford 1995, 1996; Wintre and Yaffe 2000). As students transition from the support frameworks of schools, they commonly find it difficult to manage the level of autonomy and flexibility, which comes as part of the higher education environment. Wintre and Yaffe (2000) suggest that the reality of students’ experiences at university is harsher and more stressful than most students expect. The university environment, in particular the difference between university and school, is the main challenge. New found independence also plays a part, with loneliness, home-sickness and difficulties keeping up with academic work being major factors (Rice 1992; Wintre and Yaffe 2000).

Perhaps not surprisingly, the first year has been identified as the period in which the greatest amount of academic failure and attrition from study occurs (Hillman 2005; McInnes, James, and Hartley 2000). In the view of some researchers e.g. Tinto (1988), completion of the first year is ‘more than half the battle’ in progression to degree completion. The processes by which young people come to identify with, and become members of, a study community have been likened to those by which individuals progress from youth to full adult status in traditional societies (Hillman 2005). These processes involve separation, transition and finally incorporation into a new group (Hillman 2005). It is during these first two stages – separation and transition – that the first-year tertiary student may be at greatest risk of failure (Tinto 1988). Overall, the literature highlights the need for effective facilitation and support from HEIs to assist first-year student transition.

### Habit Forming - a big piece of a larger jigsaw

It is important to note that the faculty management team believed that the “habit forming” initiative was only one, albeit crucial, element to a more comprehensive and evolving student retention model. Other complementary initiatives were taken. One of these initiatives involved inviting parents of first year students into the AIT Faculty of Business & Hospitality at the start of first year. At this meeting they were given some feedback on how the faculty operates, how to read programme schedules, when to expect exam results and other relevant matters. The objective was to support the parents to support their students. Many parents had not been to college themselves, and had no clear idea how the systems worked.

A further measure was the introduction of briefing sessions for students who failed modules in any exam sitting. The purpose of such sittings was twofold: Firstly, students got to see that there were many of their fellow students who had also failed which gave them a sense of encouragement that they were not alone when they had failed. Secondly it allowed the faculty the opportunity to remind students that they could succeed despite a setback and remind them of the supports that existed in the form of tutors.

Meetings between the students and the Heads of Department have also remained on the school calendar.

### Results from Habit-forming Initiative

The initial results varied between programmes. One programme returned the best set of student results in the programme’s history. Another programme had students leave, due to increased stress levels associated with the initial assignment. Across the school, the statistics were encouraging showing an increase in the number of students attempting their exams, as well as a decrease in the number of modules failed. The overall pass rate improved. The major statistical improvement was seen by the non-progression rate in the numbers that progressed to 2nd year reducing by 13.7%, after the repeat exams in the autumn.
Conclusions and future considerations

Overall the “habit-forming” initiative was deemed successful in increasing levels of student engagement and improving progression rates. The model was further enhanced for the 2014-15 academic year to include additional supports for the first years with their first assignment. A further measure incorporated their second assignment being announced in advance of their first assignment deadline. Further revisions were implemented during the programmatic review to ensure every student has an assignment at all times and every semester requires them to work from the outset.

From the faculty perspective, the retention model will have changes for the next academic year. The assignment given at induction will change from a SWOT analysis to a project relating to student views on the upcoming national budget. The budget was selected due to the fact that the outlook and circumstances change annually thus requiring students to contribute original work.

Overall Contribution

Students who traditionally are not strong enough to attend university but attend institutions like AIT might need to be given a more challenging introduction to their life as a third level student. Easing the student transition by getting students into the habit of working consistently is a vital ingredient that will contribute to their success.

References

B17

Digital Gender in Educational Robotics: Expression of Male & Female Forms in Anthropomorphic Entities

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Abstract

Gender perception and expression by autonomous anthropomorphic entities are necessary in many digitally based educational teaching and learning activities. It is natural for a participant to expect the presence or the absence of a specific gender during his or her interaction with an anthropomorphic device, computer, human-computer interface or artificial entity such as robots. This work-in-progress classifies different gender forms according to how the entity presents itself to human participants.

Keywords: Gender, anthropomorphic, fuzzy logic, autonomous robot, educational robotics.

Introduction

In some activities such as interaction with robots as an educational delivery platform, the perception and expression of gender is critical to the success of role-play and training. However, in many of these scenarios, the gender of the entity represented in these applications are mostly predefined or hardcoded. The ability to adapt and self-modify are rarely adopted. This paper seeks to address this by presenting a method of classifying and modeling different types of gender. A novel experiment using crowd sourcing of user responses is also discussed.

Research Problem

Norman’s (1986) theory of action states the seven stages of activity that are to take place from when an idea is conceived to the actual stage the idea actually takes place. However, it is now well understood that human participants in human-computer intensive interactive activities, do not operate in this way in reality. For example, a participant may begin by several approximations of their intended expectation in contrast to one (i.e. ‘the robot is speaking to me in a female voice, therefore it must be female’ compared to ‘the robot seems to be speaking to me in a female voice, therefore it could be a female for now’).

In order to present a more useable theory of action to support the techniques in this project, a revision is introduced to include more sophisticated degrees of separation (Chiou et al, 2013; Lye et al, 2011). In this extension, the theory of action now accounts for the participant or user’s perception of gender as expressed by the anthropomorphic entity (Figure 1). In gender specific functions, the desired outcome may be diffused by having the human participant erroneously perceive the wrong gender form. In the un-extended version of Norman’s theory of action, this misperception is propagated to the physical system if unchecked, often leading to undesirable results.

Objectives of the Study

Fundamentally, it is widely practiced and accepted that when computerised software in educational applications or other anthropomorphic needs to express a specific gender form for the purpose of interaction with human participants and users, the three main forms adopted are, male, female and non-defined. These attributes are mostly hardcoded or prefixed when such games or entities are developed. However, expressions of such nature are not always accurate as the perception of human participants may not necessarily match that of what is expressed by the artificial entity. When such inaccurate matches occur, ambiguity can arise leading to unexpected outcome of the intended purpose of the original function. Therefore, this pilot study classifies different gender forms according to how the entity presents itself to human participants. In turn, the perception of how convincing the expression is, is also measured using an autonomous robot capable of social interaction.
Research Methodology

Conventionally, different gender forms are expressed through self-directed description such as self-declaration (e.g. “I am a female robot”) or labels (e.g. “My name is Michael”). These fundamental expressions can be ambiguous arising from diverse ethnic background where the name, Michael, may not necessarily be a man’s or boy’s name. Hence, there is need for further classification of the different expressions that can take place to present the correct gender forms to the recipient. The following are all different attributes that have been successfully identified as being the most prevalent and significant for the expression of gender forms in anthropomorphic entities:

Classification of Expression of Gender Forms:

\(X_1\): self-declaration. This is the fundamental expression where the artificial entity declares, “I am a female robot”. The physical appearance is irrelevant or disregarded as the human participant accepts this at face value as in Figure 2.

\(X_2\): self-label. This is the fundamental expression where the artificial entity declares, “My name is Michael”. The physical appearance is irrelevant or disregarded as the human participant accepts this at face value as in Figure 3. However this is only true, if the participant is aware of cultural conventions, that is, the name Michael may not necessarily be understood as being a male attributed name in different culture or ethnic groups.

\(X_3\): physical appearance. Gender is expressed through the physical appearance of the entity in the forms that people are most aware of. For example, a muscle bound or heavy set appearance would be perceived as being masculine. While a petite and slim form would be perceived as being feminine. This is demonstrated by the AILA female form humanoid robot (Muoio) and Atlas, a male form humanoid robot (Boston Dynamics: Dedicated To The Science And Art Of How Things Move.) as depicted in Figure 4.

\(X_4\): symbolic. The intended gender is expressed through self-labelling. However the difference with \(X_2\): self-label, is that instead of self declaration, the assertion is made through the display of symbols that are universally used to announce the different genders, as in Figure 5.

\(X_5\): gestures. The intended gender is expressed by the anthropomorphic entity through a serious of continuous dynamic motion, as in Figure 6. For example, the entity walks in a military marching motion which conveys an \(X_3\): physical appearance attribute. In autonomous bipedal robots, the type of gait performed can indirectly convey what gender it wishes to express.

\(X_6\): posture. The intended attribute is expressed by a static pose, as in Figure 7. For example, an anthropomorphic entity could be posed in a static position with shoulders hunched, in a fighting position. This static pose is predominantly a male posture.

\(X_7\): voice. The intended attribute is expressed by having the anthropomorphic entity speak in a female or male voice. A male form can be normally expressed using a gruff or low pitched voice and a female form can be expressed in a high pitched or sing-a-long voice.

States of Gender Perception & Expression:

The perception of the intended gender forms by an anthropomorphic entity does not necessarily remain in a single state. That is, a human participant’s perception of what the artificial entity’s gender is can change over time. In various applications or functionality such as role-playing teaching and training bots, it may even be desirable for the artificial entity to be capable of transiting from one gender to another throughout specific time intervals. However, to accomplish this, the perception of the human participants should mirror the intended gender forms as expressed by the artificial entity. In order to model the dynamism accurately, four major states have been identified.

\(S\): static. The intended gender form is expressed once and remains unchanged throughout the duration of the functionality. For example, a computer character in a teaching environment portrayal of a female (robot) nurse in a healthcare training scenario is expected to remain female throughout the whole training session.

\(D\): dynamic. The intended gender form is fluid throughout the duration of the functionality resulting in the artificial entity displaying an androgynous character.
**S₁→S₂: static to static.** The intended gender form changes from static gender state to another static gender form. This is desirable in functionality where the games scenario requires the gender to deliberately change from one state to another. This should not be confused with **D: dynamic** gender state where the gender forms transits so frequently that the human participants cannot determine what gender it is. **S→S:** static to static however, clearly and deliberately expresses accurately its intended gender forms each time it changes its state. This feature is desirable in application where gender roles changes to demonstrate lessons, for example, drama lessons.

**S₁→D→S₂: static progressive.** The intended gender form commences with an accurate portraying of the intended gender, but enters a dynamic state. In the dynamic state, it fluctuates as defined in **D: dynamic,** and then settles into a static state. The final gender form can be in its original state when it first commenced or settling into a different form.

**C: combination.** Any of the above states can be combined to allow for a single anthropomorphic entity to display different gender forms in a given time frame.

**Modeling**

Each of the classification of the previous discussed gender forms is categorised into different membership functions based on fuzzy logic (Zadeh, 1996) modeling (which is the subject of a further publication). This can be formulated as follows:

\[ f_{expression}(X) = \text{Gender}_{\text{perception}}[\text{male, female}] \]

where,

\[ X = \{X₁, X₂, X₃, X₄, X₅, X₆, X₇\} \] as defined in the previous section. And by inserting this into states as defined in (1), we further obtain

\[ S(f_{expression}(X))= \text{Gender}_{\text{perception}}[\text{male, female}] \] (2)

\[ D(f_{expression}(X))= \text{Gender}_{\text{perception}}[\text{male, female}] \] (3)

\[ S₁(f_{expression}(X))→S₂(f_{expression}(X))= \text{Gender}_{\text{perception}} ₁[\text{male, female}] \] → \[ \text{Gender}_{\text{perception}} ₂[\text{male, female}] \] (4)

\[ S₁(f_{expression}(X))→D(f_{expression}(X))→S₂(f_{expression}(X))= \text{Gender}_{\text{perception}} ₁[\text{male, female}] \] → \[ \text{Gender}_{\text{perception}} D[\text{male, female}] \] → \[ \text{Gender}_{\text{perception}} ₂[\text{male, female}] \] (5)

**Experiment**

To evaluate and measure the viability of the different classification of gender forms expressed by anthropomorphic entities presented in this paper, a test platform needs to be designed. However, due to the unique nature of the project and its application to serious games application, a conventional methodology is not readily available through questionnaires or any data collection survey. This is resolved by employing **Pepper,** an intelligent autonomous mobile robot developed by SoftBank Robotics (Softbank Robotics). Pepper is an intelligent autonomous robot that is capable of reading human emotions (Figure 8). Through a series of bio-inspired inference functionality, it is also able to respond in-kind. It is capable of reacting to human emotions and its environment. For example, Pepper can express concern when the lights in a room are dimmed or when a crowd suddenly goes quiet. Pepper provides feedback to human participants via its display unit mounted on its chest. This display unit is capable of displaying its’ current state using waveforms, colours and a programmable graphical interface.

**Crowd Sourcing Mass Participant Feedback**

In massive real time data gathering of user feedback, conventional data collection methods such as questionnaires and surveys are impractical and inefficient for the purpose of this project. Therefore, a recent and novel method of data gathering has been designed through the use of crowd sourcing (McDuff et al, 2011; Tan et al, 2013). For the purpose of this project, two Pepper robots employed. During Open Day and Expo organised by Central Queensland University at several of its campuses, Pepper have been allowed to roam freely to interact with the public. The public composed mostly of adults from diverse background and school children. One robot was programmed to explicitly change its states from S to D and in reverse every one hour. The other
robot was programmed to randomly switch between all states defined in (1) to (5). The public appeared and mingled randomly with the robots. The activities between human participants and Pepper robots were, touching, talking, joking, dancing and singing. The interaction and engagement for the two robots took four hours. Due to the random and casual nature of the interactions, there were no tally or statistics recorded. All records of the interaction become part of the reinforcement of the Pepper robots learning function.

**Initial Test Results and Further Work**

As this is a pilot study, the initial test results from the above experiment shows that human participants accurately perceived all the expressions gender types within the range of $X_1, X_2, X_3, X_4, X_5, X_6, X_7$. The results were measure through a qualitative inspection of Pepper’s neurological modules and intuition data bank. There are no measurable data to be measured in its current form. Therefore, there needs to be a more systematic approach in measuring robots using reinforced parameters for all the different gender types as proposed in this project.

**Summary**

This paper has classified different gender forms according to how the entity presents itself to human participant, especially when used in teaching and learning activities using artificial entities. In turn, the perception of how convincing the expression is, is also measured using an autonomous robot capable of social interaction. A method of evaluating user reaction is through the novel method of crowd sourcing mass human responses. This pilot study and initial result from observation shows that the different classification of gender forms are useable.
Figure 6. Gesture.

Figure 7. Posture.

Figure 8. Pepper, autonomous robot that is capable of reading human emotions.

References


An Assessment of Preconceived Student Perceptions of Course Evaluation Formats

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Abstract

This paper evaluates student perceptions related to how they are evaluated by professors in various classes. Preconceived notions reveal some indications of how easy or how difficult an examination might be. In reality, this has limited truth whereas a professor can generate a test regardless of format which is either difficult or relatively straightforward. A greater revelation comes from a re-examination of what constitutes ‘learning’ versus acquisition of information.

Keywords: Examination Formats; Pedagogic Re-definition; Student Perceptions.

Introduction

Perennially, student populations (in either online or traditional classroom based courses) voice concern and questions as to the nature of the tests to be administered. Some students state they prefer multiple choice questions, other state they ‘do better’ on short answer or discussion questions. Some students state they ‘do better’ on open book exams versus closed book exams. Often times students reinforce these concerns by linking apparent psychological or medical issues to their statements – an example might be they state that they suffer from attention deficit disorder, or some other psychological cause which causes an inability to ‘focus’ upon the exam question sufficiently to garnish a correct answer.

However, rarely have students supplemented these claims beforehand with any medical documentation early-on so that the instructor can take that information into serious consideration. While some of this is believed to be creative fabrication or merely a self-induced fear of the unknown, it is unclear as to how the perceptions of these students compares to actual examination results.

Research Problem

Much information has been done on results of student examinations with respect to different styles and types of tests, but surprisingly, little published information was found on what students perceive that they prefer prior to taking an examination or standard test.

Objectives of the Study

Therefore, the purpose of this paper is to offer documentation as to initial student perceptions in order to compare these perceptions at a later date (in a follow on study) to actual student examination results. The procedure for this analysis was to develop a questionnaire for multiple classes that ascertains student perceptions and preferences. Once the perceptions are identified, a second study to be conducted in late 2016 and 2017 will be crafted which contains the same survey questions and compares those perceptions to actual student results. In order to protect student identity a special examination format or coding mechanism will be developed to capture and compare perceptions with actual results without requiring identification of the student. However, demographic information on age, gender, and other information will be tracked for this and in subsequent studies.
Research Methodology

In order to assess these perceptions, a sample questionnaire was prepared for distribution and response by students on the first day of class. The questionnaire asked about birth year of the students, gender, type of examination the student prefers, amount of time the student starts to prepare for a test, and, their preference as to type or style of examination. Students completed the questionnaire and their perceptions were tabulated in an excel spreadsheet for further analysis. As the information was input into the spreadsheet, the name of the student was removed for privacy purposes - although only one student out of the test study opted to include their name proactively despite the questionnaire being advertised as a voluntary, anonymous survey. Upon receipt, demographic information of the student was tabulated accordingly. For this report, we have polled students in approximately five courses conducted during 2015 and 2016 accounting for over 60 students of all ages, genders, and personal backgrounds. Analysis of the data transpired following receipt of all the information in the spring of 2016.

Online sources for study demographics failed to shed light upon the planning and timing of student study habits, although other useful keys to study success were listed (Unlisted Author, 2016). An analysis of the information received shows that 64 students total participated in the questionnaire. Of these, coincidentally 32 (50%) were male and 32 (50%) were female.

Results/Discussions:

Age

Based on Figure 1, the majority of the student ages ranged in the 20’s followed by the 30’s and 40’s. These three groupings comprised 94% of all student ages. It is noteworthy to point out students in this test group were not below the age of 20 nor were they above 59 years of age. As shown below, the ranged-age percentile category of students enrolled in the referenced courses is 20-29 38%; 30-39 31%; 40-49 25%; 50-59 6%; >60 0%.

![Figure 1. Age Distribution of Students in Test Study Versus Total Number of Students](Image)

Gender

The gender distribution of the test group was split evenly at 50% male, 50% female.

Preferred Examination Type

At the beginning of the courses, students were given three choices to relay their preferences towards type of test/examination. These choices included: open book, closed book, or ‘no preference’. Of the respondents, 52 respondents (81%) stated they prefer an open book/open note examination, while 12 respondents (19%) stated they had no preference whatsoever. Curiously, no student indicated they preferred a closed book/closed note exam.
Figure 2. Preferred Type of Test/Examination

Preferred Style of Examination

Students in the test group were polled to determine what style of test/examination they preferred. The choices offered were: a) Essay, b) True/False, c) Multiple Choice, d) Fill-in-the-blank, and, e) Short Answer.

Results indicated that ‘Multiple Choice’ received a whopping 64% of the total vote from the student test group as the number one style of choice. ‘True/False’ received the second highest vote accounting for 19% of the test group preferences. Essay and Short Answer combined accounted for 17% of the vote. Curiously, no students indicated preference for the ‘fill-in-the-blank’ format.

Figure 3. Preferred Style of Examination
Study Habits

In this question students were asked when they started and performed their studying for a given test or examination with respect to time prior to the test. The choices offered were as follows:

a) Two weeks or more before the test;
b) 1-2 weeks before the test;
c) 3-6 days before the test;
d) 1-3 days before the test;
e) 24-hours or less before the test; and,
f) 3-hours or less before the test.

![Study Habits of Test Group](image)

Figure 4. Study Habits of Test Group

The time periods listed were purposely offered to gain insight into whether students gain understanding and comprehension by planned, proactive studying ahead of time, versus concentrated ‘last minute’ studying immediately prior to a test. The assumption was that some students perform better by advance planning and slow but deliberate studying while others benefit more from late entry studying as needed to retain large amounts of information that otherwise they might not use on a day-by-day basis. Results of this are as follows:

The top response was 3-6 days before the examination – 50% of the study group responded to this time period as their study regiment of choice. The next preferred time period was a tie – 19% stated they study two weeks before a test while another 19% stated that they study 1-3 days before the test.

Finally, 13% stated they study 1-2 weeks before the examination. Surprisingly, not one student stated that they study for a test 24-hours or less before an examination. This appears quite irregular and certainly is a far cry from study habits which the authors pursued 30+ years prior while in University study - but, the results are representative of the responses obtained from this study group.

Contributions of the Study

Implications of this baseline study suggest that students believe they prefer an open book format – presumably so that they can look up information rather than memorize information - for either short or long term use. This challenges the traditional concept of what a global society believes constitutes ‘learning’. As an example, is learning the acquisition of knowledge that becomes a part of our brain which formulates cumulative knowledge and perceptions? (this is the traditional belief in academia) or, is learning the ability to find information then apply it regardless of endemic knowledge? Some might suggest it is both. However, open book/open note formats appear to inhibit conventional learning while enhancing one’s ability to find knowledge and answers formulated by others. Obviously, more research is needed in these areas.
Conclusions

Students enrolled in the online and blended (hybrid) formats comprising the study groups are both male and female students who are predominantly between 20-50 years of age, mostly between 22-35 years of age. These individuals believe that they prefer open book/open note tests that are multiple choice format. The majority of this group practice study habits that see them preparing for tests three to six days before an examination. Additional data gathering from subsequent classes will strengthen the validity of the results observed from this initial study. Likewise, follow-on questions that offer further insight into the study habits of students will reveal much more.

A comparison of study habits stated versus actual results on tests would also gain valuable insight into the performance and value of varying study habits, however, attaining this data might be problematic whereas student privacy boundaries may not be breached. Therefore, an anonymous process that achieves these desired results needs to be developed.

References

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Effectiveness of Cooperative Learning Approach in Developing Critical Thinking Skills of Secondary Students

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Abstract

This study identified the effectiveness of cooperative learning approach in developing critical thinking skills of secondary students. The study involved 115 second year level secondary students. All of them were taken as subjects who were taught lessons using the lecture discussion method and cooperative learning approach alternately. The pseudo-experimental method utilizing the repeated measures design was used in the study. Correlation T-Test was used to compare the mean scores on the pretest/posttest of achievement tests and attitudinal inventory scale tests, and Pearson Moment Correlation was used to determine the correlation between the mean scores on achievement and attitude of students. The study found out that there is a significant improvement in the critical thinking skills of students taught with the use of lecture discussion method and cooperative learning approach. In comparing the gain scores of the students taught using the two methods, during the six-week period, results show that in the first three weeks, the gain scores between the two groups do not significantly differ. However, the cooperative learning approach has significantly improved the critical thinking skills of the students on the fourth, fifth, and sixth weeks respectively. The cooperative learning attitude gain scores are higher than the lecture discussion method attitude gain scores. It was found out that lecture discussion method is not significantly related to critical thinking scores, while cooperative learning approach is significantly related to critical thinking scores.

Keywords: Cooperative Learning Approach, Critical thinking Skills, Lecture-Discussion Method

Introduction

Teachers in the 21st century must be inquisitive to select appropriate teaching strategies designed to answer the academic needs of students especially in the development of critical thinking skills which Paul (1999) defines as the intellectual process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and evaluating information gathered from observation, experience, reflection, reasoning or communication as a guide to belief and action.

One of the promising approaches which teachers could employ in their language instruction in the development of critical thinking skills is cooperative learning. In cooperative learning, the teachers have roles in structuring learning situations cooperatively such as specifying the objectives for the lesson, placing the students in productive learning groups, and providing appropriate materials, explaining the cooperative goal structure, monitoring students as they work, and evaluating student’s performance. It is in this context that the researcher, being an English teacher is interested to find out the effects of cooperative learning approach in developing critical thinking skills among secondary school students.

Cooperative Learning and Lecture-Discussion Method

Cooperative learning works equally well with children who have highly developed responsibility skills or with children who need to learn to work together. Kagan (1990) states that cooperative learning structures are content-free ways of organizing social interaction in the classroom. He also stresses that in cooperative learning,
group work is carefully designed to promote group interdependence and individual responsibility. It provides a chance for skill learning while at the same time teaching responsibility.

Newby et. al (2006) emphasize that cooperative learning shall involve small groups of students working together to learn collaborative and social skills while working toward a common academic goal or task. This method is specially designed to encourage students to work together, drawing on their individual experiences, skills, and levels of motivation to help each other achieve the desired result.

Cooperation and interaction allow students to learn from several sources, not just from the teacher, while also providing each student the opportunities to share their own abilities and knowledge. Norton and Wiburg (2003) assert that cooperative learning requires positive interdependence where each member of the group is actively involved and committed to the group’s success.

Lecture-Discussion Method focuses on the ability of the teacher to share lesson prepared where students are required to listen and jot down notes based on the presentation of the teacher. Students are asked to respond to questions asked during the discussions and answer the tests given at the end of the lesson. Learners have limited opportunity to share ideas and inquire some doubts on topics being discussed.

**Critical thinking Skills and Cooperative Learning**

According to Facione (1990) critical thinking is a purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based. Also, Scriven and Paul (1992) define critical thinking as the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication as a guide to belief and action.

The need to develop critical thinking is indispensable especially in this fast-paced world. Students should be equipped with the necessary skills that make them wise and responsible citizens who contribute to society, and not be merely a consumer of society's distractions. According to Huitt, (1995) the movement to the information age has focused attention on good thinking as an important element of life’s success. These changing conditions require new outcomes, such as critical thinking to be included as a focus of schooling.

**Research Problem**

The teaching and learning process is a two-way process or a give and take process which involves the teaching as the stimulus and learning as the response. The learner learns if he or she reacts to his or her environment (stimuli). Lardizabal et al. (1995) point out that what the student learns depends on what the teacher does. This means that the facilitator of learning is the teacher who provides the conditions for effective learning and who seeks to meet the needs, goals, and interest of the learners.

Cooperative learning is one of the better researched instructional strategies that exist and the results of this research indicate that cooperative learning produces cognitive, affective, and interpersonal benefits. According to Johnson and Johnson (1994) and Slavin (1995), when cooperative learning strategies are implemented effectively, these can improve students’ achievement more than traditional approaches to instruction, both on teacher-made and standardized tests. These improvements result from increased student motivation, greater time in task, and active involvement.

It is in this context that this study would like to study and discover the effectiveness of cooperative learning in developing critical thinking skills of students.

**Research Objectives**

Generally, this study aimed to identify the effectiveness of cooperative learning approach in developing the critical thinking skills of students. Specifically, it sought to answer the following questions:

1. How effective is cooperative learning approach in developing the critical thinking skills of students as compared to the traditional lecture discussion method?
2. What is the attitude of the students towards the two teaching methods used?

3. Is there a relationship between critical thinking skills and attitude towards lecture discussion method and cooperative learning approach?

**Research Methodology**

**Research Design**

The pseudo-experimental method utilizing the repeated measures design was used in the study. Two groups/sections were utilized as subjects of the study. It is repeated because each group was exposed to both teaching methods alternately. This alternate use of the method was repeated for six weeks.

**Respondents and Sampling Procedure**

The study involved two sections of the second year level of Andarayan National High School with a total of 115 students (56 students in section A and 59 students in section B). All of them were taken as subjects who were taught lessons using the lecture discussion method and cooperative learning approach alternately.

**Research Instruments**

The study made use of six pretests and six posttests as main instruments in the study. Also, the attitudinal inventory scale was used before and after the experimental period. These pretests and posttests were used to assess the critical thinking skills of students in organizing ideas, making inferences, giving interpretations, comparing and contrasting, and making judgments. The Attitudinal Inventory Scale was used to measure the attitude of the students towards lecture discussion method and cooperative learning approach.

**Collection of Data**

**Pre-Treatment Phase:** Within the duration of the study, the teacher prepared six pretests and six posttests to test the critical thinking skills of the subjects. Each of these pretests was administered weekly by the teacher before the discussion of the topic or selection.

**Treatment Phase:** The subjects were taught alternately using the lecture discussion method and cooperative learning approach for the duration of the study. The different cooperative learning approaches namely Think-Pair-Share, Round Robin Brainstorming and Numbered Heads were utilized in the cooperative group.

<table>
<thead>
<tr>
<th>Schedule of the two Approaches</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WEEK</strong></td>
</tr>
<tr>
<td>1st week</td>
</tr>
<tr>
<td>1st week</td>
</tr>
<tr>
<td>2nd week</td>
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<tr>
<td>2nd week</td>
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<td>3rd week</td>
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<td>4th week</td>
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<td>5th week</td>
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<tr>
<td>5th week</td>
</tr>
<tr>
<td>6th week</td>
</tr>
<tr>
<td>6th week</td>
</tr>
</tbody>
</table>

**Post Treatment Phase:** After the duration of the study, the results of the pretests and posttests on organizing ideas, making inferences, giving interpretations, comparing and contrasting and making judgments were evaluated, and compared based on the research problems. Also, the attitudinal inventory scale was administered before and after the experimental period.
Analysis of Data

The data were analyzed with the use of descriptive and inferential statistics. Descriptive statistics like frequency counts, percentages, means, standard deviation, and weighted mean were used to analyze data to answer descriptive questions. For the inferential questions, the t-test for independent groups was used to compare the pretest and posttest scores between the experimental and control groups. On the other hand, the t-test for dependent groups was used to assess the difference between the pre-and post-test scores of each group. To determine the effectiveness of the two methods, the gain scores between the posttest and pretest was used. The Pearson Product Moment Correlation was used to determine the relationship between the attitude of students toward English as a subject and the critical thinking skills of the students.

Result/Discussion

How effective is cooperative learning approach in developing the critical thinking skills of students as compared to the traditional lecture discussion method?

There is a significant improvement in the critical thinking skills of students taught with the use of lecture discussion method and cooperative learning approach. The mean gain scores of students taught with lecture discussion method and cooperative learning approach in the different critical thinking skills do not significantly differ as shown in their total mean gain scores.

Results show that in the first three weeks, the gain scores between the two groups do not significantly differ as shown in the computed t-values. However, the cooperative learning approach has significantly improved the critical thinking skills of the students as shown by the computed t-values on the fourth, fifth, and sixth weeks respectively.

What is the attitude of the students towards the two teaching methods used?

Though both approaches showed improvements in their attitude towards English as shown in their overall weighted mean in the pretest and in the posttest, it was found out that the attitude of students toward lecture discussion method is not significant while the attitude of students towards cooperative learning is significant as shown by the computed t-value. Moreover, it was found out that the cooperative learning attitude gain scores are higher than the lecture discussion method attitude gain scores.

Is there a relationship between critical thinking skills and attitude towards lecture discussion method and cooperative learning approach?

Lecture discussion method is not significantly related to critical thinking scores. On the other hand, cooperative learning approach is significantly related to critical thinking score.

Significance/Contribution of the Study

- Curriculum planners and administrators may use this study as a basis for curriculum revision emphasizing the development of critical thinking skills using cooperative learning strategies.
- Teachers may employ the different cooperative learning strategies to improve the teaching-learning process and the critical thinking skills of their students.
- Other researchers may also use this study as a reference in order to come up with other related studies. The strategies used in this study can be compared also to other strategies that could develop critical thinking skills.

Conclusions

Based on the findings, the following conclusions are drawn:

Cooperative learning is an effective alternative to the conventional method of developing critical thinking skills. The elements of this method help develop critical thinking skills and social skills of learners.
Sub-theme B: Methodologies and Strategies for Holistic and Enterprising Learning

Figures/Display Elements

### Figure 1. Summary Table on the Comparison of the Mean Gain Scores of Students Taught with Lecture Discussion Method and Cooperative Learning in the Different Critical Thinking Skills

<table>
<thead>
<tr>
<th>Skills</th>
<th>Mean Gain Scores</th>
<th>Computed t-value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LDM</td>
<td>CLA</td>
<td></td>
</tr>
<tr>
<td>Organizing Ideas</td>
<td>2.97</td>
<td>3.46</td>
<td>0.631ns</td>
</tr>
<tr>
<td>Making Inferences</td>
<td>3.04</td>
<td>3.17</td>
<td>0.218ns</td>
</tr>
<tr>
<td>Giving Interpretations</td>
<td>2.80</td>
<td>3.17</td>
<td>0.545ns</td>
</tr>
<tr>
<td>Comparing and Contrasting</td>
<td>2.32</td>
<td>2.50</td>
<td>0.248ns</td>
</tr>
<tr>
<td>Making Judgments</td>
<td>2.22</td>
<td>2.32</td>
<td>0.185ns</td>
</tr>
<tr>
<td>Total Scores</td>
<td>13.85</td>
<td>14.13</td>
<td>0.171ns</td>
</tr>
</tbody>
</table>

ns = not significant

** = significant at .01 level

### Figure 2. Summary Table on the Test of Comparison of the Attitude of Students towards the Use of Lecture Discussion Method and Cooperative Learning Approach

<table>
<thead>
<tr>
<th>Time</th>
<th>Mean</th>
<th>SD</th>
<th>Standard Error of Difference</th>
<th>Computed t-value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>42</td>
<td>3.6</td>
<td>0.479</td>
<td>1.742ns</td>
<td>0.084</td>
</tr>
<tr>
<td>Posttest</td>
<td>43</td>
<td>3.7</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>42</td>
<td>4.0</td>
<td>0.472</td>
<td>5.415**</td>
<td>0.000</td>
</tr>
<tr>
<td>Posttest</td>
<td>45</td>
<td>3.8</td>
<td>0.9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ns = not significant

** = significant at .01 level

### Figure 3. Comparison between the Mean Gain Attitude Scores of the Students in both Cooperative Learning Approach and Lecture Discussion Method

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean Gain Attitude Scores</th>
<th>Standard Deviation</th>
<th>Standard Error of Difference</th>
<th>Computed t-value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLA</td>
<td>2.56</td>
<td>5.06</td>
<td>0.616</td>
<td>2.794**</td>
<td>0.006</td>
</tr>
<tr>
<td>LDM</td>
<td>0.83</td>
<td>5.14</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** = significant at .01 level

### Figure 4. Relationship between the Attitude of Students and their Posttest Scores in the Cooperative Learning and Lecture Discussion Set-Up

<table>
<thead>
<tr>
<th>Variable</th>
<th>Correlation Coefficient</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude and Posttest Scores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LDM</td>
<td>0.004ns</td>
<td>0.966</td>
</tr>
<tr>
<td>CLA</td>
<td>0.189*</td>
<td>0.043</td>
</tr>
</tbody>
</table>

ns = not significant

* = significant at .05 level

** = significant at .01 level
References


How Does Inquiry-Based Instruction Affect Learning in a Secondary School Science Class?

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Abstract

This study used a quasi-experiment with pre-test-post-test design (quantitative) to compare students’ thinking skills achievement tests of students who practice structured-inquiry-laboratory practices (St-IQL) and students who only receive classroom teaching (CT) using two Biology chapters in secondary schools. Two classes of Form 4 students (n=64) from two public secondary mixed schools in Kuala Lumpur Malaysia were selected for the study. Higher- and lower-order thinking skills questionnaires (suggested by Bloom) were handed-out in the pre-test and post-test. The post-test was administered after both classes had done the treatments respectively (8 weeks) in order to evaluate the level of students’ thinking skills of Biology concepts. The students who were exposed to St-IQL treatment achieved higher post-test mean scores than those who were exposed to CT method. A small effect size (partial eta squared) of .23 suggests that 23% of the variance in the post-test scores were related to the differences in the instructional methods.

Keywords: Biology, constructivism, inquiry, laboratory, practical, science

Introduction

The Curriculum Development Centre under the Ministry of Education Malaysia (2014), emphasizes few instructional approaches in implementing higher order thinking skills (HOTS) pedagogy. Science can be attributed to constructivism and inquiry-based learning approaches that seem suited to students who desire to attain scientific skills, manipulative skills and higher order thinking skills (Liu & Lee, 2013). Despite the positive implications of these approaches, science teachers in Malaysia generally change their instructional styles from time to time from a teacher-centred to more hands-on student-centred, inquiry-based, problem-based learning and higher order thinking approach (Hiong & Osman, 2013; Lee & Kamarudin, 2014; Tan & Halili, 2015).

Confirmation, structured, guided and open inquiry approaches

Inquiry encourages learning in constructivism context, emphasizing that the learner construct their own ideas from what he has already known with the new knowledge or experiences acquired to form what is known as absolute higher order thinking i.e. ingenious learner (Hiong & Osman, 2013; National Research Council, 2000). The level of inquiry-based learning and teaching’s successful assimilation is dependent on how much a teacher holds the autonomy to conduct a lesson or how much freedom that a student have from his teacher to conduct his activities (National Research Council, 2000). There are four levels of inquiry, from the lowest to the highest:

1) **Confirmation Inquiry**- Students follow instructions where questions, procedures and solutions are all defined by their teacher alone (Trna, Trnova, & Sibor, 2012).

2) **Structured Inquiry**- Teacher poses questions to students with procedures, guiding students toward known outcomes. Nevertheless, students would have to proceed with hands-on activities, doing observation, data collecting and arranging results, making conclusions, drawing inferences and looking for alternatives (Zion & Mendelovici, 2012).
3) **Guided Inquiry**- Teacher still provides research questions and procedures and the students need to work as a team, collecting data, analysing them and developing solutions but the teacher and students are not well-adjusted to predict the outcomes (Zion, Cohen, & Amir, 2007b).

4) **Open Inquiry**- Students decide the problem, create the hypothesis, engage with decision making and develop their own research (Zion et al., 2007a). The open inquiry necessitates higher order thinking skills to be capable of independently forming questions, designing own experiment, expository and well-thought-out ability (Zion & Mendelovici, 2012).

**Learning Science**

Malaysia Education Blueprint urging that Science, Technology, Engineering and Mathematics (STEM) should be transmitted throughout our educational system. They emphasized that ‘A drop in interest in Science subjects may stunt efforts to improve technological innovations to make Malaysia a high income nation” (Malaysia Education Blueprint 2013 - 2025, 2013) (p.4-7). MOE’s continuous efforts in improving our quality of students’ outcomes toward STEM culminated in the Ministry and its team working hand in hand with Southeast Asian Ministers of Education Organisation Regional Centre for Education in Science and Mathematics (SEAMEO-RECSAM), to identify the obstacles faces among STEM educators regarding the content knowledge, curriculum and pedagogical skills in order to efficaciously formulate MOE’s new curriculum concepts and transmit them for practical application (*Malaysia Education Blueprint 2013 - 2025 (Preschool to Post-Secondary Education)*, 2013). The reintroduction of the Malaysian Certificate Education practical testing elements in national examinations after being postponed for 16 years is seen as one of the ambitious moves to upgrade our science education system. Conducting laboratory experiments facilitates students in accumulating scientific skills in a more proper environment or set-up, which cannot be achieved by theoretical learning alone, a salient point agreed by researchers from all around the world (Dika & Sylejmani, 2012; Pich-Otero & Molina-Ortiz, 1998).

**Purpose**

This study used a quasi-experiment with pre-test-post-test design to compare the students’ thinking skills achievement tests (quantitative) of students who practise structured-inquiry-laboratory practices (St-IQL) and students who only receive classroom teaching (CT). The research question is:

1. Is there a difference in thinking skills of biology concepts between St-IQL and CT groups?

**Method**

Two classes of Form 4 students (16-year-old) (n=64) from two mixed public secondary schools in Kuala Lumpur Malaysia were selected for the study. Both these classes were found to exhibit similar academic knowledge on the biology concepts having gone through a pre-test given to them before the commencement of the research. One class was selected as the experimental class to experience laboratory practices and classroom teaching (St-IQL) while the other was chosen as a control class restricted to classroom teaching without any laboratory practices (CT).

**Instruments**

Higher- and lower-order thinking skills questionnaires (quantitative) were handed-out in the pre-test and post-test. The questionnaires were adapted from past years’ Biology Paper 3 the Malaysian Certificate Education as suggested by Bloom taxonomy (1956). The pre-test was conducted to identify the students’ existing knowledge level of the two topics in their syllabus which are i. movement of substances across the plasma membrane and, ii. chemical composition of the cell (enzyme). Then the post-test was administered after 8 weeks treatments. The time required for completing the test ranged from 45-60 minutes.

As the questions were adapted from national past years’ questions, the content validity is deemed checked. Time inadequacy for the students to answer all the questions and ponder over probable confusing written instructions on the test papers was among the worrisome considerations that could complicate the pilot test. Notwithstanding, content validity was checked by two experts: a lecturer with a background in science education (Tunku Abdul Rahman University College) and a biology teacher (SMK Wangsa Maju Sec 2), both recording a teaching capacity spanning 5-10 years. The two experts checked the correspondence between the treatment and contents comprising of two parts: Part A consists of 28 opened-structured questions; Part B involves an essay. Quantitative assessments were done for the both questions. Another similar group of
secondary school biology students was chosen to undertake the pilot study using first draft of the test questions. They managed to answer all the test questions within 1 hour, and the written instructions were clear and comprehensible.

**Treatment**

The biology content and objectives of the St-IQL and CT were the same and were based on the curriculum by Curriculum Development Centre, Ministry of Education Malaysia (Curriculum Development Centre Ministry of Education Malaysia, 2005). Both instructions were bilingual (English and Bahasa Malaysia). Students of both classes were exposed to 8 weeks of teaching with four 35-minutes periods per week and conducted by their own respective subject teachers in schools.

**CT group**

The CT group students went through 8 weeks Biology lessons without laboratory practices but received practical teaching through explaining by their teacher during class, about 2 hours per week. They received direct learning using the question-answer method. The whole class (n= 28) was put together as a group: the teacher then transmitted her lecture notes through power point slides at the front. Upon discussion of the concepts aided by teacher’s explanation, questions were then directed to the students by the teacher.

**St-IQL group**

The students received the same content lesson as the CT group students with supplemented with laboratory practices. Four experiments (4 hrs) and 12hrs of lecture classes were conducted during the treatment. Total hours were same with the CT group. Four subtopics were chosen for their hands-on practical classes. Faced with limited equipment and time constraint and large number of students (n= 36), the teacher took charge of choosing the experiments’ procedures and hypotheses. The students, however, had a hand at picking their own team members and formed four persons in a group. Each group was only given one set of apparatus and chemical solutions during each practical.

**Results and Findings**

The results of the ANCOVA and description data analysis for post-test mean scores thinking skills between St-IQL and CT group are shown in Table 1.

<table>
<thead>
<tr>
<th>Class</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
<th>F</th>
<th>Eta-square</th>
</tr>
</thead>
<tbody>
<tr>
<td>St-IQL</td>
<td>23.31</td>
<td>7.910</td>
<td>36</td>
<td>18.063</td>
<td>.228</td>
</tr>
<tr>
<td>CT</td>
<td>16.96</td>
<td>3.697</td>
<td>28</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Table 1 indicates that there was a significant difference between the post-test mean scores of the students who were using St-IQL instructional method (M=23.31, SD= 7.91) and CT method (M=16.96, SD = 3.70); F (1,61) = 18.06, p=.00, p<.05, with partial eta square=.23. The students who were exposed to St-IQL treatment achieved higher post-test mean scores than those who were exposed to CT method.

**Discussion and Findings**

The advantage of acquiring and improving scientific skills through laboratory practicals is hardly surprising given the bigger opportunity these students have by not being restricted to theoretically learning in the class (Dika & Sylejmani, 2012) or at home, akin to daily life setting. It is believed that the constructivism-laboratory can help students in this study to apply almost all of the learning styles suggested in educational pedagogy (Abu-Asba, A, Azman, H, & Mustaffa, 2012).

Adding on to the literature on structured-inquiry-laboratory teaching, this study illustrates the effectiveness of St-IQL, in particular the thinking skills ability of the students. In the test of thinking skills, St-IQL students evidently fared better than CT students given the same content and overall teaching or learning period. Validated by these finding the St-IQL approach, overall, enhanced students’ learning outcomes in terms of
thinking skills and scientific skills. Coincidentally, these outcomes are supported by other previous findings (Hussain, Azeem, & Shakoor, 2011).

For this study, CT group used 100% of the time table period during the two months’ treatment to learn biology without hands-on activities while St-IQL group spent 25% of the same time allocation to execute hands-on activities on top receiving the same classroom teaching (75% of the time table period) as CT group. From the study, we can see a significant improvement in St-IQL students’ thinking skills test. This implied that time or quantity of teaching period was not a contributing factor in the study’s result, but rather the quality of the teaching approach is.

Some of the researches substantiated that by using the same amount of teaching period to conduct two different instructional approaches, for same contents, inquiry-based learning approach would have higher chances to produce significant better outcomes than control groups (Hussain et al., 2011). Indeed, there was also a rare case where inquiry-based learning was allocated a longer time but no compelling difference was found in students’ conceptual understanding compared to the control (Maria et al., 2013). Again, the quality of the instructional approach played a pivotal role in this study.

As prompted by this study, St-IQL students spent 16 hours on learning biology using the inquiry-based approach for two months, resulting in better outcomes than the classroom teaching group. The test’s effect size of test was .23 for the post-test. Based on Avsec & Kocijancic (2014)’s research (excluding all other factors while solely focusing on the period usage and effect size with similar cases), the participants used 15 hours on inquiry-based learning and the results showed that they had gained .37 effect size in knowledge development, .29 in research skills and problem solving abilities and .16 for critical thinking and decision-making ability.

Another case study taken from Hughes & Ellefson (2013)’s research showed that their subjects who underwent 5 hours of learning the inquiry-based learning (IBL) approach had gained .34 effect size of biology grade scores. If a comparison is to be made on all these studies to see the relationship between the teaching hours and the effect size with our study, by using simple mathematic calculation, the minimum teaching hours a inquiry-based learning approach student needed to achieve .80 effect size as suggested by Cohen (Pallant, 2011) would be 53.3 hours as shown in Table 2.

Table 2 Comparison of teaching hours, effect size and total hour needed to achieve .80 effect size

<table>
<thead>
<tr>
<th>Research</th>
<th>Hours used for inquiry-based learning</th>
<th>Effect size obtained</th>
<th>Mean effect size per hour</th>
<th>Total hour needed to achieve .80 effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avsec &amp; Kocijancic (2014)</td>
<td>15</td>
<td>.37</td>
<td>.025</td>
<td>32.0</td>
</tr>
<tr>
<td>Hughes &amp; Ellefson (2013)</td>
<td>5</td>
<td>.16</td>
<td>.011</td>
<td>72.7</td>
</tr>
<tr>
<td>This study</td>
<td>16</td>
<td>.23</td>
<td>.015</td>
<td>53.3</td>
</tr>
</tbody>
</table>

The result in the table indicated that the effect size of the IBL approach for this study is still nowhere near the large effect size of .80 in the other two studies, which took fewer hours to accomplish. The discrepancy in teaching hours in the studies conducted by Avsec & Kocijancic (2014) and Hughes & Ellefson (2013) respectively may have been the result of using different types of IBL approaches. Guided-IBL were used by them as an instructional approach which can be considered as a higher level inquiry-based learning method than what this study (Structured-IBL) is trying to achieve (Zion & Mendelovici, 2012). Some insights can be gleaned by comparing different levels of inquiry from a few studies among which are the higher the level of IBL approach used, the higher the chances of getting better outcome in teaching (Ketpichainarong, Panijpan, & Ruenwongsa, 2010).
Conclusions

It is safe to say that students would perform better academically if more teachers are willing to take up the challenge of providing IBL to their students in a protected learning environment such as the school. Undeniable this construct is critical towards advancing student’s thinking skills, playing an important role in the inquiry process. Together with a constructivist environment, there should be no objection to using IBL as an instructional tool to develop students’ scientific skills in the long run (Zion & Mendelovici, 2012). In this context, the results of this research may open a window for educators toward understanding the basic core of structured inquiry-based learning.

References

Effectiveness of Scientific Visualisations in Chemistry Education

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Abstract

With the booming of the educational visualisation tools, it is a popular trend on the use of visualisation in the classroom, especially learning the science subjects. Visualisation helps the students in generate and imagine the concept in molecular scale. There is no doubt about the interest arise because of the visualisation tools. However, it is intriguing in terms of learning and understanding the concept effectively with the aid of visualisation. Findings revealed that there was a slightly better understanding on certain chemistry concepts by using the visualisation in the classroom. Besides that, most of the students had positive feedback on learning a concept through visualisation. They preferred an effective visualisation, which can deliver the key concept in an easier and quicker way.

Keywords: scientific visualisation; chemistry; science

Introduction

In Malaysia, most of the schools, colleges and universities have well-equipped ICT facilities in the classrooms, which have risen the idea of teaching with the aid of visualisation. Visualisation can be pictures, three-dimensional models, geometrical illustrations, schematic diagrams, computer generated displays, simulation, animation, video and so on (Vavra, 2011). There is a consensus of opinion among the educators that visualisation is an effective teaching tool. Current application of visualisations can be found in almost all teaching subjects, especially the science subjects. Some types of visualisation can enhance and replace verbal or textual explanation of particular scientific concepts. Therefore, the development of good quality visualisation is getting important in educational community.

Chemistry is one of the science subjects, which the application of visualisation is considering wide. To learn chemistry effectively, it is important to have a mental models of processes at the molecular scale (Gilbert,2005; Chittleborough and Treagust, 2007). Many students find this challenging as they can’t relate between molecular scale and the observed macroscopic phenomena.

Visualisation based approaches is useful because they may assist students in developing appropriate mental models at the molecular level. An effective visualisation can reduce how much students need to remember by making information explicit (Wu,2004).

There are many studies related to teaching with visualisation in different fields. A number of studies have shown that visualisation can be beneficial to science-based learning when used, and it can be a good way for schools to incorporate technology (Dunsworth, Atkinson,2007). There is significant difference in learning gain with the use of visualisation. Clark and Meyer (2003) suggested the use of animation with narration produce significant improvement in understanding the complex graphic. It’s tempting to use an eye-catching mix of animations, sounds, audio, and text to convey the contents.

According to an article written by Tom (2016), visualisation is useful for teaching chemistry in a way that forces students to engage with the underlying concepts. Hybridisation is one of the difficult concept in Chemistry for students to visualise. The flash animation displayed the formation of hybrid from orbitals, which helped the students in imaging and learning on hybridization. Assessment of conceptual understanding has reflected the use of visualisations in the learning of chemistry. Some scientific visualizations and animations can be complex and difficult to understand. Hence, multidisciplinary teams are now studying how the use of visualisation techniques in the teaching and learning of chemistry can be optimized.
Some studies revealed that learning with visualisation does not give better performance in the test score. Geelan (2012) studied the effectiveness of visualisation in Chemistry and Physics class and he found that there is no significant difference for the group of students learning with and without visualisation. In addition, there are few studies suggest that students using animation programs do not show advancement in cognitive learning (Kelly & Jones, 2015). The study stated that the characteristics and learning style of the students decided the effectiveness of visualisation in learning the concept of chemistry. Visual-spatial learner will prefer visualisation-based approaches to learn and understand the concept.

Some educators have reservations on using visualisation in the classroom. One main concern is selecting suitable visualisation for specific concept to learn. (Donovan, Hartley & Strudler, 2007). The source of visualisation on the net is wide. It’s time consuming to create an effective visualisation for teaching. A suitable, correct visualisation can avoid misconception. Any misconceptions that appeared after viewing animations resulted from the retention of previous misconceptions.

It is clear that scientific visualisation will never fully substitute other chemistry pedagogy. However, with the growing number of scientific visualisation available on the net, we can see the significant important of visualisation in learning chemistry. Limited research has been published for the effectiveness of scientific visualisation in term of test score. The results of this paper could give new insight into visualisation in the school, college and university.

Research Problem

Some studies found that visualisation increased student engagement and interest level, but questions linger whether the visualisation is effective on learning and understanding, and perform well in the test. (Korakakis, 2009; Geelan, 2012). Although students’ interest and attraction increased in response to visualisation, their understanding of the concept did not significantly improve. There is less evidence in educational effectiveness in terms of learning and developing a new concept with scientific visualisation. This study looks at how the visualisation can be useful for students in learning and understanding a totally new concept on a specific Chemistry topic for Pre-University students. The study will compare students’ conceptual learning with selected scientific visualisation and without the visualisation tool. In addition, this study also looks at how students’ thought and gain from learning with the aid of visualisation.

Objectives of the Study

The objective of the study is to evaluate the effect of scientific visualisation tool for Pre-University students in learning and understanding specific concept in chemistry. Besides that, it looks at students’ perceptions on the role of visualisation in helping them learning chemistry in College.

Research Methodology

The research was conducted on a Cambridge GCE A-levels Programme chemistry lecture, which divided into two groups. Each group has 20 to 25 students from Sunway College Johor Bahru. The students will learn a concept with visualisation and another concept without visualisation. Each group of students served as the control in one concept, and experimental in another concept. The group of students were randomly in terms of background, gender and academic ability.

Specific concepts that appear in the Cambridge GCE A-levels Chemistry syllabus were chosen for the study. The concepts chosen were Le Chatelier’s Principle and hybridization. The flash animations were chosen from the existing resources that were available on the website. The link to the flash animation used is http://www.mhhe.com/physsci/chemistry/essentialchemistry/flash/flash.mhtml. For the experimental group of students, visualisation displayed in the beginning of a lecture and classroom discussion was done after the visualisation.

For the control group without using the visualisation, the lecturer directed the explanation as usual in front of the classroom and discussion was done after the explanation.

Assessments are done to evaluate the effectiveness of learning with and without visualisation tool. The same pre- and post-lecture test are given to all students involved in the study before and after the lecture. The test consists of 10 questions to assess the understanding of basic concepts introduced in the lecture, which included
both direct and extension questions. Average score of test of each group in each concept learned was calculated and compiled in Figure 1. As the average scores are based on small size in both group, the observations in the classroom were used to demonstrate certain effectiveness of students in learning and understanding.

In the end of the study, feedbacks from the students were collected in the form of questionnaire to know the perception of students in learning with visualisation. Students were required to answer some open-ended questions which related to their learning experiences with visualisation in the lecture.

Results /Discussions

The average scores of pre- and post-lecture test for two groups of students are compared and compiled in Figure 1. The data show a significant increase in pre- and post-test scores after the new concept was learned. There is a slightly bigger increment in pre- and post-test score for the group of student learning with visualisation on the concept of Le Chatelier’s Principle. The increment is higher for the group of student learning with visualisation on hybridization. This result shows that visualisation gives a better understanding on the concept of hybridization. The answers to questions given by the students that learn with visualisation were more detailed and delivered the key concept. Comparison of the increment average score revealed that the visualisation learning approach gives a quicker understanding in both chemistry concepts, especially on hybridization.

Sample t-test were conducted for the post-lecture test score on both concepts chosen. The level of significance was set at 0.05. For Le Chatelier’s Principle, the result showed that there is no significant difference between learning with and without visualisation (t=0.75, p=0.46). This indicates both groups are about the same levels in terms of their understanding in Le Chatelier’s Principle concept. However, for hybridisation, t-test showed that there is a significant difference (t=2.52, p=0.015). Overall, learning with or without visualisation yielded significant learning differences for the concept of hybridisation, but no significant difference in learning Le Chatelier’s Principle.

As we compare the increment average score of the group without visualization, students developed the concepts well too. The more academic capable students in the group can understand new concepts without visualisation. However, some phenomena can be observed from the group without visualisation. Lecturer spent more time to explain a concept, while students will take time to understand from the explanation. For the group of learning with visualisation, the time taken to make students understand the concept is relatively shorter than the normal explanation by the lecturer. After visualisation, students were involved in a discussion on what they see and understand from the visualisation shown. Visualisation has effectively stimulated student’s interest in understanding the concept deeper, as they will try to make a connection on the visualisation and the concept learned.

Based on the student’s responses, most of them supported the use of visualisation in helping them to learn the chemistry concepts. There is general agreement as visualisation had stimulated their interest in studying the new concept and it is able to make the students focus in the classroom. Some students are reserved on the use of visualisation in learning chemistry. They believed that not all the topics are suitable and effective to learn with visualisation. Part of the students agreed as explanation should be given by the lecturer before a visualisation displayed. Some less-able students did misinterpret by the visualisation, as they are still developing the understanding of the concepts. Most of the students believed the choice of visualisation is important as effective visualisation delivered the key concept for students to understand a new concept in a faster and easier way.

Contributions of the study

Based on the result from this study, it showed a significant important to use scientific visualisation for teaching in chemistry. This finding may be helpful for those who searching alternative approaches in teaching. However, before a visualisation displayed in a lecture, students should have some background knowledge and skills to use and link the visualisation effectively. Visualisation based approaches are proven to be beneficial to both educators and students. However, the way of visualisation is presented in a lesson is another interesting thing to discover.

From this study, the choice of scientific visualisation is crucial; as ineffective visualisation may lead to confusion of the concept. Short and simple visualisation can depict larger concepts broken down into smaller parts. Therefore, development of effective and related scientific visualisation is essential among the educational community, if the visualisation is implemented in a lesson.
Conclusions

Overall, the findings of this study shown that visualisation plays the role to a certain extent in learning and understanding on chemistry concepts chosen. Students appreciate and value the use of scientific visualisation in learning chemistry. The conclusion of this study is helpful for lecturers and teachers who concerned about the effectiveness in learning for students with and without visualisation in a lesson.

There are other factors which influence the effectiveness of visualisation in learning. The choice of visualisation used in the lecture is important in understanding the concepts. Future research is required in order to find a suitable visualisation to use in lectures on various types of learner in a group. Besides that, the finding can be more dependable, if the number of students in the study and duration of observation increased, and more concept is selected for study.

Figures/Display Elements

Figure 1: Average score of pre- and post-lecture test for two different chemistry concepts.

References


Exploring the Impact of International Student Mobility on Cross-Cultural Learning Adaptation

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Abstract

Recent developments in globalisation of higher education encourage increased student mobility. This talk examines the extent to which international student mobility exerts an impact on cross cultural learning adaptation of the students in new learning environments. Informed by an innovative, cross-faculty study involving international academics from Business and Design, the learning experiences of students from China studying Business in the UK and students from the UK studying Design in China are explored. Using Kolb’s theory of experiential learning to frame the study, and corresponding to the key features of the learning in cross-cultural conceptualisation proposed by Cortazzi and Jin, seven themes of adaptation of students’ learning styles are identified including students’ perceptions and response to good teaching, good learning, peers and assessment. Each plays an important role in facilitating effective engagement with learning in the new learning environment. Guidelines for systematic, pre-mobility, intercultural skills development are suggested to ensure maximum benefits from study abroad. The talk informs the design of student mobility programmes with aspects of intercultural empathy in the context of internationalised higher education.

Keywords: Internationalization, student mobility, cross-cultural learning adaptation

Introduction

The context for this paper is an increased internationalisation of learning and teaching in Higher Education (HE) worldwide (Knight 2006; Caruana & Spurling, 2007) and specifically the ambition to internationalise student experience (Hyland et al., 2008). The specific interest is ‘internationalisation’ from the students’ perspective as it focuses on ‘academic learning that blends the concepts of self, strange, foreign and otherness’ (Teekens, 2006, p. 17). This view of internationalisation is also congruent with the perspectives of Appadurai (2001), Haigh (2009) and Sanderson (2011) who foreground the value of personal awareness in intercultural encounters in HE. The interest for this paper, within this context, is to examine the complexities underpinning the concept of culture of learning in student mobility through a non-essentialist lens. Exploring the rich, individual student perspectives, the objectives are to explore how students can benefit from cultural diversity through mobility and how this impacts their cross-cultural adaptation, a key contributor to the development of an intercultural capacity.

Research Problem

In the context of an increased student mobility and student exchanges, currently promoted by the universities, students are encouraged to experience different cultures in order to reflect on their own and to develop a sound understanding of other cultures of learning (Killick, 2011). However, the differences between/among students’ own and host cultures of learning, and particularly, students’ misconceptions about the host culture of learning, can be problematic for students studying abroad, as well as for the HE faculty and staff associated with both the home and host universities. This study attempts to address these mismatches in the expectations or perspectives of students and inform program directors involved in student mobility programs. Furthermore, it is the dynamic changes in our students’ learning experiences, rather than cultural traits frozen in time, that inspired our research.
Objectives of the Study

The study reported here goes beyond existing understandings of ‘cultures of learning’ linked to China and the UK by opening perspectives on individual experiences to form insights that move from an essentialist view. The intention is to identify areas of support that universities can provide for students participating in such internationalised education. With aspects of intercultural empathy and an inclusive, flexible learning ethos, it could also inform initiatives for increased student mobility at university and beyond.

Using individual experiences rather than a large quantitative sample, the complexities and richness of ‘culture of learning’ are unpacked and explored with a specific focus on students’ evolving perceptions of own and host learning cultures. Specifically, the researchers were interested in the students’ perspectives of the foreign culture of learning, how the students’ perspectives about the foreign culture of learning are different from their home culture of learning and how the students’ perspectives of the foreign culture of learning change over time.

Research Methodology

Participants

Two different groups of exchange students were identified as research subjects: nine Chinese students coming to study in the UK from China, and nine UK students leaving the UK to study in China. The students involved in this study came from a diverse range of ethnic, cultural and economic backgrounds. The UK students included Scottish, Anglo-Chinese, Russian and Kurdish backgrounds. Similarly, Chinese students who took part in the study came from different cities in China, representing a spread of backgrounds. As mentioned above, none of the groups of students were given specific pre-departure training about the foreign culture of learning.

Data Collection Instruments

Following university ethical procedures students were asked in advance to give their informed consent to participate in the study. Qualitative data was generated through in-depth interviews at the start and at the end of their study abroad experience, informed by students’ reflective journals, which were undertaken longitudinally in parallel with the students’ study in the host countries for four months. The questions for the interviews at the start and the end of the study abroad can be found in the Appendix. Reflective journals are widely used to reflect on the ‘encounters’ or ‘moments’ or ‘experiences’, by briefly recording learning events and then reflect on the meaning of the experience for their own development and learning (Loo & Thorpe, 2002; Wagner, 2006). In-depth, semi-structured interviews taking between 30-40 minutes, were conducted with the students before their departure from the UK and at the end of the exchange in China. The Chinese students were interviewed at the start and end of their exchange in the UK. The students kept reflective learning journals. The participants were asked to use the journals whenever they felt inspired to, there were no fixed writing periods agreed to ensure the participant-led approach. There were no specific prompts provided what to record although the participants were encouraged to reflect on the ‘encounters’ or ‘moments’ or ‘experiences’ i.e., briefly record them and then reflect on the meaning of the experience for their own development/journey/learning. At the end of keeping their journals, students are asked to review themselves what they have gathered in their journals, and write a ‘final journal reflection’, summarising main points and highlights.

Data Analysis

Content analysis followed by thematic sampling was conducted on the data from the interviews and reflective journals (Ortlipp, 2008). This triangulation of data collection ensured that rich data was obtained and the varied sources of data provided an opportunity to look at the experience from varied angles, both researcher led and student led (Flick, 2014). This study’s non-essentialist approach and focus on individual, dynamic and evolving perceptions, sees it reporting responses from relatively small amount of responses. Nine Chinese participants are coded 1A-I and nine UK participants are coded 2A-I. This offers an opportunity for an in-depth exploration of experiences as seen through students’ eyes, shining a new light on the complexities involved in student mobility regardless of essentialist national boundaries.
Results /Discussions

The results are grouped in seven distinct themes which arise from the process of thematic analysis of the interview transcripts and the analysis of journals: Expectations Of Good Teaching; Expectations About The Learning Process; Expectations About How To Interact With Lecturers; Perceptions Of Good Learning; Role Of Peers In The Learning Process; Assessment And Learning; and Preferred Form Of Assessment.

The themes correspond to the key features of the culture of learning conceptualisation proposed by Cortazzi and Jin (1997) and the results grouped according to the seven themes are discussed below. The presentation of the results strives to navigate the reader through the trends arrived from the data, emphasising the most common characteristics for the theme and how the students’ perceptions changed over time. However, references to ‘UK participants’ and ‘Chinese participants’ are made for clarity and to explore the distinctions between home and host culture for these two groups of students.

The present study offers a unique insight into students’ evolving perceptions of own and host culture of learning. It seems that students’ perceptions of ‘culture of learning’ may be fluid rather than fixed, nationally bound objects. Their perceptions also seem to evolve in response to the change of the learning context which seems to be a stimuli for students to explore their own culture of learning and their host culture of learning. Furthermore, the boundary what is traditionally perceived as the ‘Chinese culture of learning’ and the ‘UK culture of learning’ seems more blurred than being clear-cut. Both student groups seem to develop similar perceptions to a certain extent through shared experiences of cultures of learning.

Contributions of the study

This paper seeks to open and inform the debate to equip HE educators in a rapidly changing globalised society, especially the developments in encouraging global student mobility, and how educators can prepare for this new and growing area of international education. The emerging results point to the importance of study abroad as a key shaping experience for the students’ evolving awareness of their own culture of learning and the hosts’, hence developing an intercultural dimension to the overall study experience. This essential understanding of own and other cultures is one of the key features of a global citizen (Hyland et al 2008).

Conclusions

For education providers wishing to increase student mobility, it seems necessary to ensure an effective preparation for students involved, including raising students’ awareness of their own culture of learning and preparing students for the intercultural encounters prior to engaging in student mobility. This can be achieved by asking the returning exchange students to present a short video/slideshow describing their experiences studying and living on exchange to prospective exchange students. Another way institutions can prepare students would be through a buddy up scheme with returning exchange students. Finally, students should be equipped with sound independent study skills (Hyland et al., 2008).

References


Intercultural Perspectives in Financial Trading and Investments using Simulation Based Learning

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Abstract
This study uses a simulation based learning platform in evaluating intercultural perspectives amongst a group of multicultural students in the UK and the Netherlands as part of an Online International Learning project. Using Dynamically Linked Simulations Based learning, we demonstrate that simulation based learning can be a useful tool in uncovering intercultural competencies in students. Our analysis also takes into account several fundamental pedagogical models focusing on intercultural competence. The financial trading platform used for the simulation based learning activities presents an opportunity for us to capture students’ intercultural competencies using the key research questions of the study. These explore if students are able to demonstrate awareness of their own position and cultural perspectives on financial trading and investment decisions following cross-border interactions, and also if they are able to demonstrate an understanding of underlying factors that inform trading and investment decisions of people from other cultural backgrounds and countries. Overall our results provide evidence that as much as 81.8% of students agreed that such simulation based financial trading activity made them more aware of some underlying cultural factors that drove investment and trading decisions of their counterparts from other cultures, and all of the students agreed they had more cultural self-awareness of their own financial trading and investment decisions. Our results provide strong evidence on the need for increased intercultural engagement amongst not just finance students but across the broader range of students in Higher Education.

Introduction
Internationalisation has been at the forefront of the strategic aims of most higher education institutions in recent times as these institutions seek to improve competence amongst their students. Several scholars have defined internationalisation in several ways but a common theme of these definitions is that it involves a series of policies and practices undertaken by academic institutions and related individuals to cope with the global academic environment (Altbach and Knight, 2007). Although, there is a general consensus on the need for internationalisation in higher education institutions given the increasingly global world that we live in, there still remains the question of how exactly to capture the competencies that internationalisation seeks to enhance in students. Generally, one of the outcomes of a successful internationalisation strategy is assessing the level of intercultural competence amongst students. While studies such as Deardorff and Darla (2006) have sought to develop techniques for assessing intercultural competence as an outcome of internalisation using various models, there is still no consensus as what assessment model effectively captures intercultural competence.

In this study, we propose a method of assessing intercultural competence using simulation based learning. We argue that by putting students in a simulated real life work scenario, we are able to better capture work based intercultural competences which are vital for eventual workplace skills. Using an Online International Learning (OIL) project, our study seeks to address our main research question which is: To what extent can simulation based learning capture international competences amongst students? Our study uses a group of second year Finance students from Coventry University and Saxion University in Netherlands for the project as described in the methods section below.

From the ensuing OIL project, the study seeks to achieve the following intercultural learning outcomes between the two groups of students:
• First, students should be able to demonstrate awareness of their own position and perspective on ‘risk-taking’ and attitudes toward risk following cross-border interactions. This includes recognising new perspectives about their own investment/trading rules and biases that ultimately inform and impact their decision-making/strategies.

• Second, students should be able to demonstrate understanding of underlying factors that inform trading and investment decisions of people from different backgrounds/countries. These include economic, political, communication styles, beliefs, history, values and practices – and how these motivations manifest in decision-making behaviour, negotiation and decisions.

• Third, students should be able to demonstrate the skills necessary for engaging in trading and investment decisions within globally-dispersed cross-cultural teams. This includes intellectual and emotional dimensions, awareness of verbal and non-verbal communication, managing (in)directness in response/critique, speed of decision-making and understanding perception and differences in ‘assigned’ roles and responsibilities.

Most of the previous works done on assessing intercultural competence have tended to focus on language competencies or cross-cultural behavioural competencies (see Sinicrope et al 2007 for a survey). To the best of our knowledge, our study is the first to focus on subject specific on-the-job intercultural competencies which are best captured using simulation based exercises.

Related Literature

The key literature explored in our research focuses mainly on understanding the key dimensions on intercultural competence. Fantini 2006 defines intercultural competence as “a complex set of abilities needed to perform effectively and appropriately when interacting with others who are linguistically and culturally different from oneself”. This definition implies intercultural competence as a set of tools needed in a globally diverse environment. Specifically, Sinicrope et al (2007) argue that these tools needed to demonstrate intercultural competence mainly fall into one of three categories namely attitude, knowledge and skills. They define attitude as the affective perspective, knowledge as the cognitive perspective and skills as the behavioural perspective needed to excel in an intercultural environment.

Earlier studies such as Ruben (1976) have sought to conceptualise intercultural competence by highlighting seven dimensions of intercultural competence. These dimensions include the display of respect, interaction posture, orientation to knowledge, empathy, self-oriented role behaviour, interaction management and Tolerance. They argue that interculturally competent individuals will exhibit some or all of these dimensions. More recent studies such as Risager (2007) developed models such as the European Multidimensional Models of Intercultural Competence which also refer to dimensions such as attitude, knowledge, skills of interpreting and relating, skills of discovery and interaction and critical cultural awareness as key aspects of intercultural competence.

Hammer, Bennet and Wiseman (2003) sought to identify the difference between intercultural competence and intercultural sensitivity. They highlight that intercultural competence is the “the ability to think and act in interculturally appropriate ways” whilst intercultural sensitivity has more to do with “the ability to discriminate and experience relevant cultural differences”. Bennett (1993)’s Developmental Model of Intercultural Sensitivity (DMIS) also highlights the role of intercultural sensitivity as a means to achieving intercultural competence.

Although these models and approaches recognise the existence of differing cultures as a means of understanding intercultural competence, some studies such as Arasaratnam and Doerfel (2005) propose a Culture-Generic Approach to Intercultural Competence. Their argument is that as the world converges as a result of globalisation, cultures should also converge and differences between cultures should gradually reduce. Overall, a mix of these approaches will generally capture a broad understanding of intercultural competence.
Method and Activities

As previously highlighted, the project was carried out between 45 second year Finance students at Coventry University and Saxion University Students, Netherlands. The project used several simulated trading activities consisting of 5 trading days with 10 minute days run simultaneously. Students were expected to interact with each other across the locations prior to trading activities via their investment and strategy discussions (e.g. diversification, asset screening strategies). Interactions between the students are expected to help raise awareness of international and intercultural perspectives in financing and investment decisions.

At the onset of the project, students were split into pairs which consist of one Coventry University student and one Saxion University student and both would work as a group to tackle trading activities in the simulated market environment. Of the two members, one student acted as an Investment Analyst who was responsible for analysing market information whilst the other acted as a Trader responsible for making the traded based on the recommendations of the Investment Analyst. The game therefore required constant interaction between the two members of the team as they tried to make their financial trading decisions. Interaction during the game was done via Skype, mobile phone texting applications and email. At the end of the virtual trading week, students were then required to produce a reflective report on their interactions and strategies as well as fill a questionnaire as to their performance.

Results and Findings

Our questionnaire at the end of the activities sought to capture how well students understood the activity as well as if indeed our learning objectives set out above have been achieved. Ultimately, our questionnaires seek to capture how well the students were able to achieve the task set out whilst having to deal with cross cultural differences.

Figures 1 – 4 below show the responses of students to the questionnaires.
When asked if they understood the aims of intercultural competence and participating in the project, all the students generally agreed they did. Although majority of the student associated with learning outcomes 1 and 2 which captured cultural self-awareness and cross cultural awareness respectively, learning outcome 3 which captured skills seemed more difficult for students to demonstrate. We find that the projects captured students’ cultural self-awareness the most with 100% of students agreeing to some extent that they were culturally self-aware, although this figure fell to 81.8% when we considered cross cultural awareness of their colleagues from another country. Our main findings however is that many more students found it difficult to implement their trading strategies mainly due to cultural barriers. Most of the limitations to implementing their strategy stated communication differences in cultures as the greatest barrier to implementing their strategies. Non-verbal communication particularly seemed to be a key issue highlighted by the participants to cause significant cultural differences in communication. These findings on the majority of students struggling to implement their strategy may suggest a need for greater intercultural competence among these students.

References


Developing a Framework for Effective Postgraduate Supervision

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Abstract

all levels including postgraduate study. In Malaysia, an initiative referred to as MyBrain15 under the National Higher Education Strategic Plan (NHESP) aims to produce 60,000 postgraduate doctoral graduates by 2023. Despite the significant push by the government for more knowledge and innovative workforce, the success rate of MyBrain15 leaves much to be desired. One of the reasons cited for the high attrition and low completion rates among research postgraduates around the globe has been postgraduate supervision. Therefore, this study aimed to develop a framework for effective postgraduate supervision. The descriptive study involved 209 postgraduate students and 120 supervisors from two local universities in Malaysia. Data were collected via two questionnaires and semi-structured interviews. Based on results obtained from the study, this paper will put forward a framework for holistic postgraduate supervision.

Keywords: holistic education, postgraduate study, supervision, supervisors, supervisory process.

Introduction

The age of information witnessed the democratization and massification of education at all levels including postgraduate education. Consequently, postgraduate supervision has been brought to the forefront as it has been viewed not only as an important means for creating new knowledge but also for many supervisors, it has become an increasingly stressful experience. Today, postgraduate supervision is widely acknowledged as a ‘professional practice’ and has emerged as a well-explored and evolving field of study in the West but it is still very unexplored terrain in the East, especially in a developing country like Malaysia.

To date, no encompassing definition has been reached for postgraduate research supervision but nevertheless, similarities do exist between definitions. For instance, Laske and Zuber-Skerritt (1996) define research supervision as a process of fostering and enhancing learning, research and communication at the most level of teaching in the educational system whilst Sidhu et al. (2015) reiterate that postgraduate supervision is a negotiated and facilitative relationship between a supervisor and a supervisee in a complex process where the supervisor needs to guide, coach and mentor the students towards the successful completion of a research project or thesis. As the quest for quality education pushes boundaries across the world, institutions of higher learning (IHL hereafter) are compelled to produce high quality graduates that can contribute to new research and innovative ideas for publication in high impact journals. Therefore, there is a critical call for IHL to provide quality research supervision so that students can complete their study successfully within the given time frames. This can be aided through supervision models that can help charter success for all parties in postgraduate study.

Grant and Graham (1999) attest that there are two main ideal-type models of supervision operating in contemporary practice. One emerges from the liberal humanist view of social relations between an autonomous supervisor and a supervisee which is largely a matter of technical rationality with the goal to help train the student in practices of research. Such a view is also taken by Gurr (2006) who views supervision as a process to raise awareness and a form of dialogue and shared understanding between the two parties. The other model suggests supervision is a negotiated process which according to Grant and Graham (1999) is less universal and less predictable but nevertheless more responsive to student needs as supervision is often plagued with notions of uncertainty, uniqueness and sometimes conflict and power relations. The success of this model depends on good relationship and communication between the two parties. Sidhu et al. (2015) however take a holistic approach towards supervision and state that supervision is often viewed as a negotiated and facilitative process...
which hinges on the tenets of holistic education of connectedness, wholeness and being. They highlight that ‘connectedness’ as perceived by Jarvis and Parker (2006), includes elements such as interdependence, interrelationship, participatory and non-linearity and this refers to the interdependence among the student, supervisor and the institution. The concept of ‘wholeness’ is aligned to the rationale that whole systems have emergent properties that cannot be broken down whilst the concept of ‘being’ is about the student-supervisor relations as being one where both parties can fully experience the process of supervision including the fully human aspects and domains, i.e. the cognitive, emotional, physical and spiritual intelligences in a balanced and integrated manner. Hence, this holistic approach to supervision stresses the importance and interconnectedness of the student, supervisor and the institution to work collaboratively to complete the research project so that success can be achieved by all parties concerned.

Research Problem

In today’s competitive global economies, there is a need for countries to develop a critical pool of knowledgeable and innovative workforce. Realizing this need, the Malaysian Ministry of Higher Education launched ‘MyBrain15’ which aims to produce 60,000 Malaysian PhD holders by 2023. Sidhu et al. (2014) and Cassuto (2013) note that while postgraduate numbers have increased over the years, approximately 50 to 60 percent of students often leave without completing their doctoral study. Among many of the factors cited, postgraduate supervision is often cited for high attrition and low-completion rates. Therefore, there is a critical need to investigate and develop a framework for effective postgraduate supervision.

Objectives of the Study

The main objective of this study was to develop a framework for effective postgraduate supervision. Specifically, it aimed to look into the perspectives of both postgraduate students and supervisors concerning effective postgraduate supervision with regards to the three main key players in the supervision process i.e. the postgraduate students (PG Students hereafter), the supervisors and the institution. The research objectives focused on the roles and responsibilities of students and supervisors, supervisory processes, studentsupervisor relationship, student readiness and competences for postgraduate study, institution support and challenges faced by both supervisors and supervisors.

Research Methodology

This study employed a descriptive research design with a mixed methods approach which involved both quantitative and qualitative data collection methods. Quantitative data were obtained from two sets of questionnaires and involved 209 PG students and 120 supervisors who were randomly selected from two local public universities in Malaysia. The survey instrument investigated a number of aspects such as student and supervisors’ roles and responsibilities, supervisory practices, institutional support, student-supervisor relationships, student readiness for PG study and challenges faced by both groups. The questionnaires were based on a 5-point Likert scale. Qualitative data were obtained from semi-structured interviews with 12 students and 6 supervisors. The quantitative analysis was conducted using the SPSS version 20 and involved the use of descriptive and inferential statistics such as t-tests and ANOVA. Finally qualitative data were transcribed and analyzed both deductively and inductively.

Results /Discussions

The following sections will report the findings obtained from the instruments used to examine the perspectives of both PG Students and supervisors on various aspects of postgraduate supervision.

Roles and Responsibilities:

The results showed that both supervisors (M=4.92, SD=.543) and students (M=4.87, SD=.279) acknowledged the need for clear guidelines on the roles and responsibilities of both parties. A large majority of the students felt that supervisors were generally aware of their roles and felt that supervisors should be good role models in terms of research and publication (M=3.59, SD=.581), possess good communication skills (M=3.56, SD=.530), provide timely and constructive feedback (M=3.50, SD=.562), advise candidates on research ethics and instil motivation and confidence (M=3.62, SD=.548) in them so that they can complete their research study successfully and on time. Qualitative data showed that they stressed that a supervisor should be a ‘people-oriented person’ and ‘understand them as a person first and then as a researcher’. On the other hand, supervisors
felt students were on the whole responsible but could do with more commitment and responsibility in taking ownership of their own learning.

Supervisory Practices

A majority (87.5%) of the supervisors highlighted that they had not attended any formal supervision course and none of them were accredited supervisors. For most, supervision was a process they learnt from their own personal experience having been supervised during their doctoral studies. Nevertheless, students expressed a moderate level of satisfaction (M=3.32, SD=.369) with their supervisors’ overall supervisory skills and stressed supervisors need to possess a pleasant personality with good research, communication, negotiation, problem-solving and decision making skills. They further highlighted that a good supervisor is one who is kind, understanding and does not ‘scold’, ‘look down’ or ‘talk condescendingly’ to students. They should be ‘patient’ and willing to give time to students to learn and improve. Supervisors further reiterated that supervision is like ‘good parenting’ and they need to be friendly, supportive, motivating, patient and generous with their time. Nevertheless, they also need to be firm at times and provide reasonable time lines and monitor students’ progress to ensure they successfully complete their research project. All agreed that supervisors need to be professional and maintain integrity at all times. Both parties also agreed that effective postgraduate supervision required both parties to have a good relationship with mutual respect for each other.

PG Student Competencies and Readiness for Postgraduate Study:

This aspect of the study investigated PG students’ readiness in terms of their critical reading, writing, research and conceptual skills. The study also explored their competency in digital literacy and ability to take responsibility for their own learning. Results indicated that PG students felt they were only moderately ready (M=3.53, SD=.576) in terms of writing whilst their supervisors felt they possessed limited readiness (M = 2.94, SD = .74). The t-test further confirmed that the difference between the two groups was significant at p <.05 (t [320] = 7.909. A similar significance was seen in terms of students’ critical reading skills where the independent samples t-test result indicated that the PG students perceived that they have a higher readiness in reading skills (M=3.51, SD=.696) when compared to their supervisors’ perceptions (M=2.96,SD=.751). A similar pattern was also seen in terms of students’ digital literacy and use of digital tools in research. Nevertheless, both students and supervisors agreed that students possessed limited research and conceptual skills and digital literacy in using digital tools for research and their dependence on their supervisor was high indicating that their level of independence and autonomy was low in taking responsibility for their own learning and research project.

Institutional Aspects:

On the whole, both students (M=3.03, SD=.523) and supervisors (M=3.27, SD=.482) expressed moderate satisfaction with information and services provided by their institutions. Students expressed a low level of satisfaction towards institutional support (M=2.74, SD=.589) such as information on postgraduate programmes (M=2.86, SD=.726), guidelines of postgraduate programmes (M=2.86, SD=.788) and information on academic staff (M=2.80, SD=.689). They were least satisfied with the lack of financial funding to present their work at conferences (M=2.52, SD=.780) and a suitable work space and access to facilities (M=2.52, SD=.943). Data obtained from openended questions and interview sessions further corroborated these findings. Likewise, supervisors also expressed moderate (M=3.15) satisfaction but felt that facilities for postgraduate students (M=2.53), resources available (M=2.50), financial grants and fellowship applications (M=2.28, SD=.733), training and workshops (M=2.37, SD=.573) for both students and supervisors left much to be desired.

Challenges and Issues:

Another aspect explored were the challenges faced by both parties. Supervisors lamented students’ limited readiness for postgraduate study in terms of writing and critical literacies and insufficient funding and training for both students and supervisors from their respective institutions. Students however felt that supervisors were more concerned with the cognitive aspect of the supervisory process and failed to be more caring and understanding as they were mature doctoral students who take upon numerous roles such as full-time wage earners for the family, a spouse, a mum or dad, a daughter or son helping the immediate and extended Asian family. They also felt that some supervisors often did not to keep to scheduled meetings and were often difficult to contact whilst others felt supervisors did not provide timely and constructive feedback. This was also reiterated Hamidah Mohd, Faizah Majid and Izaham Shah (2013) who highlighted that the students’ three main contentions were power conflicts in studentsupervisor relationship, their supervisors’ lack of positive communication and their lack of expertise in provide constructive feedback and support.
Contributions of the study

Based on the findings of this study, presented below is a proposed framework for effective postgraduate supervision.

![Framework for Postgraduate Supervision](image)

**Figure 1. Framework for Postgraduate Supervision**

The framework is based on the tenets of a holistic approach which hinge on the fundamental principles of connectedness, wholeness and being (Jarvis & Parker, 2006). Therefore, this framework emphasizes the importance of mutual respect, interconnectedness and interdependence among the three main players, i.e. the student, the supervisor and the institution. Secondly, the findings indicated that students looked for a ‘people’ orientated supervisor who not only can motivate and inspire them but also understand the numerous roles they take upon as mature doctoral students which sometimes leave them physically, emotionally and cognitively drained (Sidhu et al., 2015). Hence, the framework also incorporates the noble aspirations set out by Malaysia’s National Education Policy (NEP) where supervisors should ensure that learning is based on the four main domains so that students are cognitively, spiritually, emotionally and physically balanced. Finally, writing a postgraduate thesis is not a linear process and supervisors have to deal with the cognitive and the emotional experience of the supervisees. It highlights the importance a good studentsupervisor relationship and the support of the institution in terms of guidelines, procedures, facilities, training and adequate funding and will ensure the success for all.

**Conclusions**

The findings of this study highlight the need for all the three partners in the learning process to have a clear understanding of their roles and responsibilities so that success can be achieved in helping postgraduate students complete their research projects. The implications of this study necessitate that all partners work in harmony towards achieving a mutual goal. Effective postgraduate supervision has implications for future student lives and workplace demands. Employers around the globe expect postgraduate students to possess a high degree of innovation besides being able to conceive new ideas, services and practices with the aim of improving the current state of knowledge. Hence, this study puts forward a call for supervisors, students and institutions to adopt the suggested holistic postgraduate supervision model in order to help postgraduate students equip themselves with much needed research and conceptual skills during the course of their study towards successful and timely postgraduate degree completion.
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References


Cynicism Towards Educational Change on Job Satisfaction of Teachers in an Educational District - Once Bitten, Twice Shy?

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Abstract

This study investigates teachers’ cynicism towards educational change and their job satisfaction on the implementation of the Malaysia Education Blueprint 2013-2025, a major education transformation effort in Malaysia. Data were collected from 628 practising teachers, selected through cluster sampling from an education district in the state of Perak. Two well-established instruments were used, the Job In General (JIG) scale to measure satisfaction, and the Cynicism About Organizational Change (CAOC) scale to measure pessimism about change being successful and attributing likely failure of change on people responsible for change. The prevalence of teachers’ cynicism toward the blueprint is investigated with descriptive analysis, and hierarchical regression is used to determine the relationships and relative contribution of cynicism toward teachers’ satisfaction. Results revealed the prevalence of cynicism during educational change, with findings demonstrated an inverse relationship between cynicism toward change and job satisfaction. Cynicism toward change explained a significant proportion of variance in teachers’ job satisfaction, with pessimism about successful change having a larger contribution. This implies that situational factors which lead to pessimism during educational change should be addressed in order to ensure successful implementation of change.

Keywords: Cynicism Toward Change, Job Satisfaction, Educational Change

Introduction

The Malaysia Education Blueprint 2013-2025 (MEB 2013-2025) is currently the signatory education reformation package of the nation. It is described as the biggest manifestation of government transformation so as to get the best returns in human capital to drive all national development aspirations. As the country heads towards a developed nation in 2020, this blueprint could well be the final thrust towards the realization of this vision. However, it has been observed that not all reforms have been successful. Some of the less successful ones have been left aside while other newer initiatives are introduced (Malakolunthu, 2010). Many of the reforms have not achieved the impact it purported to produce, with u-turns carried out in the form of major policy changes (Hallinger, 2010; Malakolunthu, 2010). For example, the medium of instruction for Science and Mathematics initially in Malay was changed to English, and then back to Malay again due to the deterioration of student performance for both subjects (Rokiah et al., 2012). Efforts toward implementing ICT in education also did not show clear success. Despite investment of about RM 6 billion over the past decade, ICT usage in schools still fall short with reports that computer use in the classroom has not gone beyond word-processing as an instructional tool (Ministry of Education [MOE], 2013). Not all changes are ideal and past changes that were not successful can leave teachers extremely wary about accepting further attempts of change, predisposing cynicism toward future changes (Wanous, Reichers, & Austin, 2000).

Qian and Daniels (2008) suggested that cynicism towards change is a passive barrier to organisational change. Investigations into this construct is important especially in Malaysia where cultural norms of high power distance and collective attributes result in stakeholders’ inclination to accept educational change without resistance in order to preserve group harmony (Hallinger, 2010). This tendency to avoid public dissent may result in suppressed disagreement and delay change adaptation (Hallinger, 2010).
The Cynicism About Organizational Change (CAOC) scale is a composite of two components: ‘Pessimistic viewpoint about change being successful’ and ‘Blaming people responsible for change for likely failure of change’ (Wanous et al., 2000). This scale was developed based on Attribution Theory which postulates that people are inclined to impute two types of factors when observing an outcome: Situational factors and (or) dispositional factors (Wanous et al., 2000). Situational factors are aspects beyond the control of a person which may affect change such as unexpected departmental budgetary cut, while dispositional factors are within-person factors such as competency of management that determine change success. Based on these factors which cause cynicism, the two components of the CAOC scale was labelled as Pessimism and Cynicism Toward Management (Kath, 2005). This study adapts the two components, and investigates their effect on teachers’ job satisfaction.

Researchers in educational change noted that the global patterns of educational reform overload and teachers’ work intensification has affected job satisfaction (Fullan, 2007). Although teachers’ job satisfaction is a widely investigated construct, it deserves update whenever new changes are introduced, lest these changes result in “self-deceiving public exercise of education reform and a waste of energy and resources” (Nurul-Awanis et al., 2011, p. 110). The inclusion of cynicism in investigating job satisfaction is supported by studies that found negative correlations between cynicism and job satisfaction (Arabaci, 2010), while meta-analysis have noted an effect size of .58 true score correlation (Chiaburu, Peng, Oh, Banks, & Lomeli, 2013). Other researchers have suggested that organisational cynicism has resulted in decrease of job satisfaction level in the last decade (Nafei, 2013). Hence an investigation into teachers’ cynicism toward change would be timely now as there are no known studies which gauge this opinion toward the MEB 2013-2025, at least in the Kinta Selatan education district.

Statement of the Problem

This study aims to investigate the effect of teachers’ cynicism towards educational change on their job satisfaction. While studies have improved our understanding of teachers’ satisfaction, there is a paucity of studies about their cynicism toward educational reformation. Prolonged and widespread cynicism could potentially become a precursor to more aggressive expression of dissent such as resistance to change (Qian & Daniels, 2008). Hence it is important to examine teachers’ opinion during educational change as they are the very people who are tasked to implement changes. It must be noted that a majority of studies done on cynicism have focused on organisations in Western countries (Mohd Noor, Mohd Walid, Ahmad, & Darus, 2013), hence the findings from this study will contribute to bridging this literature gap for Asian countries.

Objectives of the Study

Three research questions (RQ) underpin the current study:

RQ1: What is the level of cynicism among teachers toward the MEB 2013–2025?

RQ2: Is there any relationship between teachers’ cynicism toward the MEB 2013–2025 and their job satisfaction?

RQ3: What is the relative contribution of Pessimism and Cynicism Toward Management as predictors of teacher job satisfaction?

Research Method

A cross sectional design was used in this study. Permission to collect data was sought and granted by the relevant authorities in the Ministry of Education at the federal, state, district, and school level. The 628 participants were selected through cluster sampling from the district of Kinta Selatan. The participants were told they could withdraw from the study at any time and their identity and opinions will be kept in confidence.

The instrument consisted of three sections: (1) Participants’ demographic profile, (2) CAOC scale (Wanous et al., 2000), and (3) JIG scale (Brodke, et al., 2009). Permission to use the scales was sought and obtained. The CAOC consisted of eight negative worded items with a five-point Likert scale (1 = strongly disagree to 5= strongly agree). Higher mean score indicate higher cynicism (Wanous et al., 2000). The JIG consisted of 18 items, and the original scoring format offered a three-point option to indicate the extent participants agree with the scale items.
Results /Discussions

The Cronbach’s coefficient alpha obtained for CAOC and JIG were 0.92 and 0.89 respectively. The first RQ sought to descriptively examine the prevalence of change cynicism toward MEB 2013-2025 in Kinta Selatan district. The second RQ tested the relationship between change cynicism and job satisfaction, and RQ3 investigated the relative contribution of CAOC components in predicting job satisfaction.

In answering RQ1, teachers reported to be moderately cynical towards the MEB 2013-2025 with CAOC scoring a mean of 3.23 (SD = .85). This confirmed that cynicism is a norm in organisations as suggested by Nafei (2013). For RQ2, Pearson correlation indicated a significant inverse relationship between cynicism towards MEB 2013-2025 and job satisfaction (r = -.35, p < .05). Results concurred with research that suggested the potential relationship of cynicism about organisational change and job satisfaction (Arabaci, 2010, Chiaburu et al., 2013).

In addressing RQ3, hierarchical regression analysis was used and some possible confounding variables such as gender, age, tenure and workload were controlled because the participants were working in the same education district and performing similar duties, but varied in these demographic factors. As shown in Table 1, the demographic control variables were entered into Step 1, $F(4, 623) = 2.07$, and failed to account for significant amount of variance in job satisfaction. To enable an appraisal of each component’s individual effects, the Pessimism component was first entered in Step 2, because literature had shown it to be more meaningful in explaining job satisfaction (Polat & Gungor, 2014). Pessimism explained 24.3% of the total variance in job satisfaction with an additional 22.9% of variance explained after controlling for demographic factors, $R^2$ change $= .229$, $F(5, 622) = 16.30$, p < .001. Cynicism Toward Management was entered in Step 3, with the model as a whole accounted for 32.1% of the variance in job satisfaction. This component explained an additional 7.2% variance in job satisfaction, $R^2$ change $= .072$, $F(6, 621) = 15.70$, p < .001. The changes in $R^2$ for both components were significant, indicating that they account for a significant proportion of the variance of job satisfaction. Pessimism was found to explain the larger variance in job satisfaction, affirming earlier literature that this component has higher influence than Cynicism Toward Management on job satisfaction (Polat & Gungor, 2014).

<table>
<thead>
<tr>
<th>TABLE 1 Relative Contribution of Pessimism and Cynicism Toward Management as Predictors of Job Satisfaction</th>
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<tbody>
<tr>
<td><strong>Independent Variables</strong></td>
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<td>Workload</td>
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<td>Pessimism</td>
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<td>CAOC - Mgt</td>
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</table>

$R^2 = 0.01$  \hspace{1cm} $R^2 = 0.243**$  \hspace{1cm} $R^2 = 0.321**$

$\Delta R^2 = 0.229**$  \hspace{1cm} $\Delta R^2 = 0.072**$

$n = 628$, *p < .01, **p < .001.

CAOC – Mgt: Cynicism Toward Management

Implications of the study

This study highlighted the prevalence of cynicism during educational change, adding to the existing knowledge of teachers’ opinion toward major education reformation. One of the items in the scale, “Most of the programmes that are supposed to solve problems around here will not do much good” scored the highest item mean, indicating teachers to be cynical about the effectiveness of the improvement programmes in schools. This constitutes an important finding as teachers are involved in delivering these programmes. This suggest that the
efficacy of these programmes need to be monitored, as some 100 of them are implemented annually in certain districts, leading to a lack of focus, burdening teachers and constraining financial resources (MOE, 2013).

Besides confirming the potential relationship between change cynicism and job satisfaction, the current study delves deeper into this notion by examining the relative importance of the components of CAOC as predictor variables of job satisfaction. The Pessimism component reflects situational factors beyond the control of management, Cynicism Toward Management reflects the blame placed on people for likely failure of change. Both components of Pessimism and Cynicism Toward Management significantly predict job satisfaction with the former component having a larger influence.

Attribution Theory describes the tendency of people blaming external factors for failures, and rarely sees themselves as contributors to the failures (Wanous et al., 2000). Cynicism Toward Management can be decreased by including teachers extensively in the change process as they will have to take ownership of failure if there are no others to blame in the event of negative outcomes. Lastly, job satisfaction may be alleviated when change cynicism is addressed. As CAOC come about through work experiences (Wanous et al., 2000), employees who fail to see improvements in their jobs from proposed changes may direct their resentment toward the job itself and become dissatisfied. Teachers’ job satisfaction can improve if the changes proposed in the MEB 2013-2025 bring about improvements it purports to produce.

Conclusion

Cynicism is a common reaction among employees during change. This study finds cynicism to be also prevalent during educational change with the Pessimism component having larger variance in predicting job satisfaction. As cynicism toward change is predisposed by prior change attempts, the management or change proponents need to deal with previous experiences before implementing new ones. Constant updates of change outcomes can provide some direction. Instead of announcing comprehensive change results at the end, small successes may be revealed continually to imply positive directions of change.

References


Perceptions of Stress Among Female Teachers Enrolled in Postgraduate Programmes in a Malaysian University

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Abstract

The purpose of this study is to examine the perception of stress among female teachers enrolled in postgraduate programmes in a Malaysian university. Previous studies have shown that teachers do face many challenges when it comes to performing their responsibilities as part-time students. Six female teachers were selected as the respondents of this study. The data was collected through voice recorded transcriptions from interviews conducted with the six respondents. The grounded theory was used to categorise and analyse common emerging viewpoints under various themes from the interviews. The results showed that health problems and depression were faced by the respondents. Besides that, these respondents faced many factors that contribute to stress, such as financial fears, work place challenges, work assignments, family problems, lack of social life and having multiple roles to juggle with in their daily lives. As such, alternatives must be developed to overcome the stress experienced by time postgraduate students who are female teachers.

Keywords: Factors of Stress; Perceptions; Postgraduate Studies; Symptoms of Stress.

Introduction

In order for career advancement as well as future financial well-being, many individuals, especially teachers will undertake to enrol in part-time post graduate studies programmes offered by many public and private universities in Malaysia. These part-time studies are often challenging for working students who have to balance the demands of work and family commitments as well as making the grade in their studies. While there have been many studies carried out on student stress (Montgomery and Rupp, 2005; Rafidah, et al, 2009; Kumar and Jejurkar, 2005), there is a dearth of studies on the effects of stress on part-time working students, specifically among teachers.

The fact that teaching is a high stress profession is supported by studies (Bauer et al, 2006; Tennant, 2001; Troman, 2000). Teachers often have to deal with stress related to work, family problems, as well as low self-efficacy. Teacher self-efficacy is the extent to which teachers believe they have the capacity to affect student performance and how well they can influence and motivate students to learn (Brouwers and Tomic, 2000). Self-efficacy has been found in meta-analysis studies (Montgomery and Rupp, 2005) to influence a multitude of critically important variables like student achievement, social attitudes, self-esteem, and motivation as well as perceptions of stress levels. A study of Finnish teachers (Simola, 2005), find that these teachers experience some stress, with having to meet various student needs in their classrooms and balancing a home life, are at the same time very satisfied with their work and enjoyed teaching. These experiences are atypical of most teachers in learning institutions because of the social trust, respect and support Finnish teachers enjoyed from the local communities and governing bodies. These teachers continuously receive in-service training and are expected to pursue higher qualifications (Malaty, 2007). The effect of such investment in human resource, trust and respect is reflected in the latest PISA scores for Finland which placed the country’s 15 year olds as having very high problem solving skills (Ripley, 2013). The next section will discuss the effects of stress on teachers and the influence of perceptions on stress.
Stress among Teachers

Stress in this study is defined as a physical, mental and emotional response to various demands, changes, and events in life (Sergerstrom & Miller, 2004) and can cause a reaction both physically and emotionally to individuals. It is something which occurs whenever individuals must adapt to changing conditions (Lazarus, 1991). However, taking into consideration the nature of a teacher’s job, where they have to deal with ‘stressful students’ and ‘difficult work settings’ (Tennant, 2001), stress can damage lives, end careers and affect teaching standards (Holmes, 2005). Further to this, Mathison & Freeman (2006) note that a majority of teachers describe their work as extremely stressful. When teachers enrolled for postgraduate studies, it will add on to their already stressful situations which Vaez and Laflamme (2008) linked to various negative outcomes such as poor health, depression, and poor academic performance. Other studies have found that stress also lowers self-esteem, decreases awareness of one’s health (Hudd et al, 2000), decreased time management ability (Misra & Mckean, 2000) and overall academic under performance and failure (Kuman & Jejukar, 2005).

Objectives of the Study

This study will explore the experiences of six part-time postgraduate students in different disciplines through semi-structured interviews. It is underpinned by the following research questions (RQ):

a. What are the symptoms of stress experienced by female teachers who are part-time students?

b. What are the factors that contribute to their stress?

Research Methodology

The grounded theory was used in this study to provide a rich and deep understanding of the participants’ stress symptoms, the factors that contribute to their stress, its implications and what could be done to improve their condition. The grounded theory will allow an approach that is centered around understanding the phenomenon of stress that is experienced by these teachers (Creswell, 2003). The transcripts were coded. This allowed the process of segmenting and labelling of text to form descriptions. It allowed the researchers to summarise and synthesize the development of the data collected. Interviews were conducted with six respondents, who are female teachers pursuing their postgraduate studies in master degree programmes.

A set of questions designed to get pivotal information for this study was used. During the interview, questions were used as probes so as to get a clearer picture of the views of the respondents. The interviews were tape recorded and transcribed verbatim. The transcriptions were read through to get an overall understanding of the respondents’ experiences and then coded into categories which are discussed in the results section below.

The consent of the respondents was obtained before each interview session. All the transcriptions were shown and verified by the respondents for research ethical consideration purpose.

Results

RQ a. What are the symptoms of stress experienced by female teachers who are part-time students?

i) Health problems

Headaches, migraines and high blood pressure were mentioned as health problems experienced by the respondents. For instance, teacher AB mentioned;

“I had a lot of headaches and migraines and my blood pressure level has gone up as well.”

ii) Depression

The respondents felt depressed because they were not able to complete their work in a timely manner and do their normal chores as well. School work such as marking books and writing reports were not carried out as systematically as before. The respondents were slacking in their routine household chores as well. Teacher AD noted

“There are three problems I face, I have to work, take care of my family and then study, manage problems related to home. Before I started pursuing my postgraduate studies, I could focus on my teaching, but now no longer with all the assignments.”
One of the respondents, teacher AB even talked about her piling unfolded laundry. When probed further about their depressed feelings, the respondents described it as feeling down, sad and not being good enough in playing each of the self efficacy.

“I come back from school at 5’clock in the evening daily and I will rush to do house chores and I even skipped folding clothes.”

Teacher AC felt she was not a good mother because she could not give her full attention to her children.

“I feel I don’t spend enough time with my children and they just get basic care.”

RQ b. What are the factors that contribute to their stress?

The following are the factors found to cause stress in the respondents:

a) Financial fears.
The respondents felt insecure about their financial status. They cited high cost of living as a reason for their fears. Teacher AF mentioned;

“I need my salary to take care of the living cost expenses and the expenses have gone up ever since I started my postgraduate studies. I cannot opt for unpaid leave because I have three children.”

b) Workplace
Inability to keep up with their work in school was cited as a cause of stress. Worry about complaints from parents and colleagues were constantly present. Teacher AA mentioned;

“There are many problems at my work place. I do not have enough of time to mark. I have to set exam papers and mark them and miscommunication with the teachers especially the principal can be a challenge.”

c) Assignments
The respondents claimed that the assignments and examinations were difficult to manage, although they agreed that it had to be challenging for a master degree programme. Teacher AG mentioned;

“I feel when it comes to exams and assignments it is very stressful because I have to meet my lecturers’ high expectations and at the same time I have to ensure that the assignments are meeting the par set for postgraduate level.”

“I have to study for my assignments, project paper and exams and at the same time I will be beating the date lines to submit assignments on time.”

d) Family problems
Unsupportive family members were mentioned as one of the factors that caused the stress. The respondents described uncooperative and unsupportive husbands as stressful. Teacher AC mentioned;

“I can’t depend on my spouse much because he doesn’t give much positive support by trying to understand that I am currently a part time postgraduate student and the amount of dilemma that I am going through.”

e) Lack of social life
A lack of social life where there was an outlet to de-stress was cited as one of the factors that contributed to their feelings of stress. Teacher AB mentioned;

“I do not attend most of the family functions because I have to attend classes on weekends.”
Multiple roles

Juggling and balancing roles the respondent had to play was not easy and they did not know how to prioritise. Teacher AF mentioned;

“I have multiple roles and function like a robot. I have to juggle with many roles and deal with many matters at the same time.”

Discussion

The symptoms of stress such as poor health and depression support the research of Pietromonaco, Manis & Lane (1986). Dunkel-Schetter and Lobel (1990) noted that financial fear was a common cause of stress as working students cannot resign from their work in order to upgrade their education. The results of this study also support this finding.

The results also showed that the respondents had difficulty balancing their career and family commitments similar to the findings of Choy & Cataldi (2006) and Watts (2008). Juggling and striking a balancing among these different roles was a major concern for the respondents. This had affected their relationship with family members and peers.

Although the stress of examinations and coursework could not be avoided the respondents in this study pointed out that they had difficulty managing their priorities and time. Although the study by Misra & McKean in 2000 showed a correlation between stress and time management and that increased management skills led to decreased stress levels, the findings of the current study did not seem to support this. The respondents in this study argued that there were too many jobs to be done and there was not enough time complete them.

There is a growing demand for masters’ holders among teachers and as such more research is warranted that better assist faculty, administrators and policy-makers in understanding the distinct needs and experiences of studying part-time especially among teachers. After all these teachers are pursuing further studies so as to better equip themselves so that they can teach better.

Conclusions

We conclude by suggesting that governmental and institutional efforts be undertaken for a better understanding of the complications experienced by part-time postgraduate students who are female teachers. At the same time, multi-faceted initiatives must be developed to support the stress faced by these female teachers.

References


Development of Career Related and Teamwork Skills Using Service Learning in Undergraduate Architecture Education

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Abstract

Current teaching and learning methods adopted in architecture education seems to have limited effects on developments of student’s career related and teamwork skills. There is an urgent need to address these issues that directly affects the graduates employability and performance in the future. Service-learning pedagogy in architecture teaching and learning will have positive impact that will contribute towards betterment of architectural education and the profession. A descriptive study was conducted using survey instrument in local private higher institutions. The study results revealed that students who were taught using service-learning teaching pedagogy reported development of career related and teamwork skills.

Keywords: Service-learning; Pedagogy; Architecture education; Career related skills; Teamwork skills

Introduction

Traditionally in undergraduate architectural education teaching and learning takes place in classrooms and studios with virtual site or real site with no engagement. Teachings of most of the modules including design are taught using case studies of past projects by various designers or instructors. Such methods often fail to engage students as the learning environment and context is usually not enticing to them. Salama (2009) stated that knowledge is usually presented to students in a retrospective approach where abstract and symbolic generalizations used to explain research results do not deliver the feel of the behavior of the phenomena described (p. 11). This limits their learning experience and this affects their confidence in applying their learning content knowledge and skills in practice in the future. Gerlenter and Mazumdar referred this type of teaching practice as hypothetical as they are largely unconcerned with real life conditions, ignoring equally important skills that can be enhanced through experiential learning, research, or actual interaction with the realities being studied (as cited in Salama, 2006, p. 66).

Therefore, service-learning incorporation in undergraduate architectural education is believed to solve the current pedagogical issue as service-learning naturally has hands on learning activities in real life environment. Malkawi (1999) stated that service-learning is a pedagogy that is distinctively relational, as it helps in reducing the gap between practice and theory (p. 123). Barrie (2001) asserted, “for students, service-learning with ‘real world’ projects provide a potent setting for multidisciplinary teamwork and engagement with the public in a setting where their work is taken seriously and the outcomes valued” (p. 90).

Hence, the study intended to investigate the development of career related and teamwork skills in students that are essential for an architect in modules that used service-learning pedagogy in undergraduate architecture education.

Research Problem

Current teaching and learning methods adopted in architecture education seems to have limited effects on developments of student’s career related and teamwork skills.
Based on the skills survey results conducted by RIBA Appointments and Newcastle University in 2011, relating to employers’ expectations when employing architectural graduates, Kamara (2012) reported that both students and employers highlighted concerns about students’ preparedness to work in the industry. The concerns were mainly related a lack of practical skills and knowledge among students of immediate benefit to employers (End Note, para. 4). The survey also indicated employer were unsatisfied with Part 1 graduates are not ready for work (End Note, para. 5).

RIBA (2011) graduate attributes for part 1 clearly expresses that “Part 1 will be awarded to students who have knowledge of the context of the architect and the construction industry, and the professional qualities needed for decision making in complex and unpredictable circumstances” (p. 8). Despite the commitment by architecture schools to provide architectural education that will enable its graduates with skills that is related to architectural practice, a recent employer survey conducted at institutional level show graduates still lacks employability skills (HEI 2, Employer Survey, 2014).

The RIBA Practice Committee commissioned a study and the RIBA Constructive Change Group produced report in 2005 for deliberation and action by the RIBA and wider architects’ profession. The report revealed that the architectural profession was lacking leadership, both within the profession and in its ability in influencing the broader industry and government (RIBA, 2005a, p. 11). Suggestions were by the committee to RIBA was to refocus architectural education and necessary training to train the future architects (p. 16).

According to Zaliza Hanapi and Mohd Safarin Nordin (2013), another research finding conducted on Malaysian graduates show a lack of technical skill and poor employability skill among the graduates is one of the factors that lead to the unemployment problem (p. 1057). The Skills Survey Report from RIBA Appointments the recruitment arm of the RIBA (2014) highlighted that employers and recent graduates are not impressed with the skills and abilities of newly qualified architects. Results of the survey found that both the employer and graduates agree that recent graduates are not equipped with the practical skills required to practice architecture and additionally most of them lack the knowledge to construct what they design (RIBA, 2014).

Another employability competency expected of architecture graduate is teamwork ability. LAM (2016) criteria for accreditation stipulate, “At Part I students will be able to show clear and logical architectural designs that integrate the ability to work as part of a team”. Nicol and Piling (2005) argued that the familiar model of architectural education appears unlikely to nurture a positive attitude in students towards teamwork, as it remains primarily geared to developing individual stars rather than preparing team players (p. 6). Falk (2012) suggested that service-learning course which often utilizes valuable teamwork and service-learning activities provides value added opportunities for students to learn about and reflect upon the teamwork (p. 5).

Based on literature the researcher was of the opinion incorporation of service-learning pedagogy in architectural teaching and learning will have positive impact that will contribute towards betterment of architectural education and the profession.

**Objectives of the Study**

The objective of this study was to determine the relationship between the development of students’ career related and teamwork skills and service-learning pedagogy in undergraduate architecture education.

**Research Methodology**

The study used a quantitative method of descriptive approach using the survey design (Creswell, 2012). Data was collected from participants during a single brief time period. The students examined in this study include those who have taken the module with service-learning pedagogy and students whom have taken the same module without the service-learning as teaching pedagogy. The sample of this study comes from two (2) private higher education institutions in Klang Valley, Higher Education Institution 1 and 2 (HEI 1 and HEI 2) to offer a variety of perspectives. The respondents for this study come from year two (2) and year three (3) of undergraduate architecture programme. Estimated population in both institutions are about 320 students and from table by Krejcie and Morgan (1970) the sample size for the study was calculated as 175 numbers. However, the total number of respondents for this study was 215.
Instruments of the Study

To find the answers for the research questions the researcher adopted and customized an existing quantitative survey instruments measuring students’ learning outcomes. The customization was done after the researcher reviewed the programme learning outcomes of both architecture programmes. Two experts from architecture then validated the survey instrument.

Data Collection Procedures

The administration of survey instruments took place in the classrooms of the various groups participating in the study. The survey instruments were randomly distributed to year two and three undergraduate architecture students. Data collection in the study was only conducted for students whom had completed the identified modules.

Framework for Data Analysis

The study employs a quantitative method using the survey design (Creswell, 2012).

Descriptive Statistics

Descriptive analysis was used to analyze the data using frequency, mean, scores and standard deviations of independent variable (IV) and dependent variable (DV) in SPSS v. 20 and standard deviations.it was used in this study to show respondents demographics profile. Based on the mean scores, the development students’ learning outcomes was explained.

Inferential Analysis-Correlation and Regression

Pearson Correlation analysis was conducted in SPSS to determine the relationship between the development career related and teamwork skills and service learning pedagogy in undergraduate architecture students. The generated “r” value and “p” value shows the strength of relationship and significance of the relationship between the variables.

This study data analysis used regression analysis to indicate if the career related and teamwork skills (CRT) have a significant relationship with the service-learning pedagogy. Regression analysis also indicates the relative strength of independent variable effects on a dependent variable. Using regression analyses in the study assisted to make predictions. The estimated regression model using data of career related and teamwork skills was generated and interpreted to explain the relationship between the variables.

Results /Discussions

Survey results revealed that about 81.4% of respondents of the survey are year two (2) students and 18.6% of respondents are from year three (3). The survey results revealed that about 76.3% of respondents has taken modules that used service-learning as pedagogy (service learners) whilst 23.7% respondent reported they have not taken any modules with service-learning pedagogy (non-service learners). Among the service learners respondents almost 80% of them are from year two and 20% of them are from years three of architecture studies (see Table 1 and 2 below).

The score for career related and teamwork skills (CRT) had a mean score of 3.94 (SD = 0.486) for service learners and 3.82 (SD = 0.468) for non-service learners. This result showed that service learners scored higher than non-service learners did and there was significant development of this this ability in service learners. This finding suggests that that there is a positive relationship between development of student’s career related and teamwork skills (CRT) when service-learning pedagogy was used in teaching and learning.

As seen in Table 4, the mean score of 4.12 (SD = 0.672) for item CRT 3 - I have a realistic understanding of the responsibilities of an architect, identified as the highest developed outcome by service learners. Non-service learners scored highest mean 4.08 (SD = 0.771) for item CRT8 - I have a clearer understanding of my job scope as an architect. This highest score was followed by item CRT 2 - (M = 4.10, SD = 0.694), I am able to work well in teams and with others. CRT7 - I became more interested in the architecture field represented by this course (M = 4.08, SD = 0.801) and CRT8- I have a clearer understanding of my job scope as an architect (M = 4.02, SD = 0.759) for service learners. Whist, non-service learners mean score was high for CRT7 (M = 4.04,
Survey of the fifty-one (51) non-service learners for career related and teamwork skills factor ($M = 3.76, SD = 0.559$) and service-learning pedagogy ($M = 1.11, SD = 0.545$), revealed Pearson’s $r$ data analysis of very week positive strength and not significantly correlated, $r (51) = 0.003, p = 0.983$.

Regression analysis suggested a moderate positive relationship between career related and teamwork skills (CRT) and service-learning pedagogy (SL). In other words, the service-learning pedagogy (SL) was predicted by development of career related and teamwork skills (CRT) in students.

Using the ANOVA development of students career related and teamwork skills (CRT) outcomes was a significant predictor of service-learning pedagogy, $F(1,162) = 16.764, p = 0.000, R^2 = 0.343$. Student’s career related and teamwork skills (CRT), was a significant predictor of service-learning pedagogy (SL), $\beta = 1.388, p = 0.005, R^2 = 0.343$. The regression analysis can be explained using model below.

$$SL = 1.388 + 0.660(CRT)$$

**Summary of Study Results**

Factor analysis CRT skills showed a high mean score for by both service learner and non-service learners. However, the mean score for non-service learners are still lower than the mean score by service learners. Service learners identified development realistic understanding of an architect’s role and responsibilities whilst non-service learners identified clearer understanding of their job scope an architect as the most developed outcome.

Pearson’s correlation analysis to find the strength of relationship between the independent variables CRT and SL. revealed a positive moderate strength of relationship with for service learners. Whilst for non-service learners Pearson’s correlation analysis of CRT and SL revealed a very week positive relationship to service-learning pedagogy.

Further analysis of this factor revealed a moderate positive strength of relationship and significance in development of CRT skills for service learners whilst for non-service learners the result of the study revealed a very weak relationship with SL pedagogy and no significance in development of CRT skills.

**Discussion**

The study results elucidated that career related and teamwork skills outcome has moderate positive strength toward service-learning pedagogy, and it is a significant predictor of service-learning pedagogy. Similar finding was reported by exploring business students’ experience of service learning in the community. Students reported that their interpersonal skills for work-in a team had improved over the course of their community placement (Clinton and Thomas, 2011, p. 61). This study result corresponds to earlier study result where students in the industrial technology program that participated in service-learning showed enhanced leadership skills as reported by the employers in their feedback. (Ejiwale, 2008, p. 6).

Service-learners in this study reported that they learn about the roles and responsibilities as a designer and are more interested in the field. Service learners also gained self-confident to solve real issue using skill and knowledge learnt in classroom. Result matches earlier studies by Dick, Carter and Ingram (2014) reported that students gained confidence in themselves and their ability to work through a problem (p. 71). Preliminary conclusions support research that service-learning is a valuable tool that augments theoretical education students receive with practical experience prior to joining the workforce (Dick, Carter & Ingram, 2014, p. 66).

This study revealed that incorporation of service-learning pedagogy supported the development of positive team experiences for students. Service learners reported that they have acquired skill to work with community and peers. It appears that students successfully internalized teamwork knowledge and skills. Falk (2012) reported that students of a community services for families were able to use appropriate language to communicate about teamwork, including terms such as “team cohesion, and “mutual respect” (p. 10). This study result also agrees
with earlier reported findings by Vaughn (2010) who used service-learning as part of her small group communication course and found it to be a useful method in developing students’ appreciation for teamwork.

**Contributions of the study**

This study implies that by embracing the service-learning pedagogy may assist undergraduate architecture education in meeting the accreditation criteria for part 1 graduates set by both local and international accreditation bodies, RIBA and LAM part 1.

The study also suggests that service-learning pedagogy can help to elevate some of the dissatisfaction of employer by ensuring student have sufficient amount of practical skills when entering the practice. The incorporation of this pedagogy also can assist reducing the gap between employers’ expectation and architecture graduates employability skills.

**Conclusions**

Study survey analyses revealed that service learners reported significant development of CRT as compared to non-service learners in similar courses. This study suggests that service-learning as a teaching pedagogy can influence the development of student’s CRT skills. Students who were taught using service-learning teaching pedagogy have shown development in career related and teamwork skills.

The architecture education is designed to include real world learning experiences as part of its teaching and learning and service-learning pedagogy is form of experiential learning pedagogy in which students engage in activities that addresses real community needs. Both these teaching programs has one common thing that is the “real world experience” where students work on real problems that make academic learning relevant and simultaneously develop their career related and teamwork skills and form a partnership with external community organizations.

**Figures/Display Elements**

*Table 3*

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<tr>
<th>Factors</th>
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<th>Non-service learner Mean</th>
<th>Non-service learner SD</th>
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*Note: Sample size N=215*

*Table 4*

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<th>Career related and team work skills</th>
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<th>Service learner SD</th>
<th>Non-service learner Mean</th>
<th>Non-service learner SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRT1 I now have the ability to lead a group of people.</td>
<td>3.71</td>
<td>0.865</td>
<td>3.43</td>
<td>0.806</td>
</tr>
<tr>
<td>CRT2 I am able to work well in teams and with others.</td>
<td>4.10</td>
<td>0.694</td>
<td>4.00</td>
<td>0.721</td>
</tr>
<tr>
<td>CRT3 I have a realistic understanding of the responsibilities of an architect.</td>
<td>4.12</td>
<td>0.672</td>
<td>4.02</td>
<td>0.761</td>
</tr>
<tr>
<td>CRT4 I have acquired the skills to work in a career that contributes to society.</td>
<td>3.96</td>
<td>0.729</td>
<td>3.82</td>
<td>0.817</td>
</tr>
<tr>
<td>CRT5 I can successfully resolve conflicts with others.</td>
<td>3.74</td>
<td>0.788</td>
<td>3.59</td>
<td>0.759</td>
</tr>
<tr>
<td>CRT6 I became more interested in a career in community related work.</td>
<td>3.91</td>
<td>0.721</td>
<td>3.65</td>
<td>0.955</td>
</tr>
<tr>
<td>CRT7 I became more interested in the architecture field represented by this course.</td>
<td>4.08</td>
<td>0.801</td>
<td>4.04</td>
<td>0.72</td>
</tr>
<tr>
<td>CRT8 I have a clearer understanding of my job scope as an architect.</td>
<td>4.02</td>
<td>0.759</td>
<td>4.08</td>
<td>0.771</td>
</tr>
<tr>
<td>CRT9 I am confident to solve real life issues with specific skills and knowledge.</td>
<td>3.85</td>
<td>0.745</td>
<td>3.75</td>
<td>0.688</td>
</tr>
</tbody>
</table>
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Higher Education Policy Governing the Future Vocational Skills Development in the Hospitality Sector – An Example from Ireland

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Abstract

While tourism figures are set to increase worldwide, there exists a palpable skills shortage in the broader tourism and hospitality industry at all levels. Nevertheless, most governments appear to be slow to address this skills shortage at a strategic policy level. Using the Irish context as an example, this paper aims to evaluate government higher education (HE) policy responses to skills shortages in other sectors such as the medical devices and ICT sectors and to assess whether and to what extent these could be applied to the hospitality and tourism (H&T) sector. The lessons learned from the Irish example can also be applied to other countries that experience a significant growth in tourist numbers and that are faced with similar skills shortages.

Keywords: Higher Education Policy; Hospitality and Tourism; Ireland; Vocational Skills Development

Introduction

Industry data on the hospitality and tourism industry for the last number of years has consistently demonstrated that there exists a skills shortage at all levels in the industry not just in Ireland, but all over the world. The World Travel & Tourism Council highlights that 37 of 46 countries in their 2015 report struggle with a talent deficit in this sector (WTTC, 2015). This is due largely to a sharp increase in tourism figures in recent years, which is set to be sustained into the near future (UNWTO, 2015). In the Irish context, the the Expert Group on Future Skills Needs (EGFSN) (EGFSN, 2015) predicts a skills shortage of up to 13.6% and a total skills demand of about 100,000 people in the period up to 2020. Yet, the Irish Government like many other governments has failed to date to respond at a policy level to this skills shortage. Other industries, such as the information and communication technology (ICT) sector, are facing similar shortages. The Irish Government’s response to shortages in other sectors has been both comprehensive and multifaceted. The aims of this paper are to evaluate Irish Government higher education (HE) policy responses to skills shortages in other sectors such as the medical devices and ICT sectors and to assess whether and to what extent these could be applied to the hospitality and tourism (H&T) sector.

Research Problem

Coordinated successful government HE policy responses to demonstrated skills shortages appear to be few and far between. Yet, the skills shortage, which negatively affects the broader H&T industry is tangible and well documented. Some best practice approaches to addressing skills shortages exist. However, the question arises as to whether these may be applicable to the H&T industry.

Objectives of the Study

The key objectives of this study are to assess government HE policy responses to skills shortages in different sectors with a view to replicating these in the H&T sector.

Research Methodology

This paper is exploratory and explanatory in nature. The data collection method is based primarily on secondary research of reports, policy documents and news items published on the Internet, which are alluded to and referenced in this paper. This information is supplemented with information obtained as part of the researcher’s involvement in the steering group for the EGFSN on Assessing the Future Skill Needs of the Hospitality Sector.
The H&T sector in Ireland continues to grow and 2014 saw a year on year increase of 8.9% to 7.6 billion visitors, which generated the equivalent of 20.7 billion Malaysian Ringgit (4.7bn Euros) in revenue (CSO, 2015). There are currently 139,800 people employed in the sector. This equates to 7.4% of total employment (CSO, 2014b). However, overall tourism related employment is closer to 200,000 (Fáilte Ireland, 2015). In fact, the World Tourism Organisation asserts that one in every 11 jobs is tourism related (UNWTO, 2015).

According to the Irish Central Statistics Office (CSO), the accommodation and food service activities sector showed the highest growth in employment among all industry sectors in 2013 (CSO, 2014b). By 2025, the Irish Governments expects visitor numbers to rise to 10 million, which will generate 5 billion Euros to the economy as well as provide 250,000 jobs (Fáilte Ireland, 2015). Considering the expected prolonged growth in tourist numbers and growth in the number of jobs associated with the industry evidence suggests that a significant skills shortage in all areas (front and back of house) will develop if this was not addressed (EGFSN, 2015). While the demand for third level graduates form the industry is high, for instance hotel corporation’s graduate management programmes only focus on honours degree graduates (Jooss and Burbach, 2016), the skills levels in the H&T sector tend to be low. Given the growth in employment and the current arguably low levels of educational attainments of employees in this sector, government support in terms of policies are required to remedy this discrepancy.

Existing HE Policies Governing the H&T Sector:

Irish education policy in the H&T sector dates back to 1963 when CERT (the Council for Education, Recruitment and Training) was established by the Irish tourism board, now Fáilte Ireland, to deliver education and training in the developing tourism sector. Due to a change in government policy, that is a move away from training provision, and the resulting lack of funding the provision of these de facto apprenticeships ceased. In the absence of any government policy, a small number of Vocational Training Colleges provide H&T related programmes. In addition, most Institutes of Technologies (polytechnics) offer various undergraduate degree programmes in the broader H&T sector. According to figures obtained from the Irish Higher Education Authority, almost 1000 students graduated from these programmes in 2012. However, the number of students graduating from these programmes is insufficient to satisfy the demand from industry. In 2013, the Irish Government announced a renewal of the apprenticeship system and, in 2016, the Department of Jobs, Enterprise and Innovation (DJEI) set up a nationwide hospitality skills oversight group to advise on strategy and policy in response to the skills needs report mentioned above (EGFSN, 2015).

Government HE Policy Responses to Skills Shortages:

Ireland’s economic success story has often been attributed to its ability to attract Foreign Direct Investment (FDI) in areas such as medical devices, information and communication technology (ICT) and pharmaceuticals and the government has taken various steps to address skills shortages in areas considered to be pertinent to its continued success of Ireland in attracting FDI.

At secondary school level, the Irish Government introduced bonus high school points in 2010 for those students taking advanced mathematics as a subject, which has arguably led to an increase in students taking the subject and, perhaps to a lesser extent, augmented the number of students opting for third level courses related to the smart economy (Donnelly, 2014). However, an initiative such as this cannot exist in isolation and thus ought to be combined with complimentary stratagems. In 2013, the EGFSN released a report that identified the future skills needs in the ICT sector up to 2018 (EGFSN, 2013), which highlighted a shortage of 44,500 employees over the following six years and furnished a number of recommendations. These included a revision of the existing ICT Action Plan (launched in 2012), ameliorating the quality and quantity of ICT skills, attracting ICT talent, improving the attractiveness of Ireland as an ICT hub, and tackling the ICT skills issue (by introducing a variety of programmes to improve ICT skills). The updated ICT Skills Action Plan represents collaboration between Government, industry and education (DJEI, 2013). Measures included in the plan to address the ICT skills shortage, which could also be adopted to address the H&T sector skills shortage comprised conversion and reskilling HE programmes, efforts to double the number of graduates, provide specific ICT programmes for the industry, to develop a web-based portal to expedite work placements, and to generate an awareness of ICT in education (DJEI, 2013). These schemes have been replicated successfully in the medical devices sector.
Another piece of the jigsaw is the Springboard initiative, which has been in operation successfully for a number of years now. This initiative is aimed at reducing the number of unemployed by providing short courses of up to one year in length designed to furnish participants with the necessary skills to re-enter the labour market. Springboard has always included a call for programmes in ICT skills conversion, medical devices, logistics. For the last two years funding is also available for H&T programmes. Arguably there exists a danger in focusing a large amount of resources on addressing skills needs in a particular sector, as experience has shown that shifts in economic fortune or an oversupply of labour in a specific area may have long-term detrimental effects for the skills development in other sectors and the economy as a whole. For instance, over the last number of years, vast resources have been expended to retrain jobless engineers, which is a legacy of the (failed) Irish property boom. Thus, any strategy to address skills needs must be both short-term and long-term, comprehensive, multileveled and its potential consequences (particular on skills development in other areas) have to be very well thought through.

### Potential Government HE Policy Responses to Skills Shortages in the H&T Sector:

As the skills shortages in the H&T sector appear to be immediate as well as ongoing, strategies to address these shortages ought to be both short-term and long-term in nature. However, it is crucial that even the short-term solutions feed into a long-term strategy. Similar to the ICT Action Plan, an H&T action plan should be a collaborative undertaking involving industry, education and the government. Above all, it is essential to garner industry buy-in, as the training and internship must take place in industry and some solutions can only be delivered in conjunction with industry.

In the short-term, approaches should include a comprehensive suite of short courses in a variety of key H&T areas *inter alia* front office, reservations, food and beverage service, baking, pastry, and other culinary skills. The government should introduce a model comparable to the City and Guilds qualifications (e.g. City and Guilds, 2015), which represented the industry standard for many years. However, each short course should be accredited and should, if accrued, lead to a qualification on the Irish qualifications framework. In order to centralise the provision and in order to make these programmes more attractive to employers and employees some of the programme delivery should be online. Currently however, the provision is far too fragmented and much more thought needs to be given in order to address this.

Following the ICT Action Plan, the government should support one-year conversion undergraduate and postgraduate programmes in order to retrain existing graduates from other disciplines.

Another mechanism to attract people to the industry could be the JobBridge scheme, which offers unpaid job placements to the unemployed to gain industry experience (Department of Social Protection, 2015). However, this scheme should incorporate a HE component to ensure that participants do not just gain an internship but also an opportunity to further their education. Yet, this scheme is not without its critics and RTÉ (the national broadcaster) even referred to it as a ‘JobBridge to nowhere for some interns’ (RTÉ, 2014).

Using the ICT Skills Action Plan as a template (DJEI, 2013), the key to success in creating greater awareness of opportunities in the H&T sector are a range of high school based programmes. For instance, higher education institutes (HEI) as well as industry representative organisations should follow the example of the IHF, which has set up regular visits to schools to promote jobs in the industry. Moreover, subjects relating to the H&T sector should be introduced at primary and secondary school levels. This of course would also necessitate a degree of retraining of existing teachers in order to be able to deliver these subjects as well as a national curriculum and additional government funding in these areas.

Following on from this, two to three year apprenticeships with a national curriculum, similar to those in the German dual vocational training system, should be introduced. The German system relies on input from both employers and vocational training colleges in equal measure. That requires a high level of regulation and, above all, buy-in from employers. However, this could be problematic in the Irish context without the necessary guidance from government, due to the large number of interest groups and the fragmented nature of the education and training sector. Deficiencies in the German system have illustrated that it is critical to incorporate access routes to HE. Graf (2012, p. 49), for instance, highlights the ‘historically evolved strong institutional divide between the vocational education and training system and the HE system’ of the German model. This divide was further cemented by the introduction of the new German qualification framework in 2012. Austria, Switzerland and Denmark on the other hand introduced measures, which created vocational training models with more flexibility and with better access routes to HE (Ebner, 2009).
Another HE option is the fastest growing segment of German and Austrian HE, which are dual study programmes. In Germany for example, the student numbers on these courses grew by 21% in 2011 (Graf, 2012). These are offered by so-called Dual Universities of Applied Sciences. Founded upon the same principles as vocational training in Germany, students in dual HE spend as much time in industry as they do in college, which makes them more attractive to industry. Owing to the applied nature of the H&T sector, this model could be an ideal solution to any skills shortages, as the students remain employees of the same employer, which sponsors the students, throughout the programme.

**Contributions of the study**

This paper adds to the body of knowledge in vocational education by elucidating the need for a set of government policies to overcome a demonstrated skills need in a particular sector. Furthermore, the paper offers a number of comparisons and practical solutions to address the labour shortage in the H&T sector.

**Conclusions**

In the absence of HE policy to ensure the future skills development in the H&T sector, this paper endeavours to explore potential strategies to address the labour shortage in the sector in the future. It is evident that there exist no ‘quick fix’ solutions to remedy any labour shortages. Nevertheless, as these shortages are acute, both short-term and long-term strategies are required. The paper also highlights that any solution ought to be comprehensive, multifaceted, multilevel and well thought out. In addition, any policy necessitates the close collaboration of government agencies, education and industry.

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Quality Control in Physical Education in Malaysia: Relooking at the National Strategy for Quality Physical Education

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Abstract

This presentation will examine the national strategy for Quality Physical Education (QPE) in terms of teacher education supply and development; facilities, equipment and resources; curriculum flexibility, monitoring and quality assurance; and community partnerships. The first part of the presentation will explore the characteristics of QPE and the stakeholders (both public and private) in the context of QPE delivery machinery. In the second part of this presentation, we will explore past as well as upcoming challenges in achieving QPE in Malaysian schools. Next, the third part will examine QPE strategies. The final part will analyse actions taken by the Malaysian government, relevant agencies and private sectors in providing QPE in Malaysian schools. Specifically, we will first study the national strategy for QPE in relation to the Malaysian Ministry of Education’s (MOE) continuous efforts in improving PE syllabus and pedagogy. This will be analysed based on the Education National Key Results areas (NKRAs) within the Government Transformation Program (GTP). Other governmental initiatives studied include “sport for all” strategies, namely the Strategic Plan (2010-2015) of the Ministry of Youth and Sport Malaysia and the ‘1Student, 1Sport’ policy of the MOE. Lastly, the presentation will also include initiatives by the MOE’s Teacher Training Division towards training more qualified PE teachers, initiatives by the private sectors in providing training for sport and recreation through private facilities, and researches on PE in Malaysia.

Keywords: Physical education, quality assurance, curriculum, community partnership.

Introduction

PE is a compulsory subject for primary and secondary schools in Malaysia. It is considered important by the Ministry of Education (MOE) in promoting the modern concept of education that is the development of the ‘whole child’ (Wee, 2013). The Malaysian school curriculum is committed to developing the child holistically along intellectual, spiritual, emotional, and physical dimensions, as reflected in the National Education Philosophy (NKRAs: Malaysian Education Blueprint 2013-2025, 2012). As a non-examination subject, PE has received numerous negatives reports such as unqualified teaching staff, lack of facilities and equipment, lack of staff development program, the Malaysian public do not understand and value the role of physical activity-exercise-sport in life and society, society gave little value to PE, and students have negative attitude toward PE by Malaysian researchers (Aniza & Fairuz, 2009, Chong & Salamuddin, 2010; deVries, 1975, 1990; Salleh, 1997, Sarkawi & Jani, 2006, Sebastian, 2006; Nursan, 2010, Wee, 2001, 2006, 2009, 2013, Wee, Khor & Jamatul, 2004). Thus it is imperative to examine the quality control in Malaysian PE program.

Research Problem

“Physical and Health Education is a non-examination subject given little regard in the scheme of things in an exam-oriented school culture. Often, its periods are used to teach subjects which are of more academic value” (Frederick, 1998, Sunday Times, p. 8). The scenario prompted the Malaysian Minister of Education, Dato’ Najib Tun Razak (present prime minister) to comment: “There is a need to change the notion among some school heads that Physical Education is less important than other subjects” (Frederick, 1998). In a survey of secondary school students, The Star Newspaper (27 November, 2011) reported some observations which revealed current scenarios in school PE. Some students were positive about having PE lessons while others were not interested. Those students who were interested complain about the lack of time, regimented lessons, lack of physical
activities except stretching, the loss of opportunity to de-stress before main examinations, and there were no proper changing rooms except toilet cubicles.

This presentation is important as ‘physical education is the most effective means of providing all children and youth with the skills, attitudes, values, knowledge and understanding for lifelong participating in society” (The Declaration of Berlin 2013: UNESCO 2015).

Objectives of the Study

This study examined the quality control in PE and specifically the national strategy for Quality Physical Education (QPE) in terms of teacher education supply and development; facilities, equipment and resources; curriculum flexibility, monitoring and quality assurance; and community partnerships.

Research Methodology

This paper applied the case study approach to examine the quality control in PE in Malaysia. Specifically, documents including government documents, physical education reports, UNESCO report, research and journal papers were examined to provide supporting evidences to the discussion. The analysis of data includes examining, categorizing and arranging the evidence examined in order to address and answer the questions that make up the foundation of this study. Interpretations were made based on the categorization and analysis of the content of relevant documents and previous research data on physical education program implementation in Malaysia.

Results /Discussions

The characteristics of QPE and the stakeholders

QPE is the planned, progressive, inclusive learning experience that form part of the curriculum in early years, primary and secondary education (UNESCO, 2015). QPE acts as the foundation for a lifelong engagement in physical activity and sport through PE lessons which provide children and youth psychomotor skills, cognitive understanding, and social and emotional skills they need to lead a physically active life (afPE, 2008). World-wide PE Survey (UNESCO Final report, 2013) provided evidence-based data which stated that ‘Quality assured inclusive PE Curricula’ includes qualified teachers, support personnel, timetable allocation, finance, National/Regional Governmental PE strategies, community partnerships, facilities, equipment, and teaching resources.

In Malaysia, in the context of PE, the stakeholders include, school, Ministry of Education, Teacher Training Institute, Curriculum Development Department, Federal Inspectorate and Quality Assurance Division, National Sport Council, National Sport Associations, Olympic Council of Malaysia, and private sport and physical activity organization.

Challenges in Achieving QPE In Malaysian Schools

Teacher Related Challenges

The Ministry of Education (2008) reported that the majority of teachers who teach PE in Malaysian schools are non-specialist in the field, and only 30.8% of them hold a degree in PE. In a study of 38 schools in the state of Selangor, Kamil et al. (2012) found that of the 413 teachers assigned to teach PE, only 28.1% had a bachelor's degree in PE.

Student Related Challenges

In terms of attitude toward PE, Chong and Salamuddin, (2010) reiterated that students lack enthusiasm toward PE and were not interested to learn skills. Earlier reports from the MOE (the Secondary Schools Inspection Report, 2007, 2008; Nursan, 2010) reported that only 25-41 percent of the students attended PE classes punctually and tried hard during class activities.

Administrative Related Challenges

a. Supervision/ Monitoring of PE teaching

Numerous observations from various sources were reported. According to Tan and Lee (2014), observation and supervision of PE lessons by Principals did not take place. Similarly, Wee (2007) reported that only about
50.6% of principals ‘frequently’ and always’ did so. In addition, there was no observation plan by the PE Curriculum Committee and teachers did not prepare their lessons (Wee, 2008). The lack of supervision in PE was reported in the PSIR and SSIR (2007); only 18.5% (8 of 46 schools) carried out the mandatory supervision at school level.

b. PE classes are expendable

PE classes are expendable, as it is regularly used for the teaching of other more important subjects such as mathematics and science, especially when the public examination is around the corner (Chong & Salamuddin, 2010). This was earlier reported by Wee (2009) that 73.7% of principals ‘always’ allowed PE classes to be used to teach other subjects.

c. Staff Training Program (STP)

The status of STP was reported by Sebastian (2006), where 30.8% of schools never organized STP, 62.9% organized 1-3 times annually. MOE (2007) reported 29.4% secondary school organized STP. Similarly, Wee (2009) reported that only 14% of the principals in 290 secondary schools organized in-house training programmes.

Structure Related Challenges

The problem of the lack of facilities and equipment was reported by Chong and Salamuddin (2010) and Syed Ali, Zahidi and Ab Samad (2014). Most schools surveyed lacked equipment and spoilt equipment were not repaired or replaced.

The National QPE strategies

The QPE strategy is examined in terms of teacher education supply and development; facilities, equipment and resources; monitoring and quality assurance; and community partnerships.

Teacher Education Supply and Development:

The supply and development of teachers is tasked to the MOE’s Teacher Training Division (TTD). In Malaysia PE teachers are trained under a centralised system of teacher preparation. The MOE plans the curriculum, selects the trainee teachers and finances the cost of training for the training in teacher training colleges, awards teaching scholarships to undergraduates in the universities (Wee, 2013). TTD has embarked on a transformation programme to produce more PE teachers through the short, medium and long term approaches. The detail of the programme are as in Figure 1.

In addition, in order to overcome the shortage of PE teachers, MOE has introduced a new 6-week pilot Intervention Training Program for Extra Option Secondary School Teachers (Pito). This program has started in December 2011 at several public universities, targeted the Science and Mathematics teachers nationwide. The teachers selected for the program will choose History, PE or Geography as their second option subject. However, it is still unclear if teachers would choose the PE subject as their second option subject (Wee, 2014).

![Figure 1: Future Direction for Teacher Education (MOE, 2012)](image-url)
Community Partnerships:

This section looks at the initiatives by the private sectors in providing training for sport and recreation through private facilities or using the existing school facilities. Programmes and initiatives to develop non-academic components are present both during formal class time as well as through a variety of after-school co-curricular activities. The shortage of facilities, equipment and teachers are overcome through the initiatives of private companies. The private sectors responded well in providing training for sport and recreation through various private facilities. Private companies train children in various aspects such as games, self-defence, swimming and gymnastics. Children can improve their badminton skills with paid coaching classes offered by trained coaches. Similarly, gymnastic centres train children in gymnastic skills and promote self-confidence. At times, private companies are also involved directly in school co-curricular activities. Activities such as gymnastics and self-defence (tae- kwon-do, karate, wushu and silat) are incorporated into the school co-curriculum programme. Students are allowed to register in the particular programmes that they are interested in. Private sectors support the school programmes by providing qualified coaches. The coaches would be paid for by the school through students’ subscription.

Monitoring and Quality Assurance in PE:

Malaysia present education system has only a PE curriculum. All schools in Malaysia implement the same PE curriculum, teach the same number of periods weekly and use standard text books supplied by Text Book Division of the Ministry of Education.

In the effort of maintaining quality, continuous efforts in improving PE syllabus and pedagogy was carried out by MOE. The PE curriculum which was standardized in 1999 was reviewed in 2002. Again in 2003, the new inputs were added to make the teaching of PE more relevant with the changing time. Currently continuous efforts to impart new pedagogy knowledge through in-house training in PE have been emphasized in schools.

In 2009, the Education National Key Results areas (NKRAs) under the Government Transformation Programme (GTP) has been established to improve students’ performance in schools in addition to providing them with access to better quality education.

The important role PE can also be seen as a part of the Strategic Plan (2010-2015) of the Ministry of Youth and Sport Malaysia (MYSM). The plan included among others the initiative to make sport for all a Malaysian culture. To complement PE programme in school, Ministry of Education Malaysia has introduced ‘sport’ as a new subject into the school timetables. This is implemented under the ‘1Student, 1Sport’ policy where secondary school students would get 90 minutes a week to play a game of their choice, while primary pupils would spend 60 minutes weekly (Utusan, May 23, 2010). This programme would provide access to all students especially those who are least active/inactive to benefit from participation in sports and consequently increase student participation in at least one type of sport.

Facilities, Equipment and Resources:

Wee (2001) and Sebastrian (2006) surveyed secondary schools in Peninsular Malaysia (300 schools) and Sarawak and found that majority of the schools often have a soccer field (77.2%, 92.3%), netball court (75.7%, 76.9%), volleyball court (71.6%, 61.5%) and badminton court (56.7%, 69.3%). However, Syed Kamaruzaman et al. (2014) in a survey of 310 PE teachers from 155 schools in the State of Perak found that the PE facilities were inadequate (mean = 4.2) and often the fields or open spaces were crowded due to many classes were scheduled to use at the same time. Syed Kamaruzaman et al. also found that field were unsafe to be used by the students, and the field was often narrow. As for the equipment, it was reported insufficient as broken equipment were not replaced or repaired. Similarly, Kamil et al. (2012) in a study of 416 PE teachers in 38 schools in the state of Selangor revealed that almost 72% of the PE teachers was not qualified. Kamil et al. also found that schools shared PE facilities during the same duration thus contributing to limited spaces and hindered student physical activities. On the other hand Syed Ali et al. (2014) found that the shortage of PE option teachers has prompted the schools to combined two classes at one time and PE teachers were asked to teach PE to 70-80 students. This has contributed to insufficient equipment and lack of facilities in PE classes.

In addition, MOE has prepared a teacher guidebook for PE to help PE teachers in teaching and to ensure the content delivery. Currently, the guidebook for PE is available on line. Besides the resources from MOEM, the Health Promotion Board of Malaysia (HPBM) has produced numerous resources to be used as teaching and reference materials by HPE students and teachers. The resources include Basic Health Promotion Programme.
Contributions of the study

This paper provides indepth deliberation on the implementation of PE in Malaysian schools. It provides various information on the challenges in the teaching of PE and in the implementation of PE programme in schools. It also provides information on the availability of teaching and learning resources. Lastly, it also provides information on the synergic efforts from the public and private sectors in overcoming issues in the teaching and learning of PE in schools.

Conclusions

It is hoped that this paper has contributed to the ensuing debates on the teaching and learning of PE in schools. PE curriculum and its implementation have been the profound interest of various strata of the Malaysian society. Quality PE classes are expected to incorporate curriculum that help students develop knowledge, skills, behaviors, attitudes, and confidence to adopt and maintain healthy lifestyles. Learning in PE is through the psychomotor, cognitive and affective domains and is imperative in developing a rounded person.

References

Diagnosing Higher Education on purposefulness: Introducing the Employability Development and Assessment Maturity Model (EDAMM)

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Abstract

Employability has been on the political agenda for over 2 decades. The role of Higher Education (HE) in the development of employability in its learners is undeniable pertinent and with that, the Higher Education Institutions’ (HEI’s) ability to offer an effective developmental process in this regard shapes the current competitive climate in HE. Be it at various levels of priority, employability has furthermore emerged as a formal indicator of quality assurance in national and international accreditation frameworks for HE. Aside from their evaluative purpose, such frameworks also aspire to nurture and support a spirit of continuous improvement to the benefit of the institution, its learners and the larger society they are part of. Even though there is an abundance of literature around employability and HE which indicates the value of a holistic view and subsequent institutional address, this must be advanced to the development of practical tools that address such a holistic approach. A mechanism that simultaneously allows for diagnosing the effectiveness of the developmental process and serves as a pathway for improvement is up to date lacking. Given the importance of employability as a strategic goal for sustainable HE, the formulation of such mechanism is timely. This paper presents the current state of development of a Maturity Model on how HEI’s can tackle employability, viewing this construct from a holistic lens. The paper will also outline future steps in order to further validate the model towards a highly robust quality assurance tool for HE.

Keywords: Higher Education, Employability, Maturity Model, Quality Assurance

Introduction

In light of the new economic and societal realities of the 21st Century against the backdrop of the emergence of the knowledge economy and the knowledge society, employability has become a major item on the national and supranational political agenda around the world (Oliver, 2011, 2015). Additionally, economic and societal trends of globalization, increased mobility of labor and increased access to education have resulted in changed career perspectives whereby the onus has shifted to the individual in terms of career-management (Sook et al, 2012). The emergence of the knowledge economy in particular has re-ignited a debate that has been latent since the 1960’s around how well HEI’s perform in their contribution to the development of the required human capital for societal and economic progress.

Even though acknowledged as an issue for decades, the gap between the profile of new graduates that enter the world of work and the current labor market requirements remains a topic of discussion and concern (Jackson, 2013, 2014; Vande Wiele et al, 2015). The scholarly understanding of the construct of employability has changed over the last few decades whereby extensive studies on the topic have illuminated its highly complex, relative (Clarke, 2008) and continuously evolving nature (Gazier, 2001). Up to date however, the construct still suffers from ambiguity around what it is. The authors view the construct of employability from a holistic perspective meaning that a person’s employability concerns three influencing factors of intrinsic, extrinsic and actionable nature (Vande Wiele et al, 2014). Such view requires HEI’s to give consideration to the elements inherent to the individual (e.g. competencies), elements in one’s direct or wider environment (e.g. socio-economic factors) and notions around engagement and experience in employability related context (e.g.
education, work experience, networking, etc.) when designing and an educational value offering that will deliver on its promise of employability development.

Research Problem

Even though the address of HE towards employability has been given ample attention in the literature (Oliver, 2015), its notion has more often than not been treated in a compartmentalized manner. The complexity of the employability construct, and the HEI as a system are likely two of the reasons why holistically systematizing the interplay between both has only scarcely been attempted (Maher, 2011). Up to now destination data have been the standard measure to evidence employability as a result of HE (Bridgstock, 2009) however more attention is needed to evidencing the process of employability development to effectively tackle the issue (Mayur and Johnson, 2014). In light of the position employability has taken in the context of national and international quality assurance frameworks and purposeful HE, the development of a mechanism that allows for both evaluation and continuous improvement is highly relevant and timely giving rise to two research questions that frame this paper: RQ1. How can a HEI address employability? RQ2. How can a HEI be diagnosed on its address of employability with the eye on continuous improvement?

Objectives of the Study

This paper aims to present the current state of a larger on-going study that tackles the development of a diagnostic tool concerning HE institutional practice for employability: the employability development and assessment maturity model (EDAMM). The development of such model will identify and describe effective employability-conducive HE practices spanning across the totality of institutional activities – addressing RQ1. The descriptions will sketch different sophistication levels of the processes and approaches HEI’s can take to address the goal of employability of its learners – addressing RQ2.

Research Methodology

Following a Design Science methodology, this study has adopted a qualitative approach for theory building through multiple case studies (Eisenhardt and Graebner, 2007), principles of design science (Hevner et al, 2004) and principles of maturity modelling (Mettler, 2011). The model is constructed using the three cycle approach by Hevner (2007) consisting of a central design cycle supported by a relevance cycle and a rigor cycle. Three purposefully selected case studies were developed through thematic analysis of in depth interviews with key information, institutional documentation, information in the public domain and personal observation. The selected cases concerned undergraduate business programs spanning across three continents to avoid a one sided perspective on education. The data per case study was coded in two rounds: 1. coding according to five themes identified through extensive literature review (Vande Wiele et al, 2014) and 2. coding at theme level according to emergent subthemes. After this within-case analysis, the findings of each case were subjected to cross-case analysis in search for literal or theoretical replication logic (Yin, 2012) in order to develop gradient descriptions of employability-conducive institutional practices to reflect different levels of process sophistication.

Results /Discussions

The submission guidelines for this paper do not allow the presentation of the write up of the case studies or the various descriptions of subthemes that lead to the model. Therefore, the results will be presented in a summarized and synthesized manner by means of presenting the current, most up to date version of the EDAMM (Table 1). The case studies identified five general levels of process sophistication and five themes with a total of twenty two subthemes. These allow to comprehensively describe an institutional process to address employability, addressing RQ1. Maturity modelling from a potential-performance-perspective, following the perspective of Crosby (1979), allows not only for evaluating a process but also outline potential pathways forward towards improving quality results. Adopting such approach fits well with a suggestion towards answering RQ2. Even though the objectives of this paper can be argued to have been met, the content and applicability of the model however require further validation in order to be confident in answering both research questions rigorously, particularly RQ2. This will be addressed in the conclusion section by outlining future next phases in this research endeavour. To comply with the paper guidelines, the authors have opted to limit the description to the theme-level1 across the five maturity levels following typical maturity model development practice (Mettler, 2011).

1 For in depth description of the subthemes contact the corresponding author.
Contributions of the study

A first contribution of this study is the strengthening of the methodological approach of Design Science to produce knowledge artefacts and in particular maturity models. This pragmatist methodology is rather novel compared to the longer standing traditional methodological lenses applied in the research field of theory development and modelling for complexity. A second contribution is the development of a model that considers and outlines the complexity of the HE process and its address of employability by means of identifying and qualifying critically relevant activities to employability development and assessment at an institution wide level. This contributes to the body of knowledge around effective HE practices for employability by investigating a variety of operational sub domains of HE such as curriculum, support activities, quality control, leadership and industry relations. A third contribution concerns the introduction of maturity modelling in the context of employability and purposeful HE. Maturity modelling has been widely used for diagnosis, process quality control and improvement in a variety of fields, inclusive of HE (Vande Wiele et al, 2014), but is a novel approach in the context of quality assurance for employability, addressing a dire need in today’s HE landscape.

Conclusions

This paper has concisely reported on the first phase of an in depth approach to developing a mechanism to diagnose the address of HEI’s to employability and simultaneously inform for improvement. This phase concerns the combination of exhaustive literature review and three case studies towards the design of a first version of the EDAMM. The second phase of the study has as its objective the validation of the model through expert consultation and scrutiny by means of a Delphi Technique to result in the proposal of a valid diagnostic model for quality assurance in the context of purposeful HE for the 21st century.

References


<table>
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<tr>
<th>Sub-theme C: Curriculum Enhancement and Pedagogical Models</th>
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**Table 1: The Employability Development and Assessment Model**

<table>
<thead>
<tr>
<th>Curriculum</th>
<th>Support Services</th>
<th>Industry Relations</th>
<th>Quality Measurement</th>
<th>Leadership</th>
</tr>
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<tbody>
<tr>
<td>A theory dense curriculum that is delivered and developed by pure academics in the field through tutor centered mechanisms that focus on the acquisition. Programme delivery is linear and development does not consider employability factors beyond theoretical knowledge.</td>
<td>Support services are very scarce, understaffed, poorly communicated and typically limited to ad hoc activities around careers, Engagement of internal or external stakeholders is low to nonexistent and the services contribute at best only minimally to the development of employability.</td>
<td>There is no formal or systematic mechanism around the development of industry relationships because it is not valued as pertinent towards the building of employability of the graduates. Existing relationships are passive and superficial, providing few insights in the labor market.</td>
<td>Quality control around employability is not considered important or beneficial for improvement. It is addressed through a compliance approach using simplistic destination data for reporting purposes.</td>
<td>Employability does not have a formally articulated strategic place in the core or supporting activities of the HEI. It is not part of the organizational culture and employability is not seen as a potential competitive advantage.</td>
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<td>The curriculum is for its majority focused on theoretical knowledge with some application through low level authentic learning approaches linked to some general abilities in the field of study. The curriculum is generally informed by the external environment and designed, delivered and controlled by academics with minor industry experience.</td>
<td>Support services consist of a series of activities particularly oriented towards employment upon graduation. The activities are not systematically organized or institutionally orchestrated. Engagement of learners is overall limited and the results of the efforts are not very impactful.</td>
<td>Industry relations develop rather organically at departmental level than systematically. The relationships are mainly conversational in nature serving primarily the institutional rhetoric and PR purposes. The connection with industry only limply impacts the approach of the HEI to the development of its value offering.</td>
<td>Quality considerations around employability are predominately considered by articulating espoused quality vs requirements of the labour market. Explored through destination data and justified by very general, practice-oriented and highly semantic measures in terms of the process that is in place. Employability is included in institutional quality discourse but is only sporadically used as a measure or driver for improvement.</td>
<td>Employability is recognized as a potential competitive advantage but the institution lacks implementation of strategic discourse. Relevant organizational structures and processes exist but are inactive or ineffective. The organizational culture does not capture the concept of employability beyond semantic rhetoric. Good practice around employability is suggested but experiences difficulty in terms of uptake or adoption at institutional level.</td>
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<td>The curriculum is student centered and focused on the application of knowledge. It is realized through learning experiences across a gradient of authenticity by faculty members with considerable industry experience teaching in the latter part of the programme. The programmes are informed by field specific labour market requirements resulting in curriculum that is oriented towards the development of both or industry specific competencies.</td>
<td>Systematic, formally planned approach to a variety of activities supporting employability by a formally trained department. Involvement of external stakeholders (participation or information exchange) is the norm and resulting in meaningful opportunities for learners to enhance their employability. Engagement of learners is most common among seniors.</td>
<td>There is an institutional department for industry relations. The relationship is developed as a partnership of information exchange to inform a meaningful HE value offering with occasionally highly invasive collaboration.</td>
<td>Quality in terms of the process is given attention through the identification of measures for quality control. Employability is actively included in the quality management of the curricular practices alongside with some minor consideration that is given to the monitoring of support activities. Analysis and reconfiguring is happening in various departments in isolation from one another and lacks a systematic and institutionalized mechanism to make it feed into a larger plan for improvement.</td>
<td>Employability is a formal part of the strategic plan to strengthen the institution’s competitiveness and its fit for purpose. The organizational culture reflects commitment and enthusiasm around employability development in pockets of curricular activities, but lacks organization wide buy in. The organization shows commitment towards employability as a formal priority through endorsing an institutional approach to employability based on best practice, designated structures and relevant associations with external entities.</td>
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<td>With employability as its central tenet, a wide variety of internal and external stakeholders are involved into the design, development and delivery of the curriculum that aspires to instil general, field specific and career competencies in its learners. The faculty involved in the development and delivery of the programme have strong currency with industry practice.</td>
<td>Support activities are governed by qualified experts in career services and treated as an integral part of the institutional transformation process for employability. Services are developed and delivered through high involvement of relevant internal and external stakeholders. Engagement of learners is high and the results around career management skills uptake, opportunities for experience and graduate employment are significant.</td>
<td>The institution addresses industry relations through a basic relationship management system resulting in synergistic relationships with clear goals and deliverables. Industry is highly involved in strategic and operational sides of curricular and support activities.</td>
<td>Quality around employability development is managed throughout the transformation process in a holistic manner. Detailed data from a comprehensive set of stakeholders is compiled and analyzed in an institutionalised systematic way towards monitoring both process and outputs of all relevant activities. Reporting results in action plans for quality improvement that fit in an institutional quality improvement plan.</td>
<td>Employability is viewed through a holistic lens and considered a strategic priority. It is institutionally contextualized through the development of an HEI strategy. Detailed data from a comprehensive set of stakeholders is compiled and analyzed in an institutionalised systematic way towards monitoring both process and outputs of all relevant activities. Reporting results in action plans for quality improvement that fit in an institutional quality improvement plan.</td>
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<td>The curriculum evidences best practice and effectiveness in terms of design, development and delivery for employability towards a highly effective approach of developing life-long learners. The learning environment is transformational and consistently produces well balanced individuals with a holistic set of competencies relevant for the economic and societal realities of today and the future. The curriculum is continuously re-aligned with industry and delivered by a hybrid faculty of cutting edge practitioners/educators with a good sense of career guidance.</td>
<td>Support activities are highly aligned and responsive to the economic and societal realities and form part of the knowledge base of the organization around developing employability in the learners. The staff is highly current with recruitment and talent management practices in industry. Engagement of learners is highly and includes co-creation of service value. The results are highly significant in terms of developing very impactful career management skills and facilitating the securing of highly meaningful employment opportunities.</td>
<td>The institution uses a sophisticated knowledge exchange system to manage its industry relations in order to advance a sustained mutually beneficial relationship. Industry becomes the demanding party for collaboration and partnerships, resulting in a leveraged network towards securing support, the creation of opportunity and a highly competitive profile in the HE landscape.</td>
<td>The institution continuously monitors the transformation process for its development of employability against a highly up-to-date objective of industry and societal measures inclusive of professional accreditation in both industry and educational context. Using highly detailed and comprehensive data, it continuously fine tunes its process and is highly responsive and agile towards economic and societal dynamism. The institution is considered as a high level benchmark in terms of HEI and employability.</td>
<td>Every organizational activity gravitates towards employability development which is considered as the primary purpose of the HEI. The organization has staked its core and primary supporting activities around employability development with people who are well experienced in realizing employability through HEI resulting in employability being woven into the organizational fabric. The institution drives the cutting edge around employability development through incremental and radical innovation.</td>
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Designing a Multidisciplinary, Integrated Curriculum in Logistics and Supply Chain Management

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Faculty of Arts, Computing, Engineering and Sciences, Sheffield Hallam University, UNITED KINGDOM

Abstract

This paper presents experience gathered nearly over a decade in designing and enhancing postgraduate curriculum in logistics and supply chain management (L&SCM). It focuses on how a radically different curriculum was produced to give students a well-balanced exposure to a range of subject areas. Initial design and regular enhancements made based on a wide range of feedback are also presented. The paper concludes with further innovative approaches required to enhance the overall student experience.

Keywords: Multidisciplinary & Integrated Curriculum, Logistics and Supply Chain Management

Introduction

Globalisation requires robust and efficient supply chains which can deliver goods and services at affordable prices on time. To be successful in ever increasing competitive markets, supply chain operators continue to embrace new technologies and techniques which enable them to drive costs down further and improve service levels. Over last few decades, supply chain operations have transformed from simple transaction-based systems to highly sophisticated and integrated networks.

In late 90s, to meet the rising demand for supply chain professionals, higher education institutes around the world, predominately led by business schools, launched postgraduate programmes to up-skill professionals and young graduates. With business schools roots, these programmes naturally focused on “management” aspects of supply chains. Whilst contemporary management theories played a major role in shaping supply chain strategies and operations, increasingly cutting-edge IT systems and other state-of-the-art technologies began to play a critical role. Although proliferation of postgraduate programmes continued, their focus remained more or less on management subjects.

This paper presents the design and development of a radically different multidisciplinary and integrated L&SCM curriculum which aimed to achieve a balanced distribution of essential subject disciplines.

Research Problem

As highlighted above, logistics and supply chain management curriculum continued to develop around management themes. Whilst these courses immensely helped professionals to develop the skills required to manage and operate supply chains, they hardly provided opportunities to develop an understanding of emerging technologies. One other noticeable omission was “design” aspects of supply chains. The bulk of the curriculum focused on how to manage existing supply chains but the design aspects was largely overlooked.

Objectives of the Study

Having recognised these gaps, around 2005, a team of Sheffield Hallam University academics with engineering and technology backgrounds began to explore the development of a radically different curriculum. The primary objective was to develop a balanced curriculum which reflects all essential subject disciplines that contribute to the design, operation and enhancement of supply chains and their associated logistics.
Research Methodology

The design of a radically different curriculum requires careful planning and engagement of various stakeholders. This section aims to highlight the key stages of the development process.

Formation of the core team

Led by two professors, a team comprising subject experts on Management IT, Engineering, Technology and System Design was formed to undertake the design and development task.

Review of Literature

The main purpose of literature review was to develop better understanding of existing curricula and emerging industry needs. Closs & Stank (1999) provided a good insight into the benefits and challenges faced in developing an integrated program in L&SCM at Michigan State University. As for benefits, authors argued that the development of the integrated curriculum increased staff exposure to cross-functional teaching and research and provided better learning experiences to students. Furthermore, the feedback from the industry was more positive than expected as the industry welcomed the multidisciplinary nature of the programme. In terms of challenges, resistance to change and moving away from "subject silos" were main barriers. Bandyopadhyay (2004) reported a results of a survey of L&SCM syllabi of thirty (30) AACSB accredited Business Schools. One of the conclusions of their study was that “most U.S. business schools curricula on L&SCM based on an operations or logistics perspective”. Through a detailed analysis of curricula they identified fourteen (14) subject disciplines:

(a) Location, (b) transportation and logistics, (c) forecasting, and planning for inventory, (d) marketing and channel of distribution, (e) sourcing and supplier management, (f) information and electronic mediated environments, (g) product design and development, (h) service and after sales support, (i) reverse logistics and green issues, (j) outsourcing and strategic alliances, (k) global issues, and (l) just-in-time production and distribution, and (m) total quality.

With the exception of information and electronic mediated environments, all subject disciplines were “management” related. At that time however, several publications highlighted increasing role of IT and other technologies such tracking and automation (Keith 2002; Kumar. & Crawford 2001; Srivastava 2004; Swartz, 2000; Zuckerman 2000)

The literature survey confirmed that despite the increasing role of technologies, the development of L&SCM curriculum continued to focus on management related topics. The analysis also supported the hypothesis that supply chain design aspects were hardly built onto the curriculum.

Hoek (2001) reported that L&SCM education was not meeting the needs of employers. Three specific criticisms were cited;

- A lack of market relevance
- A lack of practical and professional skills development
- Poor research capabilities on the part of students

As a way to address the above shortcomings, Hoek (2001) proposed that “hot topics” should be incorporated to keep up with the rapidly changing demands of industry.

Multidisciplinary & Integrated Curriculum

Following the literature analysis, the team concluded that the only way to create a radically different programme was the development of a multidisciplinary and integrated curriculum. It was therefore decided to create the new curriculum base on three-pillars; Management-IT-Technology. This multidisciplinary approach ensured that students have an exposure to a balanced mix of subjects which play essential role in design, management and enhancement of supply chains.

The team also decided to embrace the concept of integrated curriculum as it brings different dimensions to a single module (Drake & Burns, 2004). An integrated curriculum fuses subject areas, experiences, and real-life
knowledge together to make a more fulfilling and tangible learning environment for students. For example, several subject areas such as forecasting, inventory management and distribution were included in a single module titled as Logistics and Enterprise Information Systems. Additionally, Enterprise Resource Planning (ERP) was also integrated into the module to demonstrate how ERP is used to support each of those subject areas.

**Integrating Experiential Learning**

Several members of the course development team had many years of teaching experience in engineering programmes where experiential learning had been used to provide students with hands-on learning exercises that complement their in-class education. Experiential learning is a method by which experiences are transformed into knowledge (Miles, Melton & Ridges 2005). The team ensured that almost all modules have experiential learning opportunities. For example, systems modelling and simulation module used an industry standard simulation platform enabling students build simulation models of real situations.

**Validation of the conceptual design**

Before the programme was finalised, a consultation with major industrialists was initiated to ensure that the programme met the expectations of industry. A number of companies including Rolls Royce and BAE SYSTEMS were approached to capture their feedback on the programme. A few senior academics from other institutions also provided valuable comments. Such feedback and comments led to some changes in the programme/module structures. For example, transportation aspect of the programme was strengthened after feedback.

**Using industry standard software**

Where possible, the team wanted to introduce industry standard software to supplement teaching. As Sheffield Hallam University has been a long-term member of SAP University Alliance, various SAP modules were introduced to improve the practical nature of the programme. The programme also used ARENA simulation systems to introduce basic modelling and simulation concepts.

**Professional Accreditations**

Securing professional accreditation was crucial to demonstrate that the curriculum fits with industry and professional body needs. The programme was accredited by the Charted Institute of Logistics and Transport (UK) first then recently by the Charted Institute of Procurement & Supply (UK).

**Continuous improvement**

The team continued to capture feedback from students, alumni and industry and monitored sector trends and new software solutions. Over a period of 10 years, a significant number of improvements have been made to improve the distinctiveness and relevance of the course. Changes include;

(i) Embedding more ERP content in the curriculum hence the replacement of Logistics Planning and Control with Logistics and Enterprise Information Systems

(ii) Creating opportunities to build realistic simulation models with the introduction of SupplyChainGuru software opposed to basic models with ARENA and optimisation mdoels

(iii) Providing a clear focus on procurement and supply through the introduction of a new module, Strategic Sourcing and Procurement to

(iv) Introducing CLASS simulation software to enhance teaching in Warehouse Management & Transportation module.

**Results /Discussions**

By adapting a systematic approach to the curriculum design process, the team produced a radically different programme in 2007 encompassing all essential disciplines i.e. Management, IT and Technology. Curriculum also included supply chain design aspects.
Through a programme of continuous improvements, the curriculum has been significantly enhanced to incorporate contemporary topics (Table 1).

**Contributions of the study**

This work demonstrates the benefits of multidisciplinary and integrated curriculum development process.

**Conclusions**

Curriculum development should be regarded as a continuous improvement project, particularly in areas such as Logistics and Supply Chain Management which are fast developing sectors. Whilst core management philosophies continue to play a core role, emerging technologies are making big impact on how supply chains are designed, managed and enhanced. Hence the continuous improvement is vitally important to ensure that professionals and graduates are exposed to the latest developments in industry. The course team is now working on a project to further enhance student experience via connecting students to businesses, communities, alumni and research groups.

**Tables**

<table>
<thead>
<tr>
<th>2007</th>
<th>2016</th>
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<tbody>
<tr>
<td>Project and Quality Management</td>
<td>Project and Quality Management</td>
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<tr>
<td>Supply Chain and Manufacturing Strategy</td>
<td>Global Supply Chain and Manufacturing Strategy</td>
</tr>
<tr>
<td>Finance and Marketing</td>
<td>Finance and Marketing</td>
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<tr>
<td>Lean Operations</td>
<td>Lean Operations and Six Sigma</td>
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<tr>
<td>Logistics Planning and Control</td>
<td>Logistics and Enterprise Information Systems</td>
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<tr>
<td>Systems Modelling and Simulation</td>
<td>Supply chain Modelling and Simulation</td>
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<tr>
<td>Warehouse Systems and Transportation</td>
<td>Warehouse Systems and Transportation</td>
</tr>
<tr>
<td>Business Process Management</td>
<td>Strategic Sourcing and Procurement</td>
</tr>
</tbody>
</table>

Table 1: Course Transformation – from 2007 to 2016

**References**

C11

The Use of Online Videos to Support Mathematics Education for Pre-Service Educators: How Much “Face” Should I Show?

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Abstract

One of the key drivers underpinning mathematics education in general, and more specifically mathematics education at a university level, is the use of Web 2.0 technologies to support the delivery of courses to undergraduate, primary pre-service teachers (PSTs). Unfortunately the drive online hasn’t always been matched with a matching drive to support developments in online pedagogy. This paper examines the use of various combinations of video lectures to support content and pedagogical knowledge development and, just as critically, to enhance the affective experience of mathematics education for PSTs studying primary mathematics education.

Keywords: Adult Pedagogy, Mathematics Education, Online Education, Video Lectures

Introduction

For many years school mathematics education has resulted in detrimental outcomes for future pre-service educators in terms of their attitude towards mathematics. These negative outcomes are often worsened by the inappropriate use of Web 2.0 technologies in university mathematics education. Here I offer alternate pedagogical models for mathematics education based on developing both affective and cognitive domains which incorporate the use of embedded video in online lectures for 2nd year Pre-Service Teachers (PSTs) undertaking a core mathematics education course. This research is significant given the increased use of online education in universities.

Research Problem

The meta-analysis of Kay (2012) reports that current research concerning online lectures generally indicates that students’ feelings or emotions towards their use were predominantly positive. Positive aspects included enjoyment and satisfaction in watching the online lectures, increased levels of motivation, sustained attention, reduced levels of anxiety, and increased connectivity with the course lecturer. In the cognitive domain a large body of literature exists on the various positive outcomes for student learning when supported by online lectures (see Giannakos et al., 2015).

According to Ronchetti (2010, p.45) the main advantages of online lectures were their ability to

   a) help working-students by bridging the gap given due to their absence during regular lectures;
   b) support regularly attending students by giving them the opportunity to recover lectures lost due to forced or elective absence;
   c) assist students having difficulties with the lecturer’s spoken language; and
   d) give students a means to review critical sections and check their notes.

Research into online lectures by Kay and Kletskin (2012), reported improved learning, perhaps due to some of the affective outcomes reported earlier including: freedom of students to engage at times suitable to them and their learning; improved independence, self-reflection and efficacy; and increased opportunities for revision for exams and assignments. These aspects, when combined with the ability to replay the lecture as needed, suggests that online lectures are a powerful tool for enhancing learning. The focus of this paper concerns the use of video in online lectures; therefore, only a snapshot of the literature in concerning online lectures has been provided.
The remainder of the literature review will focus more specifically on the targeted use of video in online lectures and the impact of such use on engagement and learning.

A line of research has established that video mimics many of the social cues of face-to-face communication. Kizilcec, Bailenson and Gomez (2015, p. 730) report that “learners ignore the mediated nature of the lecture experience and perceive the instructor as a social actor, and they respond by mindlessly applying learned social rules”. Furthermore, the use of video is thought to lead to increased attentiveness from the learners. Kizilcec et al. (2015), also report that paying attention to online lectures is easier when the lecturer’s face is made available and that “the combination of hearing speech and seeing the instructor’s face or gesture and speech was found to alleviate learners’ cognitive load” (p. 729) with accompanying positive impacts on student learning. Wang et al. (cited in Kizilcec, Papadopoulos & Sritanyaratana, 2014) reported improved learning outcomes as a consequence of responding to the disembodied lecture as though it is a pedagogical agent or social actor. Finally, Kizilcec et al. (2014) found that “learners who worked with pedagogical agents with a human voice and that exhibit more natural, human-like gestures, facial expression, and eye gaze performed better on knowledge transfer tests than learners working with a less humanoid agent”. I will report more fully on this phenomenon in my research shortly, enough to indicate here that PST survey responses suggest an increase in their engagement (and thus a likely increase in their learning) as a consequence of the inclusion of video in online lectures. It appears that their use mitigates many of the negative aspects often associated with online lectures (e.g. lack of connection with lecturer) with students in the Kizilcec et al. (2014) study reporting similarities between this style of lecture and actual face-to-face lectures. A common theme running through the research literature, and supported by my research, is that the video makes the lecturer “more present” to the students and that this in turn triggers a response in them where they feel more engaged with the lecturer. I will discuss this notion of “increased presence” in the findings section of this paper.

Objectives of the Study

The following questions guided the study

1. Did these PSTs prefer video of my face, and, if so, how much video did they prefer?
2. What was the impact of the use of video on their engagement with the lecturer and with the course?

Research Methodology

The data for this paper was collected via an anonymous survey of 2nd Year PSTs at three campuses of a metropolitan Australian university and was completed online and at the end of the course to avoid bias. The survey asked a number of open ended questions about the use of online lectures in the course including questions regarding how and where the lectures were watched; whether including video was preferable to just PowerPoint slides and audio; how the online lectures affected overall engagements with me and the course; and whether they preferred the online lectures with full video, part video or no video. There were 45 student responses. Ethical clearance was granted from the university for the research to take place. Students are identified only by code – e.g. PST1 through to PST45.

Results /Discussions

To establish the context of the online lecture viewing patterns of the students I have provided usage data collected by EchoCenter software (EchoCenter is the proprietary name of the lecture recording system used by the university).

<p>| Mathematics Two Cohort (n = 273) |
|-------------------------------|----------------|</p>
<table>
<thead>
<tr>
<th>Lecture</th>
<th>Unique</th>
<th>Cumulative</th>
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<tbody>
<tr>
<td>3</td>
<td>172</td>
<td>270</td>
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<td>9</td>
<td>97</td>
<td>125</td>
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</table>
A number of observations regarding the data can be made: firstly, student viewing of the lectures declines over the semester (this mirrors the pattern of reduced attendance at face to face workshops); secondly, the cumulative views (total number of views) is much greater than the unique view (count of discrete usernames) indicating that many students are viewing the lecture more than once; thirdly, the week by week view indicates that usage spiked in Week 8 (major assignment was due) and in Week 14 (exam preparation) and that the viewing pattern seems to be in pairs or groups (due to the discrepancy between individual views and cumulative views). This data is consistent with data collected over the three years that the course has been offered and the number of views was not significantly affected by the use of video within the online lectures trialed in 2015. I discuss the significance of the viewing patterns for student engagement and learning in Larkin (2016 in press).

Data from the 45 survey respondents, as well as end of semester student evaluations from the entire cohorts at the three campuses, overwhelmingly indicate a preference for video over non video lectures and clearly indicate a preference for the use of video throughout the lecture rather than just during the introduction. Student comments supporting this claim clustered around the theme of maintaining concentration and attention. Sample comments mentioned “zoning out” when just the lecture slides and audio were used – “I prefer having the video there - just the voice makes it easy to zone out” (PST40) and “I have noticed that I pay more attention to the video lectures as opposed to my zoning out on the non-video lectures. It’s not you, it’s me. I just learn better visually” (PST2).

Similar comments related to student responses to the videos - “I prefer the lectures “(with video). I immediately responded to it better, seeing a face somehow helps me concentrate” (PST15) and “Video is absolutely better. I can see your expressions and gestures and understand what you’re teaching at a deeper level” (PST3).

In both formats the total lecture length was one hour. When it comes to the length of time videos should be used student preferences are more varied. Early in the semester I trialed two formats – full length video throughout the lectures vs. a short lecture with video and a longer lecture without video. Many students preferred full-length video lectures with sample comments including “I preferred the full video to be honest. It kept me engaged the whole time” (PST27) with very similar comments from (PSTs 28, 31, 32, 38 and 42). Another PST indicated “I prefer the whole video. Having that faux sense of one on one boosts attention” (PST15) and “I prefer the full videos as it feels as though I am in a face-to-face lecture. The short introductory videos are good, however I find that I disengage from the rest of the lecture as I only have PowerPoint slides to interpret” (PST30). Other students, however, were just as adamant that the short introductory video was preferable commenting that “Complete videos seemed more distracting for me and I preferred to listen to the bulk of the content” (PST45) and “I prefer the short video followed up by the longer video as the first use of this video was to use the first part as a way to introduce the theoretical component of that instruction while the second part covered the content” (PST24).

The final comment below indicates a second benefit of no video – playing them back at 1.5 speed “Full video was sometimes hard to concentrate on both, short video was nice. I like seeing you but without the video I can speed up the lecture a little which makes it easier for me” (PST26).

The data overall indicates that students were mainly positive about the use of videos and supports the findings of Kizilic et al. (2015) who also noted a mixed response in the use of videos, (with a strong leaning to positivity). It is important to cater for all students where possible and a strong advantage of Echo Center is that the students have the option to switch the video off altogether or just switch it off for some parts of the lecture – and view the

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A second important viewing pattern that emerged from the student survey was the choice of device for lecture viewing. Prior to the survey I anticipated that many students were downloading the lectures to watch on an iPad or similar device. When the lectures are viewed on these devices the video component is not downloaded. Consequently, I did not record a video in previous iterations as I presumed it would be redundant. Contrary to my intuition, the students in this project overwhelming reported viewing the videos streamed directly to a desktop computer. Only three of the 45 students reported downloading it to a device. Given this data, in future iterations of the course, I will always provide a video component.Having established the context of the viewing, I know address, in turn, the two specific research questions underpinning this paper. 1. Did these students prefer video of my face, and, if so, how much video did they prefer?

The data from the 45 survey respondents, as well as end of semester student evaluations from the entire cohorts at the three campuses, overwhelmingly indicate a preference for video over non video lectures and clearly indicate a preference for the use of video throughout the lecture rather than just during the introduction. Student comments supporting this claim clustered around the theme of maintaining concentration and attention. Sample comments mentioned “zoning out” when just the lecture slides and audio were used – “I prefer having the video there - just the voice makes it easy to zone out” (PST40) and “I have noticed that I pay more attention to the video lectures as opposed to my zoning out on the non-video lectures. It’s not you, it’s me. I just learn better visually” (PST2).
lecture as PowerPoint slides and video, slides and audio, or video with no slides. This is also good modeling for students of catering for the differing ways students learn, a point I consider further in answering Q2.

2. What was the impact of the use of video on engagement with the lecturer and with the course?

This section of the paper looks beyond measures of viewing, and discusses the impact of the lectures on student engagement with the lecturer and the course as a result of the use of video of my face. The major impact as identified by the student survey responses related to their sense of connection with me and with the course in general. In many ways, the access to my face in the online lectures promoted a sense of connection as many students indicated that it made the online lectures more like a “traditional” face to face lecture or teaching context with a resultant increase in their commitment to the lectures. Example PST comments include “I prefer watching a lecture and seeing the person speak. It feels like they're more a part of it instead of a screen accompanied by audio” (PST38) and “I think when you see someone on video and have eye contact it demands your attention more than a voice over” (PST37). One student took this point further indicating a very personal response to the video “Sometimes it looked like you were watching me, so it made me feel bad to look away. It also, now I reflect, probably made me listen a little bit more” (PST42) whilst other comments indicated that my visual presence personalised the lecture with a resultant increase in their level of commitment “It makes the lecture less of an instructional video which is easy to lose concentration or be distracted from” (PST34) and “I prefer the video as it feel like I am at a real lecture and it feels more personal. Without the video I feel like that I don't really mean anything” (PST16). This data supports the claims made in the literature of the importance of the lecturer “being present” with the students and this is one of the reasons why I re-record the lectures each year. This re-recording is my way of demonstrating I am present with them as a cohort (using their names in the lecture / including current events) rather than just reusing lectures from previous years which would, by definition, be decontextualized for the current cohort.

It is important to note that I have not made any specific claims regarding learning outcomes as I do not have any hard data (comparative test scores or control and experimental groups) to claim improvements in learning as a result of the use of video; however, the level of engagement with the course certainly increased. Increased levels of engagement have previously been linked to improved student outcomes and I think it likely that student learning in this course has been positively affected by the use of video. Indicative student comments include “I like online lectures as I get to pause go back and reaffirm understandings confusing etc. - as a student with cognitive issues etc. it is so much better” (PST24) and “it felt as though we were having a one on one conversation about the direction of learning we were heading” (PST45) and “I understand the way you teach better when you use video. I can see your gestures and expressions to pick up on those important tips that I may not have realised as important if there had been no video” (PST2).

Contributions and Conclusion

As indicated earlier, the trend of most universities is towards an increase in the use of Web 2.0 technologies to deliver courses online. Given this observation, research such as this into the use of videos within online lectures is critical. This small pilot study found that the students overwhelming preferred to see the lecturer’s face during the online lectures and that this deepened their engagement with the course and with me and thus had a likely positive effect on their learning.

Acknowledgment (if any)

The author would like to express appreciation for the support of the School of Education and Professional Studies at Griffith University in providing funding for me to attend this conference.

References


C12

Analysis of Course Content Structure and Critical Thinking in Strategic Management

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Abstract

Previous research has suggested that content structure is important in promoting critical thinking in strategic management. In this paper, I analyze various ways to structure course content. I contend that identifying main inquiry questions; and developing models, lecture power points and checklists improve the effectiveness of the course content in promoting critical thinking.

Keywords: course content, critical thinking, inquiry questions, model, power point.

Introduction

This paper is a part of my teaching research agenda. The term teaching research is commonly used to refer to the research that specifically aims at improving teaching effectiveness (Nilson, 2010). In this paper, I analyze various ways to structure course content to promote critical thinking in strategic management (Grant, 2008).

Research Problem

In this paper, I identify and test several content structure practices that improve the effectiveness of course content in promoting critical thinking in strategic management: main inquiry questions, models, power points, and checklists. Studying these factors is important (Atwater, Kannan & Stephens, 2008; McMillan, 1987) because it improves our understanding of and the effectiveness of teaching critical thinking in strategic management. Please refer to the research model in Figure 1.

Objectives of the Study

I tested four hypotheses: (1) The inquiry questions positively associate with the effectiveness of course content in promoting critical thinking in strategic management, (2) The models positively associate with the effectiveness of course content in promoting critical thinking in strategic management, (3) The power point slides positively associate with the effectiveness of course content in promoting critical thinking in strategic management, and (4) The checklists positively associate with the effectiveness of course content in promoting critical thinking in strategic management.

Research Methodology

Data were collected from 39 graduate students taking a strategic management course in spring 2015 and 2016. The course applies the approach described. Surveys were distributed to the students in the class at the end of the semester. The students were asked to fill the surveys using Likert scale of 1 to 5 where 5 is strongly agree, 3 is neutral and 1 is strongly disagree. Except for the dependent variable, summated scales are used to measure the independent variables. I use multiple regression technique to analyze the data.

Results /Discussions

The model explains 68% of variance of overall course content in promoting critical thinking in strategic management. Two out of the four hypotheses were supported. The effectiveness of the five questions in promoting critical thinking was supported by the data. The beta is .368 (t=2.57). Similarly the power point
construct also significantly predicts the overall course content in promoting critical thinking. The beta for power point is .529 (t=3.7). Both hypotheses are significant at .01 level.

I believe that inquiry questions bound, provide a structure, and give students an overall direction of learning. This practice enhances and promotes the effectiveness of teaching and learning critical thinking. More than the general inquiry questions, power points provide detail, summarize, integrate and explain the questions and their relationships. I also use relevant examples in the slides in order to promote learning (Svinicki, 2004). Collectively the inquiry questions and power points provide students with the direction and information as well as explanation and integration of the course content that promotes their critical thinking.

Researchers have found that our brains store, process and retrieve knowledge as coherent and interconnected parts, not as a collection of information (Bransford, Brown, & Cocking, 1999; Svinicki, 2004). Thus, developing models is an essential human learning mechanism (Weick, 1979). Without such structuring students will fail to understand and recall what they have learned.

However, data collected did not support the hypothesis. I believe that the data were simply suggesting that the practice of teaching using models in the two classes were not effective. It might suggest that teaching critical thinking using model requires skill and time.

**Contributions of the study**

The results suggest the importance of using main inquiry questions and power points in promoting critical thinking. This study extends the literature on teaching critical thinking in strategic management. It also provides some practice implications. First, this study provides empirical support for adopting the practice of developing main inquiry questions and power point slides.

One goal of this study is to learn and improve my teaching effectiveness. The data suggest that I was not effective enough in using models and checklists in promoting teaching and learning critical thinking in strategic management.

**Conclusions**

In this paper, I analyze various ways to structure course content. I contend that identifying main inquiry questions; and developing models, lecture power points and checklists improve the effectiveness of the course content in promoting critical thinking. The hypotheses related to inquiry questions and power point slides were supported while hypotheses related to model and checklist were not supported.

**Figures/Display Elements**

Example below.

![Research Model](Figure 1. Research Model)
References


C13

Governance Practices and Disclosure by Not-for-Profit Organisations: Effect on Individual Donating Decision

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Abstract

This study aims to (1) examine how individual donating decision could be affected by demographic factors; and (2) determine perception of public towards governance disclosure practiced by non-profit organizations in Malaysia. This study uses positivist approach and survey instrument to amass data. Using snowballing and simple random sampling, this study manages to secure a sample of 255 respondents. SPSS ANOVA, Product moment correlation and multiple regressions are used to generate results for the testable propositions. The results for Pearson moment correlation of governance practices and disclosure are statistically significant (p<0.01). Gender is the only influencer that revealed differences between groups in respect of donating decision. The findings also show that information disclosure about governance (β=0.288, p<0.001), background (β=0.199, p=0.003) and performance (β=0.210, p<0.000 with the exception of finance (β=0.078, p>0.001) are strong predictors of individual donating decision. The insight of this study offers senior officials and decision makers of not-for-profits and charity organisations the essence of governance practices disclosure, revealing sufficient background and performance information for potential donors to make informed decisions. In spite of the popularity of the governance research over the years, this study is one of the novel investigations using not-for-profit organizations in relation to the proclivity for individual giving intention, the results of which could be applicable to emerging markets.

Keywords: Governance practices, information disclosure, non-profit organisations, individual donating decision, Malaysia

Introduction

Non-profit organizations sometimes referred to as “third sector”, has gaining more prominence in recent years in the fields of social well-being provision, education, community, international relations, environment, culture, health, arts and so forth (Noorbijan et al., 2014). Definitions of non-profit organization abound, for instance, Letts et al. (1999) defines non-profit organization as organization that often undertake certain form of charity work and public benefits and most organizations rely raised funding from public, corporate or private philanthropy and government grant. Over the last decade, media attention to non-profit organization sector scandals has increased which came to discussion about regulation, self-regulation and transparency. One of which involved conviction of William Aramony, president of the United Way of America who was found guilty for defrauding the organization of more than $1million (McFadden, 2011) and Kids Wish Network (United States) was found diverted fundraising money to enrich charity’s operator and founder’s company (Hundley and Taggart, 2013). However, these scandals often not as highly publicized as other for-profit corporations because there are no shareholders claiming about their lost. In Malaysia, relevant authorities such as Commission of Companies Malaysia (CCM) and Registrar of Society (ROS) have put great efforts in implementing various monitoring mechanism and enforcement programs due to more and more donors pay attention on the accountability and availability information of non-profit organizations that they are supported.

Research Problem

In Malaysia, there are 57,570 registered organizations with the ROS as at March 2016 (Malaysia’s Open Data Portal) and 2,040 CLBG registered by the CCM as at June 2016 (Companies Commission of Malaysia Portal). By looking at the statistics of organizations registered with ROS, the trend is increasing year-on-year since 2013 until 2015 which is 8,034, 8,259 and 10,307 respectively (Registry of Society Portal). The rapid increasing of registered non-profit organizations has made accountability issue of the third sector a major concern of the donors (Tamilchelvi and Ramachandran, 2015). In developed countries, non-profit sector is getting better
structure and properly regulated with code of corporate governance for non-profit organizations (Othman and Ali, 2014; Tamilchelvi and Ramachandran, 2015). However, in developing countries like Malaysia, there is no specific accounting standard for non-profit organizations (except CLBG) to follow though they are encourage to comply with the International Financial Reporting Standards adopted by Malaysian Financial Reporting Standards (Arshad et al, 2013). Moreover, it is not mandatory to have code of corporate governance for non-profit organizations to support their fiduciary work towards the best practices in governance. Thus, overall disclosure and reporting system of non-profit organizations in Malaysia only comply with minimum regulatory requirement.

CCM and ROS have taken few initiatives and measures to promote transparency, accountability, and integrity of non-profit organizations. For instance, CCM conducts Corporate Directors Training Programs and Annual Dialogue Sessions between directors and the CCM. ROS conducts introductory courses on the management and financial management to newly registered societies, and distributes pamphlets and brochures relating to good society management. In terms of regulation, non-profit organizations registered with ROS are required to submit Form 9 in pursuant to Section 14 (1) Societies Act 1966 which consisting of the Receipts and Payments Statement and Balance Sheet for the financial year, within sixty days after holding its annual general meeting. For CLBG, under the virtue of Section 165(5) Companies Act 1965, companies have to lodge annual return (as per Form 55 and including audited financial account) within one month after the annual general meeting. Section 167 of the Companies Act 1965 further stipulates that CLBG have to maintain company’s account and other records for seven years but no such obligation for organizations registered with the ROS.

Due to non-profit organizations in Malaysia can be formed from multiple registration options and are regulated under various law, this may give rise to no standard reporting system, no standard requirement for keeping accounts, and lack of transparency to make information for public view (Rezy, 2014). The absence of standardized requirement indicates that there is lack of information available pertaining non-profit organization such as programmes, board of directors and management team as well as the use of funding from public monies or shareholder funds (Othman and Ali, 2014). Thus, it is important for Malaysia non-profit sector to develop a standardized best practice such as code of corporate governance for non-profit sector to increase transparency and trustworthiness.

Three research questions have been identified based on the associated hypotheses in the study:
1. How demographic factors influences individual donating decision?
2. How much information disclosure do public expect from non-profit organization?
3. What criteria do public use when selecting non-profit organization to support?

Objectives of the Study

The objectives of this study is to (1) examine how demographic factors affect individual donating decision; and (2) understand perception of public towards governance disclosure practiced by non-profit organizations in Malaysia which would affect their donating decision.

Research Methodology

This research was conducted using quantitative method. The researcher chose a correlation design to describe the characteristic of the independent variables, which were extend of background, financial, performance and governance information that effect on the dependent variable, the individual donating decision. Using the correlation method, the relationship between the independent variables and dependent variable can be ascertained. The researcher also used descriptive method to provide information regarding the characteristics of the respondent such as gender, level of education, age, monthly income and religion.

Simple random sampling and snowball sampling were used in this study to choose respondents answer the questionnaire survey form. In this study, snowball sampling was chosen because the respondents may have close social network to refer the researcher other people that could potentially contribute to the study. Questionnaire was adapted from relevant prior studies by Jos and Ton (2008), Robin and Sharon (2010), Zainol et.al. (2011), Abd et.al. (2015) and Haski-Leventhal and Foot (2016). The instrument was divided into four parts consisting of performance, background, governance and financial disclosure. In this study, a total of 265 questionnaires have been distributed to public in three major geographical areas. A total of 265 questionnaires were distributed to the public via online or hands-out in hardcopy methods. From the 265 questionnaires, 255 are found complete and
Results and Discussion

The main results of this study can be summarised as follows:

- Product moment correlations for all the constructs under study are statistically significant with p value less than 0.001.

- Standard multiple regression results shows that all beta values for governance, background and performance information disclosure are also bearing p<0.01

- t-test result reveals that there is a difference between male and female in terms of donating decision.

- ANOVA results indicated that there is no differences in donating decision with regard to demographic factors such as education level, age, monthly income and religion. This test was not significant and hence the testable proposition was not accepted.

To answer the first and second research questions, correlation and standard multiple regression analysis were used to verify the hypothesis depicted. There was a significant relationship between background information disclosures with individual donating decision (p < 0.01). Finding also showed that background information was one of the predictors of individual donating decision (p < 0.05). The results ran parallel to the research found by Bennet and Savani, 2003; Zainon et al., 2011; Abd et al., 2015. Invariably, most respondents concerned the nature of services and information availability provided by non-profit organizations before donating decision. However, validity of registered address of non-profit organizations exerted less meaning towards basic information required by donors. Registered address was not an important consideration in donating decision.

In addition, there was significant relationship between financial information disclosure with individual donating decision (p < 0.01). However, financial information did not contribute to the prediction of donating decision (p > 0.05). The result of this analysis supported the research of Conolly and Hyndman (2013) and Haski-Leventhal and Foot (2016) that individual donors did not incorporate financial information into their donating decision. It also suggested that respondents were less likely to be sceptical of how the non-profit organizations manage its financial nuances. As opposed to institutional donors, individual donors were less accessible to financial statement or annual reports and their lack of financial knowledge (Connolly and Hyndman, 2013). The view of Othman and Ali (2014) also provided evidence that tightening financial reporting practice could let donors have a better picture of donations which eventually encourage trust and confidence towards the organizations. The mixed results of the past clearly denote that financial information disclosure might not be a good predictor of the donating decision.

Performance information disclosure exerted significant relationship with individual donating decision (p < 0.01). At the same time, performance information disclosure was found to be one of the predictors influencing individual donating decision (p < 0.05). This findings was in alignment with previous studies emphasizing the importance of performance information disclosure on donation decision (Buchheit and Parsons, 2006; Jos and Ton, 2008; Bekkers and Wiepking, 2010). From the results, verified certification of non-profit organization gave the most impact on individual donating decision followed by the way of reporting activity, participation in special projects as well as details of programmes and services. It was learned that many syndicate corporations nowadays misused the nature of non-profit organization to seek for profit through fundraising activities (Yeo and Linette, 2013).

Our analyses also revealed that there was significant relationship between governance information disclosure with individual donating decision (p < 0.01). Governance information was also found to contribute to the prediction of individual donating decision (p < 0.05). Generally, governance information disclosure was considered useful to donors to understand the content and adequacy of non-profit organizations (Zainon et al., 2011). Specifically, the result indicated individual donors were more concern on the involvement of organization in community services and contactable person. However, respondents’ donating decision was not influenced by the board size and list of management team as postulated by Hyndman and McDonnell (2009) and Haski-Leventhal and Foot (2016).
The first research question was answered through the output of independent T-test and One-Way ANOVA. Gender showed significant difference in individual donating decision. This result was consistent with the previous researches which revealed that female donors tended to donate more frequently that male (Eckel and Grossman, 2000; Roberts and Roberts, 2012; Dvorak and Toubman, 2013). However, there was no significant difference between other demographic factors such as age, education, income and religion on individual donating decision. The insignificant results of other factors could be attributed to several probable reasons, one of which clearly associated with the inclination of individuals to donate varied on different regions (Schlegelmilch et al., 1997; Lwin et al., 2013; Yao, 2015; Abd et al., 2015). Individuals influence by the culture and lifestyle of different regions would perceive the satisfaction of donation differently. Another possible reason was that individual would examine types of activities engaged by non-profit organization rather than evaluating the sector itself (Handy and Kats, 2008). The depth of individual’s knowledge and familiarity with the organizations play important roles in individual assumption towards the non-profit sector generally. Since there are numerous non-profit organizations available in Malaysia, this gives rise to the diverse effect of public perception toward the sector.

Hence, the supply of enough relevant information to public exerts positive impacts on non-profit organizations. People are relatively held more favourable attitudes towards the organization than others and are more likely to donate. Table 7 below summarize all results of this study.

**Contributions of the study**

Evidence shows that all demographic factors with the exception of gender have no effect on giving decision made by individuals. This suggests that Malaysia non-profit organizations which target on individual donors should inculcate the public based on other aspects, perhaps non-cash contributions such as services and voluntary activities and campaigns irrespective of age, educational attainment, income and religious background.

Contradict to the past researches (Simaens and Koster, 2013; van der Heiden, 2013; Othman and Ali, 2014); our findings suggest that individual seems to be oblivious of non-disclosure of financial information. This probably could be due to the amount they donate especially the Gen Y donors whose monthly income are relatively low compared to their senior counterparts. However, this study reveals that higher information disclosure practices covering background, performance and governance would likely to generate more financial return as donors will incorporate these types of information into their donating decisions. In this regard, senior officials and decision makers of non-profit organizations or institutions should exercise cautions to ensure sufficient background, performance and governance information be made available through various means, mechanism and platforms (e.g. website, social media) to attract more potential donors or philanthropists, especially senior giving donors, as part of their revenue drive for sustainability.

Non-profit organizations will have to be proactive to disclose information that may be influential to individual donating decision. Better outcomes can be achieved if disclosure practice becomes more transparent with organizations’ process. Recognising and understanding the public perception towards information disclosure is important for non-profit organizations to design an effective management framework for the purpose of maintaining sustainable relationship with public. In this respect, Othman and Ali (2014) also admonished that government and relevant authorities also play an important role in regulatory framework which aims to govern non-profit organizations for better accountability and transparency. For instance, the Government of Singapore is improving the awareness of good governance among its non-profit organizations through various events and initiatives (Tamilchelvi and Ramachandran, 2015). From the Malaysian context, there is still room for improvement in regulating governance of non-profit organizations to a greater extent. Only continuous research on governance from the donor’s point of view could contribute to more comprehensive information disclosures that would benefit not just the donors but other group of stakeholders.

**Conclusions**

The outcome of the research framework offers a new insight regarding individual expectations of information from non-profit organization practices. The findings indicate that, except for gender, there is no significant difference between age, education, income and religion on donating decision although previous research showed their potential relevancy. By evaluating types of information required by public, our findings suggest that individual donors are more concerned on background, performance and governance information. Interestingly, financial information disclosure is not part of criterion in selecting non-profit organization to donate. Keeping
public informed especially donors should be considered as ethical duty of all non-profit organizations. Hence, it is crucial to know what kind of information would motivate individual donors to make decisions about giving and what aspects would be perceived favourably.

References


Online Distance Learning: Ensuring Equivalency of Experience

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Abstract

Online distance learning is still in its infancy, but has developed to a point where a body of literature and experience is informing its enhancement as a ubiquitous contemporary learning mode. New media and modes of delivery demand the adoption of new methods and processes for engaging and motivating students in the quest to ensure the quality of the learning experience, and parity of expectation with other, more conventional modes. Deeply embedded processes equivalent to those used to evaluate the perceptions of campus-based students have been under-represented within online distance learning and, in the absence of the regular and ongoing interactions that occur formally and informally with those on campus, relatively little dialogue typically takes place of a kind that motivates the student to maintain momentum and application in their studies.

This paper discusses a project, Learning Expectations, introduced by the Robert Gordon University, which was aimed at re-appraising pedagogic approaches to online learning borne out of student and staff perceptions of weakness in the online distance learning experience. Central to this was a comprehensive re-evaluation of the pedagogic design, founded on the principles of constructivism, which aimed to stimulate student engagement and peer interaction from those in remote, disparate locations. The results were transformative, and it is suggested that aspects of the project have broader relevance and application to the education sector.

Keywords: engagement; equity; online learning; student experience

Introduction

Although the Robert Gordon University has been involved in the delivery of online distance learning (ODL) for over a decade, it is only relatively recently that the focus of attention has been placed on developing a deeper understanding of the learning experience as perceived by students. In 2012, the Robert Gordon University introduced ‘Learning Expectations’, a project aimed at ensuring that the quality of the student experience for online distance learners has parity with that of their campus-based peers, and that the experience has a coherence and integrity in its own right. As a developmental initiative, the project sought to respond to perceptions voiced by some distance learning students that there were inconsistencies in course delivery and a perceived lack of coherence in the way that online delivery was presented or structured. There is generally a need for a better understanding of learning design and support using online technologies (Knight, 2009, p6) and, arguably, the need for this kind of development is somewhat predictable as the mode matures and understanding develops. Equally, as identified by Beetham (2008), working in an online mode causes some teachers to make explicit many aspects of their practice that would emerge ad-hoc in a live learning and teaching environment, and this can present a challenge.

It is easy to under-estimate the degree of difference between the experience of traditional face-to-face interaction, and that of a distance learner in another part of the world, whose interactions with staff or peers occur solely via a computer. After all, campus-based delivery has evolved over hundreds of years whilst online distance learning is in its youth.

University level

As a means of consistently developing practice institutionally, two levels of enhancement activity were identified; ‘Learning Expectations Core’ and ‘Learning Expectations Plus’. The ‘Core’ level was concerned with establishing a norm for ODL provision at the university, while the ‘Plus’ level defined good practice in ways that could be applied and contextualised across the breadth of the course portfolio.
Scott Sutherland School of Architecture & Built Environment

The school offers a small portfolio of online distance learning courses although, in the case of the MSc Construction Management, the cohort is of substantial size, with a cohort located in 29 countries around the world. Moreover, all students are undertaking their studies whilst in employment in industry. A couple of challenges arise as a direct consequence of this; firstly, information requires to be clear and readily accessible as student time is in short supply and; there are many pressures on students that can serve as a distraction or cause disengagement if the learning experience is too remote, or communication sporadic. Such difficulties had emerged in the early cycles of course delivery, with low levels of student engagement with the materials provided leading to skewed understandings of learning expectations, including the necessary time commitment. Reflection on experience suggested that it was the issue of student engagement that was the key to transforming perceptions, and significantly enhancing academic quality.

At a school level, the application of Learning Expectations sought to improve student engagement through non-traditional methods, i.e. by reviewing the learning process without reference to campus-based modes. Improving student understanding of the learning process was regarded as being pivotal in improving engagement, and in increasing the sense of learner independence. The theoretical framework of constructivism underpinned this developmental work, providing a learning structure through which the student could assemble and structure information, relating it to knowledge that is already familiar (Nicol and Pilling, 2000). In addition, reference was made to Chickering & Gamson’s seminal paper on principles of good practice in education (1987), which identifies core tenets such as good staff-student communication, peer interaction, active learning methods, and timely feedback.

Techniques adopted to improve engagement included planned programmes of regular interaction, a review and adjustment of the pace of learning, and the enhancement of forums as a means of enhancing peer interaction and learning. The latter is particularly important given the diverse and significant expertise and experience existing amongst the student cohort itself.

Rethinking course delivery and assessment from first principles resulted in a radical transformation of the learning process from a tutor-centric to a student-centric process. This comprised a number of key stages:

Stage 1: the information made available to students was restructured, and material added that made explicit not only how delivery would take place, but why it has been designed that way. In other words, the underlying pedagogy was made explicit. Key themes were colour coded so that when a student sees text in green, for example, he/she understands that it relates to assessment and feedback, etc.

Stage 2: the assessment process was reviewed in tandem with reconsideration of the planned use of the forum. Analysis had revealed that the fact that forum use had not originally been assessed meant that students had no motivation to engage, and were therefore operating in effective isolation. The solution to transforming this lay in the redesign of forum activity, with each weekly intervention constituting a formative assessment. The overall cohort was divided into groups with a maximum size of 7 students, and a process introduced in which students were required to contribute ideas and opinion on topics, as well as to evaluate the academic contribution of their peers. Formative assessment weighted each of these elements equally, and within the space of one semester the format had reinvigorated the forum to a level where interaction involved the continuous volunteering of experience and thinking.

Stage 3: the accompanying communication and support strategy was redeveloped to create a single point of contact for consistency of service, and to develop student initiative and active learning through directing them to resources where answers to questions may be found.

Implications for staff

The project represented a significant change management exercise, both in terms of conveying new expectations and processes to the students, and in re-calibrating the teaching process for (often entrenched) tutors.

For staff whose practices have developed using face-to-face techniques, the development of a learning process undertaken exclusively via digital technologies can present a considerable challenge. This relates both to skill and, perhaps more significantly, to personal confidence in re-conceptualising educational strategies, borne out of a deep understanding of underpinning pedagogy. Indeed the phenomena encountered resonate strongly with the broader challenges relating to the shift in the role of academic staff from providers of learning to producers of
learning (Skolnik in Thorne, 1998). As a result, a parallel programme of staff development workshops was organised, aimed at developing understanding of the supporting pedagogy.

**Research Problem**

The purpose of the work, which took the form of an action research project, was to improve the engagement, and hence quality of experience for online distance learners, through a developed understanding of the student behaviours, expectations, and perceptions.

**Objectives of the Study**

In service of the overarching aim, the *Learning Expectations* project had two primary objectives as follows:

- To form a consistent approach to explaining the "how" of learning, teaching and assessment, from a learner perspective, using coherent presentational formats on the University’s online platform, ‘CampusMoodle’, and,
- To provide a clear, structured template for staff to follow that addresses student perceptions of variability in the clarity or quality of materials and guidance.

**Research Methodology**

As the intent was to enhance the student experience through course delivery and assessment, the project took the form of an action research study. A recognized attribute of action research is its ability to generate solutions based on participatory processes (McAteer, 2013) and, in this sense the methodology itself also corresponded to the precepts of constructivism.

The methodology adopted a process of triangulation to give reasonable validity and reliability to the research findings (Cohen & Manion, 1986). Specifically this included gathering qualitative data from a range of students regarding their perception of their learning experience, observations from academic staff, and data relating to actual student engagement patterns.

The initial analysis that led to the project being instigated was undertaken based on course level statistics generated by the university. However, once initial enhancements had been designed and a pilot exercise implemented, data was gathered from the students using questionnaires. A second qualitative data gathering exercise was undertaken on completion of the pilot using the same questions and involving the entire student cohort, enabling shifts in student perception to be measured. Responses were thematically coded enabling qualitative data to be categorized in the process of analysis.

**Results /Discussions**

While early iterations of student fora fundamentally assumed the model of the on-campus seminar in which ‘ownership’ and control of the session resides with the teacher, the revised format handed ownership to the students, inviting the free exchange of ideas. Hence the nature of tutor interaction shifted from control and conversational orchestration, in which the student waits for the tutor’s lead, to overview and periodic intervention with the discussion typically instigated by the students themselves.

Analysis of early iterations of the course demonstrated that the online forum, whilst available as a tool, was heavily under-utilised. Further investigation revealed that students had not been motivated to capitalise on the facility as related activity formed no part of any assessment process. The consequence was that the very element that had been conceived as the focus of learning, harnessing group dynamics and peer interaction, was being overlooked. The further consequence of this was that the students were only responding to the directions of the tutor.

Following the re-conceptualisation of the learning process to align with constructivist principles, the expectation of the students was that they would engage collaboratively, and that this collaboration would form the basis of the formative assessment regime.

A difficulty in the change management process was the need to implement the new regime concurrently with students learning. Based on the lack of forum activity under the original format, initial feedback on the increased pace of delivery and expectation of contribution was critical, principally because students used to completing
one assessment component per semester, were now required to undertake formative assessment on a weekly basis. However, it quickly became evident that the cohort realised it was deriving enormous benefit from the peer interaction of the fórum, which had taken on a social médium role within an academic context, giving vitality and a sense of community to the experience. Perceptions of value, enjoyment, and feedback were all significantly more positive, with a number of students wishing to perpetuate the fórum beyond course or module-related activity. Notably, the random construction of fórum groups without the more detailed knowledge of the individual as normally acquired on campus, removed the Darwinian tendency of campus-based learners to seek out academically stronger, or more motivated students whom they recognise as offering benefit to their individual progress (McClean & Hourigan, 2013). There is no evidence to show that this impacted detrimentally on engagement, perhaps suggesting that the attitude of the distance learner regarding their peer-group may be different.

The Project outcome aligns strongly with Astin’s (1995) assertion that students are most likely to derive optimum benefit from their education if they are ‘meaningfully and psychologically involved’ in the learning experience (Rautupurp and Vaisenen, 2001, p.2). Hence the changes were found to have been an effective means of inculcating a sense of active learning, and reducing the tendency to disengage where gaps between tasks are longer.

Contributions of the study

This study highlights the importance of adopting bespoke strategies for delivery to online distance learning students, as distinct from those employed for campus-based courses. Moreover, it demonstrates the necessity of student-centric approaches as a means of stimulating authentic engagement with the learning process.

The role that assessment plays in student motivation is widely documented. Although the notion of assessment becoming the ‘stick’ to motivate students is one of debate, the experience from this project shows that the fact that contributions are assessed can rapidly become eclipsed by other values that students attribute to high quality interactions.

Conclusions

New modes of delivery demand new pedagogic approaches, and where staff are acculturated into a dominant range of teaching methods, risks arise from attempts to translate these across modes. This project highlights the importance of developing methods and materials from first principles, based on a firm understanding of the underlying pedagogy. Moreover, it demonstrates the value of developing a student learning of how and why they learn in particular ways. Student engagement is critical to any form of active learning, but arguably no more so than in online distance learning where the absence of a desire to interact and participate renders the student completely isolated and hence impoverished. The role of formative assessment, coupled with a carefully planned and paced programme of interactions, is illustrated here as a catalyst for a level of peer interaction that fuels the online forum as the key learning vehicle through the sharing of experience and opinion.

References

Examination of the Cross Disciplinary Connection and Cross Disciplinary Integration of ESL and Music Pedagogies

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Abstract

The purpose of this study was to examine the pedagogies of English as a second language (ESL) and music for cross disciplinary connection and cross disciplinary integration. The purpose of this study was to examine the pedagogies of English as a second language (ESL) and music for cross disciplinary connection and cross disciplinary integration. The purpose of this study was to examine the pedagogies of English as a second language (ESL) and music for cross disciplinary connection and cross disciplinary integration. The purpose of this study was to examine the pedagogies of English as a second language (ESL) and music for cross disciplinary connection and cross disciplinary integration.

Keywords: ESL, ELL, Music, Rhythm, Orff, Supra-segmental

Introduction

The similarities between language and music are remarkable. The practice of language and music are both universal human behaviors present throughout history and culture. Both are processes in time with rhythmic and expresssive devices such as tempo, intensity, intonation and formal structure. Noting these similarities, the purpose of this study was to examine the pedagogies of English as a second language (ESL) and music for cross disciplinary connection and cross disciplinary integration. ‘Cross disciplinary connection’ is defined as two distinct disciplines utilizing similar pedagogies, and ‘cross disciplinary integration’ is defined as two disciplines that are authentically merged in the curriculum sharing instructional time with objectives and learning outcomes for each discipline.

Research Problem

The scope of this study focused on one selected problem from ESL pedagogy, and one selected problem from music pedagogy. The problem from ESL pedagogy focused on the mastery of supra-segmental pronunciation. According to Crystal (1980), and Avery & Ehrlich (1992), traditional ESL pedagogy has emphasized segmental pronunciation at the neglect of the supra-segmental pronunciation. The term ‘segmental’ pronunciation is defined as the pronunciation of individual words. ‘Supra-segmental’ pronunciation is defined as the pronunciation of words sequenced together in phrases or sentences. Avery & Ehrlich (1992) asserted that fluent and intelligible speech is possible only when students achieve the ‘rhythm’ of English through mastery of supra-segmental pronunciation. The problem many English language learners (ELL) experience with English supra-segmentals is that English is a stressed-timed language whereas most Asian languages such as Chinese, and romance languages such as Spanish are syllable-timed languages. The definition of a ‘syllable-timed’ language is when each syllable receives the same approximate amount of time across the sentence regardless of the relative stress of the syllable (Example One). In ‘stress-timed’ languages like English, stressed syllables form regular beat patterns across the sentence while unstressed syllables fall between the beats (Example Two). Typically main content words such as nouns and verbs form beats while function words such as articles and auxiliaries fall between the beats. Learners whose primary language is syllable-stressed have a tendency to impose their native pattern of pronunciation onto English resulting in unintelligible patterns of pronunciation.

The selected problem from music pedagogy focused on rhythmic literacy. ‘Rhythmic literacy’ is defined as ability to read and perform notated musical rhythm accurately with appropriate musical stress. Noted music pedagogues such as Gamba (2016) and Strouse (2007) identified rhythmic literacy as the foremost challenge
toward achieving thorough musical expression. The problem of rhythmic literacy was chosen because of its pedagogical similarity to the correct stress-timed pronunciation of English. Cole (2008) grouped rhythmic literacy methods into three broad categories: 1) numeric counting, 2) non-sensible syllables and 3) sensible syllables (Examples Three, Four and Five respectively). This study only considered the sensible syllable rhythmic literacy method because of its close approximation to supra-segmental pronunciation in English.

Objectives of the Study

The objectives of the study were to examine the literature of ESL and music for cross disciplinary connection and practice of cross disciplinary integration, and to formulate conclusions and recommendations for research.

Research Methodology

The following research questions were formulated to guide the examination of literature of ESL and music pedagogies for cross disciplinary connections and integrative practice.

Research Question One: What current trends in ESL pedagogy incorporate musical rhythm to enhance supra-segmental pronunciation?

Research Question Two: What current trends in music pedagogy incorporate language to enhance rhythmic literacy?

Research Question Three: What trends exists that specifically teach supra-segmental pronunciation and rhythmic literacy in an integrative context?

A literature search was made through the Education Resource Information Center (ERIC) and the Institute of Education Sciences (IES), an exhaustive repository of research studies and journal articles provided by the US Department of Education. Key search words including “ESL, English as a second language, ELL, speech, music, rhythm, supra-segmental, and Orff” were used in various combinations to access relevant and pertinent studies and reports in the area of ESL and music education. Search results were organized and discussed around each research question.

Results/Discussion of Research Question One:

The examination of literature in ESL pedagogy demonstrated notable trends toward using rhythmic concepts to teach ESL. Chen, Fan & Lin (1999) observed successful outcomes by using the prosodic structure of simple songs and nursery rhymes to teach English to Chinese students. Their use of prosodic structure exactly equated to musical meter that generalized to spoken English (Example Six). Chela-Flores (2001) proposed an adaptive Kodály rhythmic approach for teaching supra-segmental pronunciation using the syllables TA and ti. The Kodály syllables formed templates for guiding pronunciation (Example Seven). Gilbert (2010) observed that correct supra-segmental pronunciation is not only rhythmic, but melodic as well. Her system of supra-segmental pedagogy used visuals that approximate both rhythm and melodic inflection (Example Eight).

Recent empirical research validated the trend of ESL professionals seeking to incorporate musical rhythmic concepts. Taub, McGraw & Keith (2007) studied the effect of reading English against a rhythmic beat. The effect of supra-segmental performance accompanied by rhythmic beat compared with unaccompanied reading was significant \( F(1,76) = 107.37, p<.0001 \). Trofimovich & Baker (2006) studied the effect of practice with prosodic stress on supra-segmental pronunciation among Korean ELLs. The effect of prosodic practice on the outcome of pronunciation was significant \( F(1,36) = 62.08, p<0001 \). Jackson & O’Brien (2011) studied the effect of prosodic stress timing on intended meaning with stress timed language among L2 students. The effect of pause (rhythmic rest) on intended meaning was significant \( t(11) = 2.65, p = .023 \). These selected studies were highly representative and congruous of the larger body of literature in ESL pedagogy indicating a substantial reliance on musical rhythm.

Results/Discussion of Research Question Two:

The examination of music pedagogy demonstrated notable trends toward using language to teach rhythmic literacy. Suzuki (2007) prominently relied on language to guide rhythm with young children while use of speech is collectively accepted among Suzuki teachers (Example Nine). According to Gilpatrick (2009) essential Orff
pedagogy focuses upon harnessing innate behaviors of children, and molding these behaviors into specific musical behaviors such as singing, playing instruments, improvising. Orff observed that there was an integral connection between musical rhythm and language, and that children naturally merge rhythm and language via nursery rhymes, spontaneous playground chants and patty-cake games. The essence of Orff rhythmic training is to build on the prosodic nature of nursery rhymes and poetry to form a template for musical rhythm (Example Ten).

Empirical research validated the trend of music educators seeking to incorporate language concepts to enhance rhythmic literacy. Bebeau (1982) studied the effect of language on rhythm performance with children. The effect of Orff rhythm training on performance of rhythm was significantly superior over numeric counting \(t(56) = 2.03, p < .05\). Colley (1987) studied the use of language on rhythm performance with children, and determined the effect of Orff rhythm training on performance of rhythm was significantly superior over all other methods \(F(3, 156) = 44, p < .0001\). The Colley study appeared to be definitive establishing the efficacy of language on rhythm performance. These selected studies were highly representative and congruous of the larger body of music pedagogy literature indicating substantial reliance upon language to teach rhythmic literacy.

Results/Discussion of Research Question Three:

An exhaustive search of the ERIC data base using the prescribed search words discovered no cross disciplinary studies that overtly or intentionally sought to teach supra-segmental pronunciation and rhythmic literacy in a cross disciplinary integrative context. This result was unexpected considering the similarities of the pedagogies.

Contributions of the Study

The results of this study have established a definite cross disciplinary connection between the pedagogy of ESL and music. Clearly ESL professionals use rhythm to teach language and music educators use language to teach rhythm. The cross disciplinary integration of ESL and music, however, has not been investigated. Presumably ESL professionals only test the efficacy of rhythm in relation to language outcomes. Conversely, music educators only test the efficacy of language in relation to musical rhythmic outcomes. Hence, research within each discipline is compartmentalized. Compartmentalization may exist for several reasons. First, professionals in either discipline may not have interest in cross disciplinary outcomes. Further, professionals in either discipline may not possess enough expertise in the other discipline to conduct research in a cross disciplinary integrative context.

Conclusions

Since the results demonstrated an unequivocal cross disciplinary connection between ESL and music, and absence of cross disciplinary integration, further investigation is warranted. This study will be followed by an ensuing study investigating the efficacy of cross disciplinary integration. General research design will feature:

1) Randomizing ESL students into two L1 groups of equal age/grade level.
2) Measuring supra-segmental and rhythmic literacy skills of students with pretest.
3) Instructing Group 1 in both supra-segmental pronunciation and musical rhythm apart from one another in traditional compartmental isolation.
4) Instructing the Group 2 in an authentically merged curriculum sharing instructional time using Orff pedagogy with objectives and learning outcomes for both segmental pronunciation and musical rhythm.
5) Measuring gains of supra-segmental and rhythmic skills with posttest.
6) Analyzing posttest gains for levels of significance between groups.
7) Discussing and disseminating results.

Display of Examples

EXAMPLE ONE: Syllable-timed Rhythm

\[
\text{Je- re- mi- ah lives in a big brick house.}
\]
EXAMPLE TWO: Stress-timed Rhythm

Je - re - mi - ah lives in a big brick house.

EXAMPLE THREE: Numeric Counting

1 & 2 & 3 & 4 1 da 2 & 3 (4)

EXAMPLE FOUR: Non-sensible Syllables

Ti Ti Ti Ti Ti Ti Ta Ti te Ti Ti Ta

EXAMPLE FIVE: Sensible Syllables/Orff

Welcome to the Eng - lish class. Let's be - gin the work.

EXAMPLE SIX: “Twinkle, Twinkle Little Star”

<table>
<thead>
<tr>
<th>Rhyme</th>
<th>TWIN-HOW</th>
<th>-kle</th>
<th>TWIN-WON-</th>
<th>-kle-der</th>
<th>LIT-WHAT</th>
<th>-tle</th>
<th>STAR</th>
<th>ARE,</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter</td>
<td>/</td>
<td>o</td>
<td>/</td>
<td>/</td>
<td>/</td>
<td>/</td>
<td>/</td>
<td></td>
</tr>
<tr>
<td>Speech</td>
<td>When</td>
<td>does</td>
<td>Ja-cob</td>
<td>go</td>
<td>to</td>
<td>school?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speech</td>
<td>Tell</td>
<td>me</td>
<td>how</td>
<td>to</td>
<td>get</td>
<td>to</td>
<td>town.</td>
<td></td>
</tr>
</tbody>
</table>

EXAMPLE SEVEN: Patterns of Kodály Syllables

<table>
<thead>
<tr>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>Meter</td>
<td>/</td>
<td>o</td>
<td>/</td>
</tr>
<tr>
<td>Speech</td>
<td>What’s your name?</td>
<td>I want to go to town.</td>
<td>When is the time?</td>
</tr>
<tr>
<td>Speech</td>
<td>Maggie Sloan</td>
<td>I never get to go.</td>
<td>Hurry downstairs</td>
</tr>
</tbody>
</table>

EXAMPLE EIGHT: Rhythmic/Melodic Visuals

<table>
<thead>
<tr>
<th>Interrogative Inflection</th>
<th>Did you say we should go?</th>
</tr>
</thead>
</table>
|                         | o | o | o | /

<table>
<thead>
<tr>
<th>Declarative Inflection</th>
<th>I said we should go.</th>
</tr>
</thead>
</table>
|                        | o | o | /

EXAMPLE NINE: Suzuki Rhythmic Illustration

EXAMPLE TEN: Orff Rhythmic Illustration


tree

tree

tree

tree

tree

Old King Cole was a merry old soul.

References

Board Games in Forming of Students’ Entrepreneurial Orientation

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ABSTRACT

BOARD GAMES have a huge potential as an active learning tool to be used in teaching particularly in the field of entrepreneurship. Board games can cultivate the experiential learning among the students by allowing them to “learn by playing (doing)”. Despite the popularity of board games with people of all ages, research is still scarce in the area relating to how board games affect learning. The purpose of this paper is to examine the students’ perceived effectiveness of playing board game in understanding Entrepreneurial Orientation (EO). Questionnaire was given to 60 participants to respond to a series of items on EO in Likert scale. Key finding includes that the students perceive board game was more effective in understanding EO compared to lecture.

Keywords: Board Game, Experiential Learning, Entrepreneurial Orientation, Entrepreneurship Education.

Introduction

There has been a dramatic change in our conception of learning especially regarding to the role of the lecturers and students in the classroom. Eventually, we have shifted away from behaviourist philosophies of teachers as focal point of knowledge and students as passive receivers.

The first theories of experiential learning arose in the mid-nineteenth century as attempts to move away from traditional formal education which was under attack for being passive and concerned solely with transferring already assimilated knowledge from teacher to student. In experiential education, teachers simply presented students with abstract concepts, and toward an immersive method of instruction. Students would “learn by doing,” applying knowledge to experience in order to develop skills or new ways of thinking (Lewis & Williams, 1994, p. 6).

Experiential Learning Theory (ELT) provides a holistic model of the learning process and a multilinear model of adult development, both of which are consistent with what we know about how people learn, grow, and develop particularly for younger generation. ELT has been used as a framework for innovation in management education, program design and experiential learning in computerized business games (e.g., Boyatzis, Cowen, & Kolb, 1995; Lengnick-Hall & Sanders, 1997).

Role plays, games, case studies, critical incidents, simulations such as “inbox” exercises, socio-drama, and values clarification exercises are some of the many forms of experiential learning techniques currently in use. Experiential learning assignments help students relate theory to practice and analyze real-life situations in light of course material.

Board games have a huge potential as an active learning tool and its can cultivate the experiential learning among the students by allowing them to “learn by playing (doing)”. Research on the use of board games as learning/teaching strategies; have supported the use of play in the classroom. Studies have found that students learn to understand the perspective of other players (DeVries, 2006), develop and use a range of strategies such as planning ahead, predicting the outcome of alternative moves and learning from experience (Selman & Shultz 1990; Kamii & DeVries, 1980) gain a more thorough understanding of academic content (Siegler & Ramani, 2009).

On the whole, the phenomenon of board gaming still survive and is making an exciting comeback with highly innovative and challenging games being introduced, focusing on niche markets and specific fields of learning. There are plenty of new potential board games in the market that can be used as a learning tool in the classroom. Squire (2007) argued that educators (especially curriculum designers) should pay close attention to the recent
board games because they offer uniquely designed experiences in which participants learn through a domain of doing and being. The educators have to move out of their comfort zone to accept the usage of board games in class after realizing their advantages and the result will be very impressive if they integrated the right board games in cultivating the entrepreneurial skills on the students. The use of board games will definitely refresh entrepreneurship education and bring new breed of graduates to the market.

Notwithstanding the fact that the popularity of board games with people of all ages, research is still scarce in the area relating to how board games affect learning (Day 1981).

Research Problem

Business education nowadays is being criticized for being too theoretical driven and lack of critical thinking, creativity and innovation (Behrman & Levin, 1984; Hughes, O’Regan & Wornham, 2008; Synder & Symnder, 2008) especially in entrepreneurship education. The issue of “the perfect learning approach” in entrepreneurship education is still remains debatable. Gibb (1987b) proposed that the learning process in entrepreneurship education is different from the normal classroom teaching. Gibb (2002) further elaborated that entrepreneurship education needs to involve action, encouraging experiential learning, project-based learning, problem solving, creativity and the support of peer-evaluation (Jones & English, 2004).

Currently the focus and process of entrepreneurship education in Malaysia is also too mechanistic and appears to do little to promote entrepreneurial behavior (Ming Yu, Wai Sei and Amir, 2009). Entrepreneurial attitudes are not only required in the course of a classic entrepreneurial career but they are also clearly in high demand independent employment relationships. Entrepreneurship education seeks to propose people especially young people to be responsible as well as enterprising individuals who became entrepreneurs or entrepreneurial thinkers who contribute to economic development and sustainable communities.

The consortium of entrepreneurship education (2008) states that entrepreneurship education is not just about teaching someone to run a business, it is also about encouraging creative thinking and promoting a strong sense of self worth and empowerment.

These limitations of traditional approach in teaching is now being moderated by new approaches such as case studies and games that incorporate real life elements to expose students to actual situations (Adobor & Daneshfar, 2006; Aranda 2007). Mitchell (2004) commented that although case studies provide an avenue to expose students to real life situations but the range of decisional possibilities is still limited due to the static nature of the information given in the case. A substantial body of literature indicates that the use of games, simulations, multimedia instruction and interactive activities are valuable teaching methods. Although playing games in classroom does not solve all the problems with education, it can be a useful tool, one of many different methods and techniques used to involve students with their learning (Nemerow 1996).

The purpose of this study is to examine the following research questions:
1. Does board game perceived as an effective active learning tool in understanding EO?
2. Which learning approaches – lecture or board game is perceived more effective in understanding EO?

Objectives of the Study

The objectives of this study are:
1. To identify the students’ perceived effectiveness of using board game as an active learning tool in understanding EO.
2. To compare the students’ perceived effectiveness of different learning approaches – lecture and board game in understanding EO.

Research Methodology

The research method that was used was questionnaire. The questionnaire consisted of two sections: Section A which was used to collect the participants’ demographics information and Section B provides the five components of EO (Autonomy, Innovativeness, Risk Taking, Proactiveness and Competitive Aggressiveness). The main part of the questionnaire was divided into two research fields which were the assessment of board game lecture in transferring the concept of EO to the learners. The questions in Section B were closed ended and the scale of answers encompassed five levels: strongly agree, agree, unsure, disagree and strongly disagree.
The research was carried out on two groups of students which comprised of 30 participants in each group. These participants were Degree Year 3 students majoring in Internet Technology and they were taking the subject MPU-3232 Entrepreneurship. In Group 1, the students were required to attend a LECTURE on the topic of EO and in Group 2, the students took part in a BOARD GAME to learn about EO.

Every student had an opportunity to express their opinion in the research questionnaire directly after the lecture and at end of the board game activity. Therefore, the answer provided by the respondents encompassed experience gained from the lecture and real participation in the board game.

43 of the respondents were male while 17 were female. The respondents were from three different age groups: 37 participants aged between 21 and 22, 22 participants between 23 and 24 and only 1 participant is more than 24.

Results /Discussions

According to the participants surveyed, below are the hypotheses testing for this study:

**Testing 1: To measure the students’ perceived effectiveness of using board game in understanding EO**

H₀: There is no significant relationship between the students’ perceived effectiveness of using board game as an active learning tool in understanding EO.
H₁: There is a significant relationship between the students’ perceived effectiveness of using board game as an active learning tool in understanding EO.

The significance value of the variable used – Total EO is 0.000. The Wilcoxon Signed Ranks Test’s result is significant (p < 0.01). The null hypothesis is rejected and concluded that there is a significant relationship between the students’ perceived effectiveness of using board game as an active learning tool in understanding EO.

**Testing 2: To compare the different learning approaches used in learning EO**

H₀: There is no significant relationship between lecture and board game in learning EO.
H₁: There is a significant relationship between lecture and board game in learning EO.

The significant value of the variable used – Total EO is 0.008. Mann-Whitney U’s result is significant (p < 0.01). The null hypothesis is rejected and concluded that there is a significant relationship between lecture and board game in understanding entrepreneurial orientation. The means rank for board game and lecture are 36.48 and 24.52 respectively. Since the mean rank of board game is higher than lecture, this suggests that the students perceive by playing board game in understanding EO is more effective if compared to lecture.

The significant values for individual components of EO are Autonomy (0.153), Innovativeness (0.023), Risk Taking (0.007), Proactiveness (0.099) and Competitive Aggressiveness (0.007).

From the obtained result, since Autonomy, Innovativeness and Proactiveness (p ≥ 0.01), it can be concluded that the three components did not significantly contribute to the relationship between board game and lecture in understanding EO individually.

This happened was because the study is only involving one board game which has the restriction in learning all the five main components of EO. This can be compensated with including more different board games with different agenda in the classroom.

**Contributions of the study**

The results of the conducted research had open an option for other researchers to further investigate the potential of using board games as one of the learning approaches and also how to implement the learning activity in the classroom.
Lecturers no longer became the main source of imparting the knowledge to the students. In the classroom setting, lecturers will become a coach which their roles are more to providing guidance and advices. Students will experience, reflect, understand and learn by themselves through participating in the activity. This will fulfilled the objective of student-centred learning as emphasised by most of the educational institutions.

The students can acquire and experience the different soft skills such as decision making, risk taking, creative problem solving, innovativeness and even communication skills while participating in the board games. As commented by the industries that our younger generation graduates were in soft skills which were the major requirements in the industry.

Finally, board games can increase students’ engagement and motivation in learning as younger generations’ had the issue in short attention span of learning. Board games may increase the students’ interest in learning.

Conclusions

To conclude, it was necessary to highlight that the results of the research conducted among the students indicated a high interest in using board game as an active learning tool in understanding the entrepreneurial orientation. It can be assumed that board games were perceived as an effective and desired tool of learning that can be used in later professional practice.

However, according to the results of the conducted research allowed for some suggestions to be made, the purpose of which was to increase an effectiveness usage of the board games in education and also to promote board games as one of the learning approaches.

First, debriefing or discussion of the results at the end of the game was very important. It was more crucial than the activity itself (Garris, Ahlers, & Driskel, 2002; Sallies, 2002) because it allowed the students to reflect upon their gaming experience to develop new skills, new attitudes, or new ways of thinking. The reflection and sharing of the game experience will then turn into successful learning (Crookal 2010, p. 907).

Second, the teachers had to continuously assess and monitored the adequacy of the board games with the relevancy of subject being taught. The teacher should indicate the main purpose of the board game in the beginning to the students so that they were able to see the relationship of using the board games in the learning. A properly designed board game should allow one to generate results that would positively show its participants the increase in the knowledge gained during the game in the normal course rather than just merely for entertainment purpose.

Finally, the obtained research results and suggestions from this paper will contribute to the actions to be taken in the future in promoting and using board games to prepare the students for activity in the field of entrepreneurship.

References


Critical Perspectives on Affect in Mathematics Education and Mathematical Identities

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Abstract

Mathematics education across the world has a long history of disenfranchising learners and leaving them with disabling perspectives of mathematics. This is not an empirical paper, but rather an argument that contends for taking a critical perspective to this pernicious situation and questioning the moral and ethical nature of mathematics teaching practices. Specifically, questioning whether current mathematics teaching practices and educational arrangements are irrational, unsustainable and unjust in developing students’ mathematical identities. While mathematics education is about learning mathematical knowledge and skills, it is also inherently affective, and ignoring this dimension is resulting in broader learning in mathematics that is, in many respects, irrational, unsustainable and unjust.

Keywords: Affect; Critical perspectives; Mathematics education; Mathematical identities; Praxis

Introduction

For many years now the subject of mathematics has be characterised as dull, boring and irrelevant, and many have seen it as inaccessible for all but the brightest minority (Grootenboer & Marshman, 2016). The unpopularity of mathematics and misconceptions about its nature and usefulness have been noted and discussed by researchers in many countries (e.g., Asia: Ng, 2012; USA: Wang, 2013) for many years, and at all levels of education (Zan, Brown, Evans, & Hannula, 2006), and yet little seems to have changed over this time. However, across the globe mathematics is still seen as a very important subject at school, and governments and education systems promote its significance and the critical need for greater participation and achievement. Despite these intentions, the widespread perception that most people cannot do mathematics and that it is to be avoided if possible, tenaciously remains. The strength and long-standing nature of this problem shows that it is well ingrained, and if the situation is to improve, then the beliefs, attitudes and emotions individuals have about mathematics will require sustained attention (Larkin & Jorgensen, 2015).

While this problem is broad, in this paper the focus will be particularly on mathematics education at school. This seems important because the mathematics classroom is the place where one would hope that children would develop an interest and passion for mathematics, and learn about all its beauty and usefulness, and yet it seems that this is the very site where students learn the opposite (Grootenboer & Marshman, 2016). This is incongruous, and highlights a particular dilemma for mathematics educators that is more than just about teaching techniques. Indeed, we posit that mathematics teaching and learning is a moral and ethical practice, and here we want to highlight the moral and ethical imperative to address students’ debilitating affective responses and views of mathematics. This requires a critical perspective on mathematics teaching and learning practices – mathematics teaching as praxis (Grootenboer, 2013).

A critical perspective - considering the moral and ethical nature of mathematics teaching practices, involves questioning whether they are:

- irrational — unreasonable, incomprehensible, incoherent?
- unsustainable — ineffective, unproductive?
- unjust — serving the interests of some at the expense of others, causing suffering? (Kemmis, McTaggart & Nixon, 2014)
In other words, this would mean interrogating whether mathematics education, as experienced by learners, is irrational, unsustainable and unjust, particularly here in terms of their developing beliefs, attitudes and feelings of the subject. Indeed, the wealth of evidence in the literature would indicate that currently mathematics education for many students is irrational, unsustainable and unjust. It is not rational or reasonable for students to finish their schooling viewing mathematics as irrelevant, dull and without purpose. It is not sustainable to have mathematics curricula and pedagogies that result in limited mathematical capacity for individual people and the wider society. Finally, it is not just that students finish their mathematics education at school with mathematical beliefs and attitudes that restrict their capacity to engage in everyday and professional practices that involve numeracy.

Research Problem

The argument presented here addresses the long history of learners’ disabling attitudes and perspectives of mathematics.

Objectives of the Study

The objective of this study is to reconceptualise the perennial issues related to poor affective responses to mathematics by taking a critical praxis-oriented perspective. There is already ample empirical data that shows the pervasive problem of poor and disabling beliefs, attitudes and emotions towards mathematics (e.g., Zan et al., 2006)), and so in response an argument is presented for considering mathematics education as the development of mathematical identities.

Discussion

Mathematical identity is a conceptual tool to think about learning in mathematics more broadly. It is complex and multifaceted, and beyond the scope of this paper to address deeply. Here the focus is on the affective domain, but mathematics education is essentially about learning mathematical knowledge and skills, and beliefs, attitudes and dispositions about mathematics (Grootenboer, 2013). This means that in mathematics classrooms students are simultaneously developing mathematical knowledge, skills, values, attitudes and emotions, and this occurs in an integrated manner. So, by considering mathematics learning as the development of mathematical identities, the outcomes of mathematics education can be considered in a unified way that brings together the interrelated dimensions “including beliefs, values, attitudes, emotions, dispositions, cognition, abilities, skills and life histories” (Grootenboer & Marshman, 2016, p. 28). Indeed, a rational, sustainable and just mathematics education will foster growth in students’ mathematical identities so they are healthy, robust, enabling and positive.

Taking this identity perspective on mathematics education means that it needs to fundamentally be considered as a site-based practice, because the learners’ life histories and contexts will all be integral to the teaching and learning situation. Learners come to any given mathematics classroom with identities (including mathematical identities) that are already formed through their previous experiences, and these will be unique, so this means that there is no best practice formula for how to teach for positive mathematical identities. Thus, mathematics teaching has to be developed that is responsive to the learners and the context of their mathematical learning. That said, there seems to be some broad conditions for mathematics education that in some way prefigure students’ mathematical learning practices and teachers’ mathematical teaching practices, including any centralised curriculum document. If these curricula or syllabuses are overly prescriptive and detailed, then they can constrain the professional opportunities for teachers to engage in mathematical experiences that are responsive and relevant to the particular needs of the site (i.e., the learners and the community). Therefore, a low-definition curriculum that gives more leeway for teachers and students to negotiate aspects of the mathematics program, and will be more amenable to mathematics education that addresses their broader mathematical identities and practices.

While it may seem obvious, by thinking about mathematics education as the development of mathematical identities, deliberate and conscious attention can be directed towards the affective dimension. This has two aspects: the simultaneous and related way beliefs, attitudes and emotions about mathematics develop with mathematical knowledge and skills; and, the role affective qualities have on students’ growth in mathematical knowledge and skills. In the classroom, this would mean taking into consideration students’ emotions as they encounter and engage with mathematical ideas, concepts and skills. For example, if students were coming to a particularly difficult new topic, then the teacher could provide extra emotional support and empathy, and praise
the students for their perseverance. Also, if they approach a subject that may have engendered negative emotions in previous years (e.g., fractions or times-tables) they could prepare the learning environment knowing that the students may well have somewhat bruised mathematical identities around this topic. Furthermore, educators would be cognisant of the potential beliefs and attitudes student might develop towards mathematics as they prepare their lessons and units. To illustrate, in an algebra lesson overt attention could be given to the practical and relevant contexts where algebra is used, so students do not develop a belief that mathematics is useless and of no practical value.

Relatedly, teaching practice is enabled and constrained by local conditions and arrangements, and so as well as paying attention to teaching practices, attention also needs to be given to the conditions that hold it in place (Kemmis, Wilkinson, Edwards-Groves, Hardy, Grootenboer & Bristol, 2014). As was outlined briefly above, obvious broad conditions like the mandated curriculum enable certain topics to be taught, and restricts others. However, the curriculum prefigures, but does not necessarily predetermine, the forms of pedagogy that a teacher or school may undertake in any given site, and so in this space there is scope for responsiveness to local needs and circumstances. It is well known that many students see mathematics as irrelevant and of no practical value, so if students are to appreciate the usefulness of mathematics and its applicability to their lives, then they need to experience meaningful applications of mathematics. In particular, they need to see and use mathematics in contexts, examples and problems that are relevant to them (Grootenboer & Sullivan, 2013), and conversely, if their mathematical experiences are completely divorced from their identities and contexts, then they will learn that mathematics is indeed useless and irrelevant. For example, students in remote Australian Aboriginal schools often have sharply honed skills and knowledge related to spatial reasoning and directions, but these same students consistently do poorly on items related to these topics on externally set numeracy tests (i.e., NAPLAN). However, their poor results are not representative of their advanced knowledge and skills related to moving in physical space and directions, but the abstract and unfamiliar context of the assessment makes it almost impossible for these students to display their mathematical ability (Grootenboer & Sullivan, 2013). Clearly this educational situation is irrational, unsustainable and most pertinently, unjust. Mathematics education practices need to be developed within the constraints of the prevailing conditions and arrangements, but also in ways that take into account the mathematical identities that students enter the classroom with, and with a clear eye as to the sorts of mathematical identities that they will develop.

Finally, it is important that mathematics teachers themselves have a positive mathematical identity, including a sense of joy and fulfilment about mathematical participation. They must see mathematics as something that has helped define their sense of self and vocation, and more than just an inert body of information and skills that they deliver to students. Palmer (1993) suggested that effective teachers have and display a friendship-type relationship between themselves and their subject, and through this, “students are affirmed by the fact that this teacher wants them to know and be known by this valued friend” (p. 104). He went on to suggest that effective teachers are able to bond with student and subject, and so facilitate the students’ relationships with the subject – their mathematical identity.

**Contributions of the study**

To take a critical perspective to mathematics teaching is to consider and develop it as a site-based practice. In essence, this is thinking about mathematics education from the ‘classroom out’ - starting from the learners. Grootenboer and Marshman (2016) commented:

> In the end mathematics education occurs when real students meet real teachers in real classrooms around the wondrous and fascinating practices of mathematics. If we lose sight of the critical nature of the site, with all its idiosyncrasies, then mathematics education will be irrational, unsustainable and unjust, because it will not serve the needs of the very students it is supposed to equip and inspire - the particular and unique learners in each classroom site. Of course, this is an ever present and worrying concern as in many places curricula become increasingly externally prescribed and teachers’ practice becomes overly constrained by assessment regimes and measures of performative. Furthermore, if mathematics is presented as a context-free, ahistorical discipline, then many years of research and common perception tell us that mathematics will be viewed as a ‘dry-bones’ subject with little value or connection to learners’ real lives, and these beliefs will underpin their mathematical identities and restrict future mathematical engagement and participation. (p. 126)

This is not rational, or sustainable, or just.
Conclusions

In reviewing an extended and persistent history of unhealthy and debilitating affective responses to mathematics there is frustration and dissatisfaction that, by and large, little has changed. Despite some localised studies that have reported some positive results in this area, there is an undeniable and pressing challenge, because the current situation is irrational, unsustainable, and unjust. But what should be very clear is that mathematical affect is not somehow distinct and separable from mathematical knowledge and skill. This is why the emphasis has been on the concept of mathematical identity.

For mathematics education to foster the development of healthy and robust mathematical identities, then more conscious and deliberate attention needs to be given to the affective aspect of learning mathematics. However, education is essentially site-based and so notions of best practices are not entertained, but there are some broad tenets that could be useful in developing site-based mathematics teaching practices, including:

- overtly attending to the classroom climate and interactions (Hackenberg, 2010);
- mathematics teachers continuing to engage in mathematical practices and developing their own mathematical identities;
- paying particular attention to the conditions that enable and constrain mathematics education in the school site;
- explicitly paying attention to students’ feelings and attitudes as they go about learning mathematics; and,
- deliberating on the beliefs about mathematics and themselves as mathematical learners, that learners might develop through the planned classroom experiences. (Grootenboer & Marshman, 2016)

A praxis approach where conscious attention is given to developing students’ mathematical identities will lead to mathematics education that is more rational, more sustainable, and more just, not just for the learners, but for the broader society as well.

References

Student Perceptions of Learning Probability and Statistics Using Computer-assisted Concept Mapping Strategy

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Abstract

Probability and statistics is an important part of the mathematics curriculum. The learning of probability and statistics allows students a better appreciation of the applicability of mathematics (Garfield and Ahlgren, 1988; Shao, 2015). The objective of this study is to examine students’ perception of using a computer-assisted concept mapping strategy in learning probability and statistics. This study employed a quantitative approach to gather students’ perception through a questionnaire. The participants were 33 students of Monash Foundation Year Programme who took a probability and statistics course at Sunway College Johor Bahru. The results showed the students’ positive perception of using the computer-assisted concept mapping strategy: it was a helpful, new and interesting way of learning probability and statistics.

Keywords: Perception, Computer-assisted Concept Mapping Strategy, Probability and Statistics.

Introduction

Probability and Statistics is an important part of the Malaysian mathematics curriculum at the secondary level. Probability is a study that measures the likelihood of a random phenomenon while statistics is an investigation process that involves the study of data collection, presentation, analysis and interpretation.

Basically, there are three areas being taught in the course comprising descriptive statistics, basic probability and inferential statistics (Curriculum development centre, 2006). However, research claimed that most of the students do not grasp the concepts they learned in the introductory statistics course (Garfield & Ahlgren, 1988; Liu, 2010; Ismail & Chan, 2015). Shao (2015) also mentioned in her study that students have difficulty in learning probability mainly because they face problems in understanding abstracts or directly observe the stability of the probability. According to the Principles and Standards for Schools Mathematics for grade 9 – 12 (National Council of Teachers of Mathematics (NCTM), 2000), the mathematics curriculum should be deliberately structured to include the experiences and development of mathematical 1) problem solving 2) communication 3) reasoning and 4) connections. However, some mathematics teachers do not possess sufficient knowledge of the subject matter and in the pedagogical approach to create a meaningful learning experience. These have become the underlying reason why students have encountered difficulties in the learning of Probability and Statistics at the college level.

According to Ausubel’s learning psychology, meaningful learning occurs when the learner assimilates the new knowledge to the existing cognitive structure that is held by the learner (Ausubel, 1963; Ausubel et al., 1978). Novak (2002) noted that concept mapping can be an effective way to facilitate meaningful learning in two conditions: 1) the concept map serves as a learning tool to help learner clearly connect concepts to their prior knowledge, and progressively spectacles more explicit knowledge hierarchically to develop conceptual frameworks; and 2) the concept map also serves as an evaluation tool that is, to facilitate a teacher’s evaluation of the students’ meaningful learning by identifying both valid and invalid ideas held by the students. In return, the teacher’s evaluation will indirectly control the motivation of students’ choice to learn meaningfully.

With advanced technology, students can design a concept map by using a computer software. A computer-assisted concept mapping strategy (CCMS) is to create a concept map (CM) by using computer softwares, one of which is the Microsoft OneNote. One of the benefits of using CCMS is it provides a more flexible space where students have no problem to extend the branches of the CM whenever necessary. Students can produce a one-page CM regardless of the extensiveness of branching. Besides, CCMS allows students to collaborate by sharing their knowledge in creating CM. The computer-assisted concept map (CCM) is portable: students can...
create, modify or read it from the smart devices either online or offline. Students can also print the CCM for the use of a group of people (Mahsa, 2013). Furthermore, they can allow the online sharing of CCM with their teacher to allow immediate evaluation and feedback. Generally, CCMS provides a faster and more effective way of teaching and learning (Tseng, et al., 2012; Mahsa, 2013; Trehan, 2015).

Research Problem

Research studies remark the significant benefits of using the concept mapping strategy in various contexts of teaching and learning. Indeed, the idea of integrating technology in classroom is welcomed by the mathematics teachers. However, CCMS is rarely applied in the majority of Malaysia mathematics classrooms, especially in the higher education setting. In view of the above, this study aimed to understand the students’ perception of using CCMS in the learning of probability and statistics. This study sought to find answers to the following research question:

1. How do the students perceive the use of CCMS in learning Probability and Statistics?

Objectives of the Study

The study aimed to fill the gap of understanding the students’ perception of using CCM in learning probability and statistics. The research objectives are to:

1. understand the students’ perception of using CCMS in learning probability and statistics; and
2. employ CCMS as a learning tool to assist students’ learning of probability and statistics.

Research Methodology

This study employed a quantitative research approach to investigate the students’ perception of using CCMS in learning probability and statistics. The quantitative data was collected through a questionnaire completed by the participants.

Participants

The participants comprised 33 students (15 males and 18 females) of the Monash Foundation Year Programme who were taking a probability and statistics course as a compulsory course at Sunway College Johor Bahru. These students represented a broad spectrum of cultural and socioeconomic backgrounds. The students attended the course in the natural classroom environment. They have some introductory knowledge of probability and statistics in their secondary school studies. All of these students have also achieved at least a credit in mathematics in the Malaysian Certificate of Education (SPM) results. They have no experience in using CCMS in their prior mathematics studies. Their ages ranged from 19 to 27. 33 students were selected as the participants in this study because there were limitations in the number of students in this course.

Instruments

The quantitative data of this study was collected by using a questionnaire. The questionnaire was adapted from Mahsa’s (2013) study. The questionnaire consisted of 18 items in relation to the use of CCMS in learning probability and statistics. The questions are close-ended and the responses are based on the 4-point Likert scale: 1 stands for “strongly disagree”, 2 for “disagree”, 3 for “agree”, and 4 for “strongly agree”. These items were divided into two main categories: 1) the perception of CCMS in general, and 2) the perception of learning. The first category was separated into two subgroups, i.e. the perception of CCM versus the handmade CM and the perception of the ability of creating CCM. To manually prepare the CM, the participants were asked to draw a CM on a piece of paper. The first subgroup had five items while the second subgroup had six items, both consisted of eleven items in total. The second category had seven items that deal with the students’ perception of learning probability and statistics using CCMS.

Procedure

This study was conducted over a duration of 18 weeks. In the first week of the semester, the researcher, who is the lecturer of this course, introduced the objective of the project which is using CCMS in the learning of probability and statistics. In the following weeks, the researcher employed both the traditional and handmade
concept mapping strategy in teaching. The participants were trained on some basic principles of creating a CM following the instruction from Novak and Cañas (2008). The researcher used the handmade CMs to provide introduction of each study area of the course by explaining the relationship among the mathematical concepts. The participants experienced the handmade CMs while the researcher was lecturing in the class. At the end of each study area, the participants were grouped and prompted with some brainstorming questions in order to create a CCM. Based on the CCM, the researcher gave feedback and corrected some of the participants’ misconceptions. At the end of the semester, the participants were required to fill out a questionnaire to indicate their perception of using CCMS in learning probability and statistics.

Data Analysis

The questionnaires were gathered. The researcher analysed the data by counting the frequency and percentage of each of the questions in the questionnaire. Descriptive statistics were calculated for the two categories. The results were displayed in a table.

Results /Discussions

The results of the study are shown in Table 1. A total of 29 questionnaires were collected from the participants as 4 students were absent on the day when the survey was conducted.

Despite this study having a small sample size, the results obtained showed a significant pattern of students’ perception of learning probability and statistics in relation to the use of CCMS. The Cronbach’s alpha value for each dimensions were 0.88, 0.73 and 0.83 respectively (see Table 1), indicating the results has high reliability. Since a 4-point Likert scale was used, 2.5 was the midpoint. The survey responses with a mean of 2.5 or greater are referred to as supportive; and the responses with means less than 2.5 are referred to as less supportive.

The participants showed positive responses (mean 2.74, SD 0.8) towards the CCM when compared to the handmade ones. Most of the participants felt that CCMS is more interesting (item 1), and provides more advantages compared to the handmade ones (item 12), that is easier to communicate with other students (item 13) and is easier to be constructed (item 16). They wish to be able to use the CCMS at home (item 15).

The mean of the ability of creating CCM was 2.20 (SD 0.86). Generally, the participant disagreed that they are not the type to do well with computer softwares but the majority of them felt that the CCM softwares were challenging. Therefore, they needed more training to familiarize themselves with the skills of using the CCM softwares. More importantly, the participants would like to use CCMS in future as they (86%) disagreed that using CCMS was a waste of time.

THE students’ perception of learning probability and statistics using CCMS was relatively more positive with the mean 3.20 and SD 0.60. Most of the participants agreed that they enjoyed sharing their knowledge with their classmates via the CCM. All the participants (52% agree, 48% strongly agree) agreed that using CM (either handmade ones or computer ones) have helped them to develop a better conceptual understanding. They found it is easier to visualize the contents of the whole study area through CCMS. In fact, the majority of the participants perceived that the CCMS has provided them with the learning opportunities that they have never tried before in the regular mathematics classes. They also found that this strategy is helpful as a new way of revision. They (69%) are able to solve post-revision activities and they have improved in their topic test results when they used this strategy for revision (79%).

The findings of this research has answered the research question and is consistent with the results of several studies mentioned in the literature review (Tseng, et al., 2012; Mahsa, 2013; Trehan, 2015). Mahsa (2013) agreed that students have a positive attitude towards using the softwares to design a CM. Tseng et al. (2012) claimed that positive concept mapping perception can facilitate students’ learning process. Students perceived that their ability to integrate statistical concepts has improved through the use of CM (Trehan, 2015). This study showed that most of the participants welcomed the implementation of CCMS a mathematics class. Therefore, this research study provides ideas for future study of the relationship of CCMS with the student achievement of learning. They felt their ability to integrate statistical concepts was enhanced through the use of CM.

Contributions of the study
The CCMS provides mathematics teachers with a new approach on how to engage more students in learning mathematics. The results show a positive indication of students’ attitude towards the use of CCMS as a useful method of revision that will enhance their conceptual understanding.

**Conclusions**

This study examined the perception of 29 pre-university students who studied a probability and statistics course in the Monash University Foundation Year Programme. The result shows a positive attitude among the students towards the use of CCMS in learning probability and statistics. Most of them preferred to create CM using the computer software as the technology allows the students to create and share the CMs more easily and conveniently. The students felt that they could improve their conceptual understanding and test performance after using the CCMS. Since this research is at the very beginning stage, future research is recommended with a bigger sample size to further enhance the value of current research.

**Figures/Display Elements**

### Table 1. Analysis of students’ perception.

<table>
<thead>
<tr>
<th>No</th>
<th>Items</th>
<th>Students’ response</th>
<th>1 - Strongly Disagree</th>
<th>2 - Disagree</th>
<th>3 - Agree</th>
<th>4 - Strongly agree</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The concept map software is more interesting than the handmade ones.</td>
<td></td>
<td>6</td>
<td>16</td>
<td>55%</td>
<td>6</td>
<td>21%</td>
<td>0.74</td>
</tr>
<tr>
<td>12</td>
<td>There are lots of advantages in designing a concept map by software than handmade.</td>
<td></td>
<td>1</td>
<td>11</td>
<td>30%</td>
<td>14</td>
<td>40%</td>
<td>0.71</td>
</tr>
<tr>
<td>13</td>
<td>Software concept maps are more suitable to communicate more with other students than the handmade ones.</td>
<td></td>
<td>1</td>
<td>3</td>
<td>54%</td>
<td>13</td>
<td>45%</td>
<td>0.77</td>
</tr>
<tr>
<td>15</td>
<td>I would like to be able to use concept map softwares at home.</td>
<td></td>
<td>2</td>
<td>7%</td>
<td>10</td>
<td>34%</td>
<td>11%</td>
<td>0.87</td>
</tr>
<tr>
<td>16</td>
<td>Designing a software concept map is easier than its handmade one.</td>
<td></td>
<td>3</td>
<td>10%</td>
<td>9%</td>
<td>31%</td>
<td>13%</td>
<td>0.85</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Items</th>
<th>Students’ response</th>
<th>1 - Strongly Disagree</th>
<th>2 - Disagree</th>
<th>3 - Agree</th>
<th>4 - Strongly agree</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>I need do a lot of ruminating in a course which uses concept mapping software to understand how to use them.</td>
<td></td>
<td>0</td>
<td>10</td>
<td>30%</td>
<td>14</td>
<td>50%</td>
</tr>
<tr>
<td>6</td>
<td>Using concept map software in a summarizing a study area in Mathematics Unit 2 is a waste of time.</td>
<td></td>
<td>9</td>
<td>13%</td>
<td>16%</td>
<td>55%</td>
<td>3%</td>
</tr>
<tr>
<td>8</td>
<td>I felt isolated when I participated in a course using concept map softwares.</td>
<td></td>
<td>10</td>
<td>34%</td>
<td>16%</td>
<td>55%</td>
<td>3%</td>
</tr>
<tr>
<td>10</td>
<td>The concept map softwares are complicated to use.</td>
<td></td>
<td>5</td>
<td>18%</td>
<td>8%</td>
<td>29%</td>
<td>12%</td>
</tr>
<tr>
<td>11</td>
<td>I am not the type to do well with softwares.</td>
<td></td>
<td>6</td>
<td>21%</td>
<td>10%</td>
<td>34%</td>
<td>10%</td>
</tr>
<tr>
<td>14</td>
<td>In the future, do not want to use concept map softwares.</td>
<td></td>
<td>4</td>
<td>14%</td>
<td>17%</td>
<td>59%</td>
<td>8%</td>
</tr>
</tbody>
</table>

**Learning using CCMS (crambch’s alpha = 0.83)**

<table>
<thead>
<tr>
<th>No</th>
<th>Items</th>
<th>Students’ response</th>
<th>1 - Strongly Disagree</th>
<th>2 - Disagree</th>
<th>3 - Agree</th>
<th>4 - Strongly agree</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Concept maps (whether softwares or handwritten) help me to have better conceptual understanding.</td>
<td></td>
<td>0</td>
<td>0%</td>
<td>0%</td>
<td>12</td>
<td>52%</td>
<td>0.50</td>
</tr>
<tr>
<td>4</td>
<td>I enjoy sharing my knowledge of a study area in Mathematics Unit 2 with my classmates via concept maps softwares.</td>
<td></td>
<td>0</td>
<td>0%</td>
<td>2%</td>
<td>7%</td>
<td>63%</td>
<td>0.57</td>
</tr>
<tr>
<td>5</td>
<td>As a new way of revision, I think concept mapping softwares are interesting.</td>
<td></td>
<td>0</td>
<td>0%</td>
<td>3%</td>
<td>10%</td>
<td>21%</td>
<td>0.57</td>
</tr>
<tr>
<td>7</td>
<td>Concept map softwares provide me with learning opportunities that I have never tried before in usual mathematics classes.</td>
<td></td>
<td>0</td>
<td>0%</td>
<td>1%</td>
<td>3%</td>
<td>20%</td>
<td>0.50</td>
</tr>
<tr>
<td>9</td>
<td>It is easier for me to visualize the contents of the whole study areas through concept map softwares than without them.</td>
<td></td>
<td>0</td>
<td>0%</td>
<td>2%</td>
<td>7%</td>
<td>63%</td>
<td>0.57</td>
</tr>
<tr>
<td>17</td>
<td>When I use concept map softwares for revision, I’m more able to solve post-revision activities.</td>
<td></td>
<td>0</td>
<td>0%</td>
<td>9%</td>
<td>31%</td>
<td>13%</td>
<td>0.57</td>
</tr>
<tr>
<td>18</td>
<td>When I use concept map softwares for revision, I improve my topic test results.</td>
<td></td>
<td>0</td>
<td>0%</td>
<td>6%</td>
<td>21%</td>
<td>14%</td>
<td>0.57</td>
</tr>
</tbody>
</table>
References


Students’ Perceptions of the Event Management Programme in a Malaysian University

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Abstract

This paper explores students’ perceptions on course structure and the delivery of lessons by lecturers in a Malaysian university. In this research, a total of 16 students were selected from the Diploma level of Event Management programmes. They were interviewed using semi-structured questions. The results were then analysed using the interpretive approach which yielded five themes for perceptions on course structure and six themes for perceptions on lecturers’ delivery of their lessons. The findings also indicated that practical element should be adopted in designing event management curriculum.

Keywords: Course structure, education, event management, delivery of lessons, students’ perceptions.

Introduction

Since the establishment of Malaysia Convention and Exhibition Bureau (MyCEB) in 2009, it has strengthen the business position of international meeting, incentives, conventions and exhibitions (MICE) market (Sharif, 2013). This industry has generated millions of ringgits in terms of revenue in Malaysia. The MICE industry has created a need for qualified manpower to meet the demands of event management organisations in Malaysia (Bouchon, Hussain & Konar, 2015).

As a result, Malaysian Universities and Colleges are taking this opportunity to design and develop event management programmes to educate and train students to meet the labour demand for the industry (Bouchon et. al., 2015). For this purpose, event management programme in a university is designed to be both theoretical as well as skill based (Bouchon et. al., 2015; Lee, Lee & Kim, 2009). It is aimed at equipping students to fulfil the needs of the industry. The curricula of Event Management education is still evolving (Bouchon et. al., 2015) and there is a dearth of research on students’ perceptions of such programmes and how their learning experiences in the programme can be enhanced.

The Diploma in Event Management programme in a university consists of 6 semesters that stretch to 2 years of duration. This programme consists of 70% of event management courses and 30% of compulsory courses (general study courses). At the final semester, students will have their internship with event management organisations. The delivery methods used in conducting event management courses include lectures, tutorials, and practical classes (e.g. case studies, student led discussions, demonstrations, and video presentations).

Students’ Perception

According to Neal (2009), students’ perceptions of their programme of study will determine their attrition rate. This is because, it will create an impact in their learning experience. Neal (2009) reveals that students who are actively involved in their learning are more likely to graduate. This includes participative learning in the classroom that frequently engaged in campus life as a whole. Hence, the student’s perceptions towards the programme play an important role in enhancing the programme concerned . In addition, students will learn better by adopting experiential learning because this method can bridge the learning theory gap with event management courses. (Lamb, 2015)

The perceptions of students about what they do and their success in carrying out the task will determine their success (Sedhu, Choy & Lee, 2015). Therefore, individuals involved in a learning situation will bring with them
a set of values, perceptions and attitudes that will influence the way they make sense of their environment. These perceptions are often conveyed in the form of implicit or explicit messages to those who interact with them. According to Ajzen (1988), perceptions form attitudes which cannot be directly assessed but can be inferred from observation and responses to questions.

As one of the main stakeholders in tertiary education, students’ perceptions are imperative for the development of curriculum (Lee et al., 2009). Their perceptions of the course will be able to assist in assessing courses offered and designing curricula. These perceptions will in turn be useful for lecturers as they plan their teaching and learning activities for the enhancement of students’ learning. Student perceptions are also useful for lecturers to select the appropriate teaching techniques that match students’ level of understanding for the retention of information and for students’ assessment (Hsu, 2013).

Research Problem

This study attempts to examine the students’ perceptions of the structure of the Event Management programme as well as the approaches used to teach them. This will give an indication of the effectiveness of the approaches used to teach the courses in the programme. In this case, they will possess all the relevant skills necessary to enable to work without need for further training. An effective way of determining if a programme is successful in equipping them with such skills is through their perceptions of the programme (Malenee & Choy, 2015).

Objectives of the Study

To determine students’ perceptions of the event management programme, two research questions (RQs) underpin this study.

1. What are the perceptions of the students towards the Event Management course structure?
2. What are the perceptions of the students towards the lesson delivery of lecturer?

Research Methodology

Students’ perceptions were determined through a series of questions designed specifically to assess their perceptions in the event management programme in which they were enrolled in. An interpretive approach is adopted in this qualitative research method (Creswell 2013). This approach seeks to make meaning of individual experiences in order to develop a pattern. Through this research, students were interviewed with a mixture of semi-structured and open ended questions. There are a total of 10 questions each for course structure and lesson delivery based on literature review (e.g. Hsu, 2013; Lamb, 2015; Lee et al., 2009; Neal, 2009). This allowed students to voice their perceptions on the course structure and the delivery of the programme. The interview focused on attempting to assess students’ perceptions towards the course structure and the delivery of the lessons and how they can enhance students’ learning process (Creswell 2013; Veal, 2011). The sample consists of 80% of volunteered students which is equivalent to a total of 16 students enrolled in Diploma level of Event Management programme were interviewed (12 females and 4 males) and the age range from 18 to 21 years old. These students were from Year 2 Semester 1 and they were interviewed individually for 30 minutes per student in a consultation room. They were informed that they could withdraw from the research at anytime of the study. The students were also informed that all data obtained would be kept confidential and would only be viewed by the researchers.

Results /Discussions

The perceptions of the students towards Event Management in terms of the course structure.

The transcript of the interviews were analysed and the following themes emerged from the data. In an attempt to make the quotes from students more understandable, the language used was corrected.

In respect to course structure, students are positive with the courses offered. The term ‘positive’ refers to respondents’ satisfaction with the course structure and vice versa. Table 5.1 shows the themes with the percentage of frequency.
Table 5.1 Students' perceptions of course structure

<table>
<thead>
<tr>
<th>Themes</th>
<th>Definitions</th>
<th>Frequency Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Students’ understanding of event knowledge</td>
<td>75</td>
</tr>
<tr>
<td>Relevance</td>
<td>Courses offered are relevant to event management</td>
<td>75</td>
</tr>
<tr>
<td>Difficulty</td>
<td>Level of difficulty of the courses</td>
<td>100</td>
</tr>
<tr>
<td>Practical</td>
<td>Availability of practical experience for students</td>
<td>37.5</td>
</tr>
<tr>
<td>Workload</td>
<td>Students ability to cope with the workload</td>
<td>62.5</td>
</tr>
</tbody>
</table>

Except for availability of practical experience for students, students were more positive towards course structure.

Students complimented the sequence of courses offered in the programme because the structure was designed according to the sequence of difficulty."

Student 1 commented: "Yes, courses such as Event Catering, Event Tourism and other event courses are well structured. And the courses are well arranged in accordance to the difficulty level."

In developing curriculum, students’ perception had been the major consideration to ensure the difficulty level of each course. Similarly, the study done by Lee, Lee & Kim, (2009) had also revealed the same result.

In addition, this study found that students prefer core courses than other courses.

Student 7 commented: "The courses such as Introduction to Hospitality Industry and Food and Beverage for Event Management are related to our programme."

Student 5 commented: "The courses provided in event management programme are relevant in the industry."

In contrast, event-related courses were interesting but not for IT (Information Technology) and General Study courses.

Student 9, 10 and 11 commented that General Study and IT were not related to the Event Management.

Even though the study done by Hsu (2013) acknowledge that students' perception of the course would be able to assist in assessing the courses offered, IT and MPU were compulsory courses for students in the faculty. Please add the statement after that with "In this case, students' assessment of the compulsory course may not influence the decision to offer these courses to students.

On the other hand, the study done by Hsu (2013) could be extended on the constructive comments from the students. Students recommended that more practical classes to be made available for this programme.

Student 1 commented: "Throughout the courses, the aims and objectives are not what I have expected. As we learn event through the notes but lack of practical experiences. There is still a room for improvement...

He also commented:
"I expect the course to be more hands-on experience on the event. You have to look into the whole concept in order to feel the event experiences."

Student 7, 8, 9, 10 and 11 also commented that they were willing to accept the challenges of organising events. This is because it will enhance their comprehensive level in event management courses as noted by Lamb (2015).

For Event Management programme, year one students would have to learn the theory of event before they could proceed to do practical in year two.
On one hand, students preferred to have more practical classes. On the other hand, they claimed that the programme came with many courses.

Student 7, 10 and 11 commented that they had too many subjects to focus on.

Student 8 commented: "... have too many courses to study. ...have to reduce some courses that not related to Event Management."

In this case, students were required to enroll between six to seven courses in a long semester while three courses in a short semester. In spite of that, students did not care much on the difficulties in the course structure. Many students admitted that passing examination was more important in studying this programme.

**The perception of the students towards Event Management in terms of the delivery of lecturers’ lessons.**

In terms of delivery of lessons, students were more positive. Table 5.2 shows the themes with the percentage of frequency.

<table>
<thead>
<tr>
<th>Themes</th>
<th>Definitions</th>
<th>Frequency Percentage (%) (N=16)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td>Visual aids</td>
<td>The usage of visual aids in teaching.</td>
<td>50</td>
</tr>
<tr>
<td>Affectiveness</td>
<td>How effective is the teaching skills of the lecturer.</td>
<td>75</td>
</tr>
<tr>
<td>Motivation</td>
<td>Lecturer motivates students to understand the whole course.</td>
<td>87.5</td>
</tr>
<tr>
<td>Encouragement</td>
<td>Lecturer encourages students' participate in the class.</td>
<td>100</td>
</tr>
<tr>
<td>Interest Stimulation</td>
<td>Lecturer stimulates interest in the topics taught.</td>
<td>100</td>
</tr>
<tr>
<td>Teaching materials</td>
<td>The materials and resources given during class.</td>
<td>100</td>
</tr>
</tbody>
</table>

**Table 5.2 Students’ perceptions of lectures’ lesson delivery**

It was found that lecturers shared their experience, showing event photos and video, and giving more examples while teaching. Some students gained the knowledge on event management through materials used by lecturers. Notes, tutorials and audio visual aids had improved the event understanding.

Students 2 and 3 commented that lecturers would explain further when they were in doubt. They used examples and pictures to enhance learning.

Student 6, 9 and 10 commented that lecturer gave them some examples while explaining.

Student 8 commented: "Yes, animation and video."

This was consistent with the study on lecturers who had to prepare their teaching and learning activities before class Hsu (2013).

On top of that, students were satisfied with lecturers' attitude. Lecturers were patient in teaching.

Student 12 commented: "Well explain and very patient."

Student 1 commented: "When we have problem in study, our lecturers will explain at our level of understanding. All our lecturers are patient in their teaching”

This participative and collaborative learning would ensure the graduation of students as supported by Neal's (2009) study. Hence the perceptions of students toward the programmes they were enrolled in played an important role.
Contributions of the study

This study contributes to the knowledge of students’ perceptions especially on course structure and delivery of the lessons. It is also applicable to education institution in developing Event Management programme.

Conclusions

The findings have answered the research questions on course structure and delivery of lessons. The result of this study provides opportunity for the research of event management students perceptions in the future. This research has indicated that practical elements to be included in course structure as to enhance their learning level. As noted by Lamb (2015) that hands-on experience in organising events would help to bridge the gap of theory and event management courses. The methods of delivering the lesson by the lecturers should match the learning level of the students (Hsu, 2013).

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C20

Developing Digital Pedagogy: The Impact of National Strategy and Enhancement Themes in the Athlone Institute of Technology (AIT)

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Abstract

The Irish higher education sector has experienced a variety of key policy developments in the recent past. The publication of a ‘National Strategy for Higher Education to 2030’ was followed by the establishment of the National Forum for the Enhancement of Teaching and Learning (NFETL) and the subsequent publication of ‘A Roadmap for Enhancement in a Digital World’ 2015-2017. In tandem, the National Forum devised the first national enhancement theme ‘Teaching for Transition’ and more recently ‘Assessment for, as and of Learning’ with research funding allocated.

This paper will discuss two current national educational research projects that focus on the development of digital pedagogy, in which AIT is a collaborative partner. The first focuses on supporting transition through enhancing feedback in first-year using digital technologies. Y1Feedback is a two-year (2015-2017) multi-institutional change project involving two universities and two institutes of technology (IoTs). Informed by both an analysis of current assessment and feedback practices across the four partner institutions, in addition to a review of the literature, a number of themes for action emerged, including: embedding assessment and feedback literacies; provide opportunities for dialogic feedback; and fostering sustainable feedback practices that encourage self-regulated learning. These informed the development of a range of approaches to implementing technology-supported feedback.

A complimentary project, the Technology Enhanced Assessment Methods (TEAM) for Science and Health project also funded by NFETL involving four IoTs, including AIT. The development of both technical and soft skills is essential in terms of both student learning and employability, in Science and Health practical setting. The IoT sector in particular places a major value on producing graduates who are ‘workplace ready’ with an emphasis on developing practical skills, with assessment influencing student learning, effort and engagement. The TEAM project (2016-2018) is exploring the potential offered by digital technologies to address concerns such as over-assessment, authenticity and graduate skill development, particularly as there is considerable scope for improvement in practical assessment practices at undergraduate level.

This paper will outline the activities in the project phases for each project. In keeping with the timing of the projects findings will be presented. The paper will explore how these projects are both supporting national strategic objectives and are used to leverage curriculum enhancement within an institute of higher education including the engagement of students as partners and the development of digital and assessment literacies amongst staff and students.

Keywords: Curriculum enhancement, digital and assessment literacies, digital pedagogy.

Introduction

Recent European and national policy, and strategic developments have provided the opportunity to Irish institutes for higher education to work collaboratively in educational research projects (DES, 2011; (European Commission, 2013; NFETL, 2015). Enhancement funding is provided by the NFETL through a competitive bidding process, supported by the Irish Higher Education Authority. This seeks to address key recommendations articulated in the recent publication ‘A roadmap for enhancement in a digital world’ 2015-2017 (NFETL, 2015).
The Athlone Institute of Technology, in collaboration with partner institutes was awarded funding for two, national multi-institute projects which are the focus of this paper. Both projects seek to assist in achieving specific recommendations of the digital roadmap. This will be accomplished by ‘strengthening collaboration within and between institutions, and with different parts of the higher education sector’ and ‘developing shared policies and infrastructure that reflect the complexity of an increasingly digital world’, in addition, the projects will assist in developing ‘a consistent, seamless and coherent digital experience for students in Irish higher education’ while actively engaging ‘with students and teachers to develop their digital skills and knowledge’, finally the projects seek to ‘develop a strong evidence base for enhanced pedagogy’ (NFETL, 2015). In so doing, both projects have the potential to make key contributions in enhancing curriculum design and informing the development of pedagogical, digital and assessment practices.

The Supporting Transition: Enhancing Feedback in First Year Using Digital Technologies - Y1Feedback Project is a two-year multi-institutional change project which commenced in 2015. Designed to support first year students in their transition to higher education through enhancing feedback using digital technologies. The Technology Enhanced Assessment Methods (TEAM) for Science and Health Project was designed to explore the potential offered by digital technologies to address concerns such as over-assessment, authenticity and graduate skill development. This project commenced in 2016.

As similar approaches were adopted in each project this paper will initially provide an overview of the Y1Feedback Project, by outlining the research questions identified, the aim of the study, the research methodologies adopted and a brief presentation and discussion of key findings to date. The overview of the TEAM Project, which commenced more recently, will outline the research questions and the aim of the study and present the model emerging for enhancing curriculum change, based on a synthesis of the literature. The contribution or impact of both projects will be discussed.

The Y1 Feedback Project - research problem

Studies have suggested that ‘feedback is one of the most powerful influences in learning and achievement (Hattie & Timperley, 2007, p. 81). Indeed it is further suggested that feedback has significant potential in supporting and enhancing student learning (Carless, Salter, Yang, & Lam, 2011). In particular, feedback is deemed to be a fundamental way to facilitate students’ development as independent learners who are able to monitor, evaluate, and regulate their own learning (Ferguson, 2011). This applies particularly to first year when supporting students to make a successful transition (Tinto, 2005). It is also suggested that focusing on transition pedagogy can enhance the development of key digital and assessment literacies (Kift, 2015). The Y1 Feedback Project was also designed, in response to documented evidence from the Irish Student Survey on Engagement (2014). The report indicated first year students’ dissatisfaction with feedback on academic performance. First year undergraduates (67.4%), when asked how often they received timely written or oral feedback on academic performance responded never (45.1%) or sometimes (22.3%) (ISSE, 2014). The ISSE is modeled on national studies in Australia (AUSSE) and the US and Canada (NSSE), which reported similar findings.

Aim

The overall aim for this project is to enhance feedback practice in first year undergraduate programmes by identifying and developing case studies of technology–enabled feedback approaches in first year to support transition.

Research Methodology

This research project is underpinned by design based research, a contemporary approach receiving attention from researchers in education as an emerging framework that can guide the development of enhanced educational outcomes (Hetherington & Reeves, 2011). Phase one of the project involved conducting a current practice review across the four participating HEIs with the aim of providing a snapshot of current feedback practices in first year. Utilizing a mixed-methods approach the review was conducted between April and June 2015. Semi-structured focus groups were conducted, one in each of the four participating institutions with 36 first year class representatives participating from across a wide range of disciplines. In addition, an online survey instrument was designed and deployed to academics teaching first years students. 213 (30% of target population) staff participated in the online questionnaire, which sought to explore staff perceptions of feedback and feedback practices in first year. This aspect of the study has been reported in a recent publication ‘Feedback in First Year: A landscape snapshot’ (Y1 Feedback, 2016a). Phase two of the project involved undertaking a
review of current literature in order to inform the design of case studies in each participating institute. Findings are reported in a second publication ‘Technology-Enabled Feedback in the First Year: A synthesis of the literature (Y1 Feedback, 2016b). The final phase of the project involves the implementation and evaluation of case studies involving technology enabled feedback and further dissemination of findings. 20 case studies are in progress across the four partner institutions, which are due for completion in January 2017. The case studies are being developed in partnership with 32 academic staff across 16 different disciplines with class sizes ranging from 10 to 750 students.

Key findings and discussion

The snapshot of current practices revealed interesting findings. In relation to staff and student perspectives there emerged a shared value amongst both staff and students of feedback and the importance of feedback conversations. However, it also was apparent, in keeping with the findings from ISSE, that students’ experience of feedback in first year is inconsistent. Indeed, dissatisfaction around the timing, quantity, and quality of feedback was also reported. Interestingly, students reported low use of formal peer involvement in feedback. Findings also suggested that, although there were some examples of the use of technology, in general this was limited. Staff when queried in relation to their lack of engagement with feedback suggested challenges such as lack of time, heavy workload, large classes, and a dissatisfaction as a result of the lack of student engagement when given feedback. Some key suggestions emerged which were, to develop consistency in the provision of feedback ideally using a programmatic approach and, that students would like to receive more feedback that is timely. The synthesis of literature provided current thinking of feedback in first year and the role it plays in transition pedagogy. In summary, it provided some key recommendations for implementing contemporary approaches to feedback that underpin the selection and implementation of the case studies.

These are that feedback should:
1. Take place in formal and informal learning settings beyond assessment;
2. Feed forward to future work; and
3. Be a dialogic process that ultimately supports learners to become self-regulating.

Specific strategies for implementing the features of effective feedback include: informal feedback; peer feedback; marking guides, rubrics and exemplars; in class dialogue and feedback; feedforward strategies; generic feedback; anticipatory feedback and programmatic approaches. In addition, it is suggested that the affordances and benefits of technology supported feedback which may help address the issues and challenges previously outlined in terms of timeliness, variety and consistency. The final phase of the project during which the case studies are being implemented will address the initial aim of the project and will be disseminated through the publication of individual reports. The case studies selected for implementation and review in AIT are outlined in figure 1.

The TEAM Project – research problem

In Science & Health programmes, acquiring practical skills in addition to experimental theory, is crucial to ensuring student learning and employability. The Institute of Technology (IoT) sector in particular places a major value on producing graduates who are ‘workplace ready’ with an emphasis on developing practical skills. Recent changes to government policy has led to the publication of the “Technological Universities Bill” (DES, 2015) which will allow for up to ten IoTs to merge as Technological Universities with “a systematic focus on the preparation of graduates for complex professional roles in a changing technological world” (TU4Dublin, 2015). In addition, it is widely recognised that assessment is an important influence on student learning, affecting engagement and motivation, effort and performance (Gibbs & Simpson, 2004; Carless, Salter, Yang, & Lam, 2011; Boud, 2014).

Aim

The Technology Enhanced Assessment Methods (TEAM) for Science and Health project aims to (i) develop a framework for applying the principles of good assessment and feedback to practical assessment, (ii) use digital technologies to enhance practical assessment and (iii) facilitate dialogue among stakeholders about what students should learn in practical classes and how assessment can facilitate this.
Research Methodology

Commencing in 2016, the first phase of the project involves eliciting feedback from key stakeholders: students, staff and employers using a mixed-methods approach. This element of the project is currently ongoing. Eight hundred students from the participating departments across all four participating institutes will be invited to complete an electronic survey. The survey design included questions about students’ experiences of practical assessment, their attitudes towards it, satisfaction with it, suggestions for enhancement and use of digital technologies in assessment.

Other key stakeholders who will be included in the collection of data will be teaching and support staff in the relevant departments. In addition, employers nominated by each institute will inform work ready practices. Together with the extensive literature review, the analysis of data from stakeholders will inform the development of a number of technology-enhanced assessment approaches to be piloted and evaluated in phase 2 of the project in 2017.

Results

A comprehensive review of literature has been undertaken initially, with a model for the critique of current practice and the design and evaluation of technology-enhanced assessment practices emerging, as indicated in figure 2. This model which incorporates key elements to consider when reviewing pedagogy and assessment practices in practical settings when combined with current classroom technologies will be used to inform phase 2 of the project.

Contribution of both studies

The Y1 Feedback Project is already contributing to practice and curriculum enhancements involving supporting feedback practice through the use of technology. Current project publications will be of interest to those involved in supporting and promoting learning and teaching in higher education. This audience is not confined to a national one but extends to those with an interest in supporting first year transition and enhancing learning using an evidenced-based approach. Similarly, the TEAM Project identifies and shares best practice in technology supported practical assessment. In particular it is promoting and supporting cross disciplinary approaches in Science and Health disciplines evolving through the identification of priority themes. This project has the potential for curriculum enhancement beyond the four participating IoTs.

The Irish higher education has recently endured significant cuts in funding due to the economic downturn (Humpheries, 2015). However, it is evident in AIT that the process of engaging staff in curriculum enhancement projects provides a conduit for the development of their digital literacies underpinned by scholarship. This approach has been identified as a model for 21st century higher education (Laurillard, 2008; JISC 2014). In addition, the benefits of working collaboratively in shared endeavours are apparent. In so doing, both projects are developing sustainable and scalable processes with a focus on capacity building.

A key impact has been the approach adopted of designing-in the engagement by key stakeholders with a framework emerging for how this can be replicated in order to inform and drive future curriculum enhancements. Both projects are developing a model for using a ‘Students as Partners’ approach when engaging in curriculum enhancement initiatives. This involves the engagement of student ambassadors in both national projects to inform and contribute to all project phases. Student engagement is also an essential element of the current practice review, the development of publications and the implementation and evaluation of case studies. In addition, the involvement of international experts has also been a key feature of both projects. This has occurred formally with project teams inviting experts to provide feedback during each of the project phases. In addition, the bi-annual progress report presentation, required by the awarding body, NFETL, involves an international panel with the reports subsequently published to inform future planning.

Conclusions

This paper has outlined the context for the design and implementation of two multi-institute national projects that focus on enhancing curriculum design and the development of digital and assessment literacies.

The paper explored how both projects are supporting the realisation of national strategic objectives and are used to leverage curriculum enhancement. It is evident that using a collaborative and evidenced based approach both
projects are providing a catalyst for change and developing enhanced pedagogy. The deliberate engagement of students as partners and, the development of digital and assessment literacies amongst staff and students will assist in developing the digital experience for students in Irish higher education. In doing so both projects have the potential to make key contributions in enhancing curriculum design and informing the development of pedagogical, digital and assessment practices in a variety of settings.

Figures

<table>
<thead>
<tr>
<th>Case Study Title</th>
<th>Technologies</th>
<th>Discipline</th>
</tr>
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<tbody>
<tr>
<td>Clickers for Dialogic Formative Feedback in large Humanities Classroom</td>
<td>Classroom response systems</td>
<td>Social Care</td>
</tr>
<tr>
<td>Screencasting Rich Summative Feedback on handwritten lab reports</td>
<td>Screencast-o-matic, Document camera</td>
<td>Business</td>
</tr>
<tr>
<td>Use of E-portfolio Software to map Student Competences and enable Timely Dialogic Feedback for Work-based Learning in a Social Care setting</td>
<td>Student Diary Pro</td>
<td>Social Care</td>
</tr>
<tr>
<td>Moodle Assignment Feedback Dashboard</td>
<td>Dashboard</td>
<td>Business</td>
</tr>
</tbody>
</table>

**Figure 1. AIT Y1 Feedback Project Case Studies**

![Format & Design of practical session](image)

**Figure 2 Baseline analysis: literature review (TEAM, 2016)**

Acknowledgments

The author wishes to acknowledge the contribution of colleagues involved in the national project teams. Lisa O’Regan, Maynooth University, leads the Y1 Feedback Project and the Technology Enhanced Assessment Methods (TEAM) for Science and Health is led by Dr Edel Healy, Dundalk Institute of Technology.

References


A Case Study on an English Preparatory Programme: Recommendations from Former Students

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Abstract

Designing an appropriate English language preparatory programme for prospective international students, who aim to obtain a degree in a Malaysian public university, can be a challenging task. The complexity involved in designing the curriculum for Intensive English Preparatory Programme (IEPP) was evident when myriad factors, such as financial and time constraints and students’ varying levels of English language proficiency, exert valid demands on the programme. After having implemented the Intensive English Preparatory Programme (IEPP) for four cohorts of international students within two years, a survey was conducted via a questionnaire among 70 former IEPP students to garner feedback on IEPP for the purpose of improving the programme. Although respondents’ feedback has revealed its strengths and weaknesses, only their valuable recommendations are discussed in terms of its duration, timetable, contents, co-curricular activities, teachers, and facilities. With this student-centred approach to programme evaluation, the programme may be fine-tuned for improved effectiveness in order to benefit future students.

Keywords: English preparatory programme, international students, curriculum

Introduction

The Intensive English Preparatory Programme (IEPP) serves as an alternative platform for undergraduate and postgraduate students to obtain the pre-requisite for English language, which is either a band 5.5 for IELTS or a score of 550 for TOFEL since its inception in March 2014 until August 2016, about 83% of IEPP students have successfully enrolled into UMS. The duration for IEPP is four months which are divided equally into two phases. The first phase comprises five modules at the low-intermediate level whereas the second phase comprises five modules at the intermediate level. The foci of these modules include Grammar and Vocabulary, Listening and Speaking, Reading and Writing, Public Speaking, and English for Academic Purposes. Classes are held 8 hours per day from Mondays to Fridays. Students learn two modules on each day. In order to gain an insight on end-users’ recommendations for the programme, a survey among the former IEPP students who are studying in the UMS Kota Kinabalu campus was conducted.

Research Problem

For an English language programme to be competitive in the global market and appealing to international students, measures for continuous improvement are indispensable. Throughout the implementation of IEPP for the different cohorts of students, it can be observed that students’ motivation to attend classes and their attitude while in class seem to decline, especially during the second phase. Lethargy and loss of interest are evident among majority of the students and teachers face an uphill challenge to obtain their attention and willingness to participate in the learning process. As this problem significantly affects students’ academic performance, measures must be taken to halt the downward trend in students’ motivation and results.

Objective of the Study

Among the initial measures taken to examine the negative behavioural trait of IEPP students towards their study, a survey was conducted among former IEPP students. (McKay, 2009, p. 10). Students are frustrated or dissatisfied;

- Evaluate recent changes in a program;
- Identify aspects of the program that should be reconsidered or changed;
A part of the survey is to achieve the following objective:

1. To obtain former IEPP students’ recommendations on curriculum contents, co-curriculum activities, and learning support.

Research Methodology

One effective means of attaining valid feedback on the programme is to conduct a survey among former IEPP students. Wylie, et. al. (2012, p. 105) justified the validity of student-generated information by emphasizing that they are engaged in providing feedback in a similar manner as external observers would be. A convenient sampling of 70 former IEPP students who are in their first semester at Universiti Malaysia Sabah from the Kota Kinabalu campus was selected to be respondents in this survey. The sample constituted 60% of the total population at the time when the study was conducted. The respondents comprised 67 former IEPP students from China, two from Cambodia, and one from Korea. There are 25 female and 45 male respondents whose ages range from 16 to 26 years old. The majority of them are from 18 to 20 years old. The faculties involved are FPEP (62 respondents), FPP (3), FSSA (3), FKI (1) and FSMP (1). This implies that about 93% of the respondents are in the arts stream while 7% of them are in the science stream.

The instrument is a questionnaire which comprises three parts. Part A elicits ethnographic information from the respondents. Part B lists six features related to IEPP and requires respondents’ objective opinions. These features include duration of IEPP, venue, timetable, teachers, textbooks, and modules. This part is similar to the use of a Likert Scale but respondents are required to select and write an option from four options given, namely very good or very suitable, good or suitable, not good or unsuitable, very bad or very unsuitable. They can support each selection by writing their comments or opinions. Part C comprises five open-ended questions on respondents’ knowledge gained during IEPP, their learning needs in terms of facilities, the strengths and weaknesses of IEPP, and their recommendations.

The survey was conducted by the researcher who distributed the questionnaire to the respondents after their Malay classes. Explanation was given to the respondents on how to fill the questionnaire and they completed the questionnaire within half an hour. A quantitative approach via descriptive statistics, which involves percentile, mean, and ranking, was taken to analyse the data obtained for Part B. On the other hand, a qualitative approach was utilised for Part C because the data were collected via open-ended questions.

Results and Discussion

Since the focus of this paper is examining measures to improve IEPP from former students’ viewpoint and due to spatial constraint, only the respondents’ recommendations are highlighted. The weaknesses of the programme are embedded in the recommendations because these negative aspects are counter-acted upon in respondents’ suggestions. The recommendations are discussed in terms of six aspects: duration, timetable, contents, co-curricular activities, teachers, and facilities.

(i) Duration of programme

Many respondents were of the opinion that there should be no classes held during the weekends and the eight-hour lessons per day should be reduced. Some respondents suggested that the duration of IEPP should be at least full four months or five to six months or even a year. They also proposed that if IEPP is conducted for six months, the class time per day should be five to six hours and there should be no classes during the weekends. Another recommendation is for the IEPP to begin earlier so that there would be sufficient time for vacation before enrolment into UMS. Some respondents predicted that more IEPP students could pass and study in UMS if IEPP is conducted within full four months instead of 3 ¼ months as it is currently implemented. This scenario has occurred regularly due to students’ late arrival at Kota Kinabalu which resulted in the belated commencement of classes.

Sample proposed duration for IEPP:

1. IEPP should be longer than 4 months; can be five / six months (2) or maybe one year but less than 8 hours per day.
2. Full four months (2)
3. IEPP should start early and end early. Then, more students can pass and study in UMS.

Note: (n) denotes the number of respondents.
(ii) Timetable

A majority of the respondents proposed a reduction in contact hours per day from the existing eight hours to a maximum of six hours. To reduce the problem of sleepiness while in class, a few respondents recommended classes to commence at 9 o’clock in the morning instead of the present 8 o’clock. They also suggested a longer lunch break from the current one hour to a maximum of two hours as they would need more time to have their meals and take their rest. In addition, they strongly appealed for classes not to be conducted during the weekend so that they could have time to invigorate themselves, revise their lessons or complete their assignments. They had to attend replacement classes during the weekends because the commencement of classes was delayed. One of respondents put forward the proposition that the current three-hour lessons should be reduced to two hours instead.

Sample proposed timetable:
1. We want six hours of study per day (2); reduce time for studying in one day; shorter hours per day.
2. 8am - 11am (Lunch 11am to 1pm) 1pm - 6pm; longer lunch time; begin class at 9am (2) so that students can have a good sleep.
3. Do not have classes during weekends / on Saturdays (3).

(iii) Contents

The respondents made several recommendations on how to improve the existing contents of the curriculum. Firstly, a number of respondents emphasised that there should be more communication practice and motivation in speaking English as well as assistance provided to improve students’ role play assessment. Secondly, more listening practice is necessary because students are weak in this skill. While a majority of the respondents prefer a less taxing assignment load, there are a few of them who proposed more exercises or homework. These particular respondents also suggested raising the level of difficulty of IEPP modules, for example, Listening and Speaking 1 as well as Grammar and Vocabulary 1 and 2. Thirdly, a respondent advocated more time to be allocated for English for Academic Purposes modules because the knowledge and skills of reading and writing academic texts are pertinent for students to perform well in their further studies.

Fourthly, another respondent recommended that online learning should be conducted because students can access the online materials to assist them in their learning by enhancing their understanding and reinforcing their knowledge. Fifthly, two respondents pointed out that IEPP curriculum should include introduction to courses taught in programmes they have selected to study in UMS. Their rationale for this suggestion was that the implementation of this proposal would facilitate students’ understanding and enhance their learning of these courses. Consequently, they would perform better academically. Sixthly, students should be assessed individually to ascertain their command of English. Furthermore, stringent measures should be undertaken to ensure that only students who have attained the qualified standard of English language proficiency are allowed to study in UMS.

Sample recommendations for curriculum contents:
1. Provide more communication practice in English; communication must be in English; help students to be good at role-play; I think IEPP should have more things in English to make students speak in English.
2. Increase listening skill because students are weak in listening to English.
3. The content of class can be harder; make Listening and Speaking modules harder.
4. Have the online class will be better. If we can’t understand in class, we can study in online class by ourselves.
5. Some introduction to courses that students will study in UMS (2); not only teach students English.
6. Less homework to enable students to have a good rest which would refresh them and it is good for them to study; reduce some pages for Grammar homework (can’t finish the whole book).
7. Do more homework (3); give more exercises.
8. Make it harder for students to pass IEPP because their knowledge should go further and deeper (2) / need to be stringent – students with poor English should not be passed; test students one by one in class.
9. Slow down! Especially in Phase 2!
10. More time for EAP because it is more useful.
(iv) Co-curricular activities

A majority of the respondents recommended more activities which may be outdoor and focus on team work. A respondent suggested an essay writing contest or a calligraphy competition to encourage students to use English. Many of them expressed the need for more holidays.

Sample recommendations for co-curricular activities:
1. Organise more activities (10) for students to participate.
2. Conduct more outdoor activities to practise team work.
3. Have more holidays (3) / vacation.

(v) Teachers

Despite the absence of negative comments on IEPP teachers, individual respondents proposed the following requests:
1. Focus on student’s abilities of English.
2. Try to communicate more with students.
3. The teachers should be serious with the students.
4. Some of the teachers who know Chinese shouldn’t speak Chinese in class.
5. Teachers can use simple words to teach so that students can understand.
6. Teachers should tell us what is useful for us to study in UMS so we can pay more attention or spend more time on it.

(vi) Facilities

A majority of the respondents proposed that free wifi access should be made available in the classrooms and at their hostels to enable them to obtain the required information for their learning and assignments. They also expressed the need for a more conducive learning environment with better air conditioning facilities, lighting, comfortable chairs and tables in the classrooms, and well maintained equipment (e.g. LCD projectors). A few respondents prefer a change of venue for accommodation and lunch to be provided. They also highlighted the need for a better bus that offers punctual services.

Sample recommendations for facilities:
1. We should pay more attention to students’ learning environment: wifi, better air conditioning, more tables so each student could have a table with a comfortable chair; and update devices.
2. Change the place for hostel.
3. The bus must be punctual every morning.

Contributions of the Study

The recommendations highlighted can collectively create a quality learning environment that comprises the classroom, school [or institution in this case], community, and culture (Killen, 2007, p. 35). Based on the feedback from the former IEPP students, the following recommendations should be taken into consideration when designing an improved version of the English preparatory programme:

1. Lengthen the duration of the programme to six months with six hours of lessons per day and no lessons during the weekends.
2. Revise the timetable and arrange a longer lunch break.
3. Provide well maintained teaching equipment and air conditioning, suitable tables and chairs.
4. Prohibit teachers from using Chinese during IEPP lessons and reduce its use as a means of communication with students outside the class time. Instead, they should utilize other means to facilitate students’ understanding of the contents taught.
5. Provide free access to the Internet and supportive learning materials, communicative practice in English, and fun activities related to learning English.
6. Provide opportunity for online learning.
7. Introduce students to their prospective programmes.
8. Conduct extra-curricular activities after lesson time.
9. Reduce the lapse of time between the end of IEPP and the commencement of the UMS semester.
In addition, these findings can be incorporated in any English preparatory programme for English as a Second or Foreign Language (ESL or EFL) learners to “enhance student learning, engagement, and satisfaction” (McNay, 2009, p. 10). Furthermore, the eighth recommendation enables international students to make “horizontal connections (linking what students learn to the wider environment and society)” (Review and feedback process, n.d., p. 3). This is vital for them as they need to be acquainted with a foreign environment and adapt themselves through these informal learning opportunities.

Conclusions

The respondents contributed valuable insights about IEPP and recommendations on how to overcome the shortcomings of the programme, such as insufficient time to rest due to an overly intensified schedule of lessons and assessments, lack of extra-curricular activities, and difficulty in accessing the Internet. As highlighted by Norris (2008, p. 27), change in curriculum is a necessity to meet the shifting needs of learners although it is a difficult process, especially for the change to be of real significance. It is hoped that appropriate follow-up measures can be taken by relevant authorities in recognising the learner role in each international student and respect fully adjusting to meet their diverse learning needs (Leask, 2013, p. 96). Consequently, prospective students will gain a better command of the English language within a more supportive and quality learning environment and hence, be better equipped to further their studies in UMS.

References

Micro-Learning - Adopting Digital Pedagogies to Facilitate Technology Enhanced Teaching and Learning for CPD

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Abstract

In the midst of growing transformation, many within higher education cling resolutely to more familiar structures and delivery models, having little but a cursory regard to the events which are unfolding. This paper seeks to highlight the various potencies which are hastening fundamental change within higher education, particularly with regard to the provision of continuing professional development (CPD). It encourages the adaptation of appropriate pedagogies designed specifically to facilitate technology-enhanced teaching and learning methodologies, reflecting the cognitive and collaborative learning modes of current and future learners. Ultimately, the evidential content suggests the necessity to embrace educational technological affordances in order to support the evolution of higher education.

Keywords: technology-enhanced learning, e-learning, micro-learning

Introduction

As technology and its affordances continue to evolve, new skill-sets are required in order to maintain and ameliorate growth rates within the economy. Rapid technological changes dictate the demands of the knowledge economy and there is a constant need to maintain skills at the optimum level. While developments in technology offer boundless opportunities to enhance and increase access to educational content, this can only be achieved successfully within the context of appropriate pedagogical design.

Technology Enhanced Learning in Ireland

A study from the National Forum for the Enhancement of Teaching and Learning in Higher Education (NFETL, 2014b) has identified the genuine desire amongst Irish educators to effectively utilise technologies to enhance and support their teaching and learning practice, both amongst the educators themselves as well as on the part of the Universities, Schools and Institutions in which they work. Indeed, the report notes that despite some concerns related to best use of technology in teaching and learning, there is “a widespread commitment to utilise its potential to support and engage students and their learning”. In addition, in a survey conducted to determine the use of technology for teaching and learning in higher education, 79% of the “enthusiastic users of TEL” acknowledged receiving encouragement from their institute to use technology in their practice (NFETL, 2014a).

Despite these assertions, however, a number of barriers and challenges still limit the effective use of technology for teaching and learning. Results from the NFETL (2014a) nationwide survey distinguished a wide range of challenges which Irish educators are required to deal with when attempting to effectively utilise a technology-enhanced learning (TEL) based approach. Notably, the report identifies that the main barriers are a “lack of training and insufficient time to engage in TEL [and lack of] awareness regarding the potential of TEL and confidence in the availability of technical support”. Laurillard (2002) emphasises that “technology can do only so much. On its own, it cannot offer academics what they need to adapt their teaching to the needs of the digital age”. The author also notes the significant time pressures burdening academics in terms of related research requirements and increasing student numbers and class sizes, which have often resulted in academics being unable or unwilling “to go beyond the traditional forms of academic teaching”. In an age when upskilling in the
use of evolving technologies is crucial for economic growth, more continuing professional development (CPD) and lifelong learning opportunities can positively impact on both educators and students.

What emerges from all of the above is a situation whereby the benefits of TEL are recognised and desired, both by individual educators and institutions as a whole, but where fundamental factors in the provision of information and effective training on TEL are under-addressed. In this situation, individuals remain unaware of the benefits of TEL and remain unable to effectively utilise technologies and systems for the purposes of teaching and learning.

The Need for a Pedagogical Framework

In its Report to the European Commission (2014), this High Level Group observe that “new technologies and associated pedagogies require a very different skill-set from more conventional teaching” the contributors also point out that “academic staff are not all technology experts and in many cases, they have not received any form of pedagogical training at all”. Similarly, Conole, et al (2004) state that “practitioners are still unclear about how to use technology appropriately, and its application is often based on common sense rather than being theoretically informed by pedagogical theory”.

While most academics would apply familiar methodologies in the preparation and delivery of their subject-content, the utilisation of new technologies affords new approaches to teaching and learning which are complemented by knowledge of learning theory and pedagogy. Conole and Dyke (2004) conclude that “there has been a realisation that the development of content alone does not lead to more effective learning, and that there is a need to structure and foster learning environments to enable communities to develop”. Similarly, Harris et al (2009) note that because the “continual evolution of technology, pedagogy, and content often brings new learning activity types to light… [there are] new ways of representing content, and new ways of helping different students learn it’ made possible through the combined efforts of “content experts, educational technology developers, educational researchers, and pedagogical practitioners”.

Micro-learning

In keeping with these difficulties encountered by professional educators, Buchem and Hamelmann (2010) note that traditional classroom-based training and longer-term web (frequently LMS-based) training can often be oppressive and unwieldy and the time and attention demands on the working professionals who comprise the learners in these scenarios can be considerable. As a solution to this, micro-learning, described variously as “measurable”, “short”, “simple”, “nuggets” of information (Hug, 2005, pp. 4-5) that “concentrates on structuring and syndication of information” (Kahnwald & Köhler, 2015, p. 158), can provide an alternative to more rigid forms of CPD learning. Micro-learning can facilitate an approach more suitable to fast-paced and multitask-orientated patterns of working (and consequently, learning) as learning can be completed using small units of content engaged with over a number of small steps.

Hug and Friesen (2007) note that micro-learning can “be utilised with a range of pedagogies, including, selective, pragmatist, conceptionalist, constructivist, connectivist or behaviorist learning or action-, task-, exercise, goal- or problem- orientated learning”. This flexible nature facilitates its benefit for CPD. Robes (2009) also identifies that micro-learning can even potentially be used to compliment, rather than replace, more formal, time-consuming means of learning, further indicating the flexibility of the approach.

The “TEL Tools” Project

The “TEL Tools” project aims to meet the challenge facing TEL training for educators by developing teaching and learning resources that will equip instructors with the tools and knowledge required to utilise tools and resources for TEL in an effective and practical manner through a micro-learning based approach. The primary output of the project is an online platform (available at http://telu.me/), which has a specific focus on assisting instructors in identifying, selecting and utilising technologies that can support and enhance their teaching and learning practices; and in doing so, matching the technological requirements with the pedagogical requirements.
“Micro-lessons”

Learning content in the telu.me platform is based entirely around the provision of micro-learning objects, referred to in the platform as "micro-lessons". Each and every micro-lesson is designed to provide practical information to the viewer on how to effectively support or enhance a specific teaching/learning approach using an appropriate digital tool or technology.

The structure and information contained in each micro-lesson is designed as a series of questions, explaining:

1. "What is this tool/technology?"
2. "Why should I use this tool/technology for teaching and learning?"
3. "How can I use this tool/technology for teaching and learning?"
4. "Where can I get this tool/technology?"
5. "How do I get started with using this tool/technology for teaching and learning?"

In addition to the above, each micro-lesson also provides a range of resources to help assist the viewer in using the given tool/technology for the specific teaching or learning activity.

The short duration and specifically focused content of each micro-lesson aids in the “digestion” of the learning content by the user, providing them with specific information related to what the tool or technology is, and how it can be put to use for teaching and learning purposes. The design for the platform’s micro-lessons ensures that the application of the tool or technology in a specific teaching or learning activity is always the focus. This also serves to outline to the user the potential offered by specific tools and technologies and how they may be used for educational purposes. At no time is the user “in the dark” as to how to leverage a given technology to their educational practice.

All of this is designed to address the barriers to TEL training faced by many educators - allowing them to access and acquire the learning information quickly and providing them with the relevant information in an understandable fashion with a practical approach to implementation and application. Furthermore, the provision of additional resources in each lesson provides the educator with additional technical guidelines which they can use to extend their knowledge beyond lesson content.

“Micro-Courses”

Learning content in the platform is organised in a logical taxonomy. In addition to the use of micro-lessons focused on a specific tool or technology used to support or enhance teaching and learning practice, the platform can also facilitate the application of larger learning outcomes by offering combinations of micro-lessons, titled “micro-courses”. These are composed of multiple relevant micro-lessons. If a single micro-lesson seeks to educate a user on, for instance, how to use collaborative writing software to facilitate student collaboration, a micro-course may aim to educate the user on how to facilitate students in mind-mapping an idea for a group report (using online mind-mapping software), then organising themselves (using online time management tools) and finally collaboratively writing a report (using collaborative writing software).

The taxonomy is further exploited by presenting “paths” to learners. These paths are composed of very specifically curated content - multiple micro-lessons and micro-courses and are designed to address even larger learning outcomes than micro-courses (e.g.: a full overview of how one can use multiple communication tools or technologies within and outside of the classroom). Paths can therefore be developed and curated in order to address the needs of very specific individual requirements.

This use of multiple types of learning objects, each facilitating a different “level” of learning outcome (related to TEL) provides a great degree of flexibility to users of the platform, allowing them to undertake quick, focused training related to the use of a specific tool or technology for a specific learning activity or alternatively, allowing them to undertake more extensive training to allow them to integrate numerous tools or technologies into their practice to implement larger changes.
Conclusion

As outlined earlier, the difficulties facing educators seeking to engage in TEL training is not insubstantial. Familiar structures and delivery models have thus far proven ineffective and dramatic changes would appear to be required in order to effectively facilitate training. Although educators may rely on the familiar methods of education which they themselves utilise to facilitate learning, there is significant weight to the suggestion that the training of educators in TEL would be best served by effective practices from the area of CPD and lifelong learning. To this end, the strategy of micro-learning, outlined above offers an opportunity to educators to engage in unobtrusive yet effective work-based learning, due to the approach’s inherently flexible and granular nature - facilitating a number of different pathways for learners. The telu.me open online platform seeks to utilise this learning strategy in order to provide educators with training on effective TEL practice and tools, while ensuring that the pedagogical implications of the practice in question remain at the forefront of the learning. Despite this, however, the role of the broader educational institution cannot be underestimated in terms of its connection in implementing, enabling and encouraging support for TEL training and approaches. As with effective CPD practice, staff need to be given time and encouragement, not just to undertake training, but to determine for themselves how this training can be used to benefit their own teaching practice.

References

Assessment for Learning and How It Influences Students’ Learning

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Abstract

This paper focuses on how students approach learning and studying in an Irish Higher Education institute, and investigates whether these approaches are dependent on the learning environment. Each approach – deep approach, surface approach, effort and organisation, and monitoring studying – will be considered from the student perspective using data collected via survey, classroom observations and focus group. The deep approach to learning and studying is considered appropriate in higher education so the student perspective on this will be explored in detail. Two different learning environments, assessment for learning (AfL) and non-AfL, underpin this paper, so the attributes of each will be explored from the students’ viewpoint. Finally, my findings suggest that it is the assessment for learning environment that produces the higher grade which may keep the student happy, but is it educationally worthwhile?

Keywords: Assessment for Learning, Student learning, Learning Environment

Introduction:

This research relates to the assessment practices within the Business School at a Higher Education Institution located in the South of Ireland. The study is primarily concerned with assessment for learning (AfL) and how it is perceived by students. The aim of the study is to investigate if assessment for learning acts as a springboard or straitjacket for educationally worthwhile learning (Davies & Ecclestone, 2008). In doing so, the study attempts to uncover if and how assessment for learning practices influence student learning.

Research Problem:

Assessment in any education system plays a central role. It has come to underpin or even dominate all aspects of teaching and learning and how students perceive programmes and modules (Carter, 2012). It is not a new phenomenon; some thirty five years ago Derek Rowntree, while discussing the influence of assessment on student learning, commented:

‘If we wish to discover the truth about an educational system, we must look into its assessment procedures. What student qualities and achievements are actively valued and rewarded by the system? How are its purposes and intentions realized? To what extent are the hopes and ideals, aims and objectives professed by the system ever truly perceived, valued and striven for by those who make their way within it? The answers to such questions are to be found in what the system requires students to do in order to survive and prosper. The spirit and style of student assessment defines the de facto curriculum’. (Rowntree, 1977:1)

Some twenty one years later Black and Wiliam (1998) focused their research on assessment in the primary sector. Their ideas and insights had a strong resonance in higher education. The term ‘assessment for learning’ was coined, again highlighting many of the questions raised previously by Rowntree (1977), with the resulting research concentrated more on classroom practice at all educational levels. Practices linked to AfL include questioning, feedback, sharing criteria, peer- and self-assessment. These alone may not lead to AfL. It is how the practices are interpreted and implemented that determines whether or not they encourage a deeper learning approach. Implementation of these practices ‘becomes much more than the application of certain procedures…but about the realization of certain principles of teaching and learning’ (Marshall and Drummond, 2006:135). It
is only then that the full educational benefits of AfL will be achieved (James and Pedder, 2006) and the benefits for students realised.

These assessment practices influence how students approach their learning, in the words of Rowntree (1977) what does the student need ‘to do in order to survive and prosper’ (1977:1). If the assessment regime rewards rote learning, why would the student approach his/her learning in any other manner? Yet this surface approach (McCune, 2003) to learning is considered by Vermunt (1998) as inappropriate for higher education. Instead, what is seen to be desirable is the deep approach (McCune, 2003) where the student tries to understand and take meaning (Trigwell & Ashwin, 2006) from the learning moment. According to the advocates of AfL the deep approach to learning is more likely adopted when an AfL environment exists.

Objectives of the Study

The above outlines the significance assessment has had on the educational discourse policy and practice over the past two decades, and how the assessment regime can influence students. Enacting assessment for learning practices are purported to enhance teaching and promote a deeper learning experience for students but doing so is not straight forward. Set in the context of a Business School, my study aims to explore some of the tensions relating to students’ perceptions of assessment for learning. These tensions include the theory practice divide, the enactment and implementation processes, and how these influence the students’ approaches to learning. To this end, the research questions which form the basis of this study are stated below.

- What are the implications of assessment for learning practices for students’ learning?

Research Methodology

The object under investigation is the learning environment that helps or hinders AfL bounded within an Irish Higher Education institute, my workplace. Having an object and placing it in a context is what makes this study a ‘case study’. The flexible approach to the data collection phase, afforded by the case study approach, was demanded by the research questions as outlined in the introductory section of this chapter. I aim to gain insight into how people behave, feel, think, i.e. the things that contribute to the creation and shaping of a learning culture, and these can only be understood by getting ‘to know their world and what they are trying to do in it’. With this in mind, participants for the study were considered. The participants are all based in the Business School but what makes this a case is the focus being placed on their practices and perceptions of AfL and the interaction of these in particular learning cultures.

Given the large cohort of students, the obvious method of ascertaining their views on AfL was via a survey instrument. O’Leary (2010) did outline how the use of the case study allowed researchers to break through the quantitative/qualitative divide. This instrument covered factors relating to influences on student learning – approaches to learning; teaching, assessment and learning environment. Observing students during class time and focus groups will further my understanding and deepen the knowledge gain through the survey.

My student population was chosen following the pilot study when it was decided that students in the third year of their programme would be suitable candidates as they have the necessary experience of both AfL and non-AfL modules, thus using purposive sampling techniques. Purposive sampling may be defined as ‘selecting units (e.g. individuals, groups of individuals, institutions) based on specific purposes associated with answering a research study’s questions’ (Teddlie & Lu, 2007:77), or ‘simply put, the researcher decided what needs to be known and sets out to find people who can are willing to provide the information by virtue of knowledge or experience’ (Tongco, 2007:147).

With over 200 survey instruments to analyse, the key is to ‘stay on top of it the whole way through your analysis’ (O’Leary, 2010:230). The ‘user-friendly’ computer package, SPSS (in line with the original study from which the survey instrument was adopted) was employed to store, manage and analyse the data. As with other types of qualitative data, observational data is traditionally analysed as it is collected – we humans do not have the ability to disengage our thinking processes when listening to and observing particular settings. Working with the field notes requires ‘drilling in and abstracting out’ (O’Leary, 2010:263) meanings achieved using a reflective analysis process. Similar to that used to analyse the data collected using the survey method, but rather than using statistics as an aid to interpretation, with observational and focus group data thematic analysis was used. ‘Thematic analysis is a method for identifying, analysing, and reporting patterns (themes) within data’,
Results/Discussion

‘A key purpose of the questionnaire was to see whether students responded differently to AfL and non-AfL modules’ (McDowell et al, 2011:755). Analysis of the survey findings suggest that students do not distinguish between differing assessment and learning environments. Table 1 depicts the conditions for an AfL environment, the mean scores and the standard deviation, calculated from my data, attributed to each.

Analysis of the focus group data and the observation of classroom practice however reveal a different picture. The focus group participants had never heard of the terms formative assessment or AfL with one student asking ‘isn’t that the fancy term for CA?’ If that is so, they believe that AfL classes are more interactive and that ‘you learn more in a CA classroom’ while in a non-AfL classroom ‘you are just going through the motions’.

Observations of the AfL module classroom did satisfy the conditions and highlighted an environment that is rich with informal feedback, students applying knowledge skill and understand to authentic tasks with a balance of summative and formative assessment.

On first reading the literature in this field, it is the deep approach to learning that is required in higher education, so as providers of higher education we must transform the learner from one who adopts a surface approach to what is appropriate at this level. The majority of the students in this Business School have been awarded for their surface approach to learning/instrumental learning at second level and as stated above, the transformation to a different type of learning is a gradual process. This process should be concluded by third year I suggest, but from the students’ perspective this does not seem to be so.

For non-AfL modules where the assessment methods is the traditional end of semester exam, students rote learn – memorising and regurgitate information – because they have little time for anything else, the AfL module assignments take up so much of their time. Is this due to the effort and organisation skills, or lack thereof, of our students? The focus group did suggest otherwise, but I posit that the students who were willing to participate in a focus group are committed to their studies in the first instance and it is the survey and classroom observations that show the true reality.

Glimmers of hope shine from the AfL modules for the surface/deep divide, where students relate their learning to the wider world and become actively interested in the course content. However this only occurs when instructed and prompted by the lecturer, so while the lecturer is trying to influence students to adopt the deep approach to learning, the lecturer dependency issue is raised again, illustrating that our students are not independent or autonomous without the drive and motivation an enthusiastic lecturer provides.

Learner independency and autonomy are key components of deep learning. The opposite is true for surface learning. Distinguishing between the surface and deep approach to learning is extensively done in the literature yet my focus group findings show that students did not appear to understand the terms, or if they do it is not something they are concerned with as highlighted by ‘once we finish the degree we can worry about how we learn or study’ (FG 1).

Contributions of the study

This small scale study confirms the overuse of the term AfL to describe any form of assessment that is not the traditional end of semester examination, and it is the enactment rather than the implementation of the practices associated with AfL that may result in our students adopting a deep approach to learning. Practically, our students are viewed as consumers/customers, but they must take responsibility and be accountable for their own actions. What my findings suggest is that by becoming active participants in their classroom and in their learning may be the first step in that direction.
Conclusion

Evidence from my findings particularly classroom observations highlight two different learning environments which the students are engaged in. Each environment offered different teaching, learning and assessment styles, yet the level of ‘learned dependency’ was equal in both settings. In the context of this study, it appears that it is not the learning environment that influences learning, it is their ‘comfort zone’ that impacts on how our students approach their learning and extracting them from this is not easy. I suggest that the comfort zone of my student participants is restricting transformative learning and they graduate as obedient citizens from the ‘simplest form of higher education’ (Glisczinski, 2007:318).

According to research placing the student at the heart of the assessment process should influence how they approach their learning. Approaches to learning are discussed in the literature under four concepts, deep approach, surface approach, monitoring study and organisation and effort (McCune, 2003), with the deep approach being sought after in higher education. Despite being regarded widely in the literature as inferior to deep learning, the surface approach is not all bad insofar as it is used for understanding purposes. The findings from this study obtained via survey instrument, classroom observation and student focus group indicate that the majority of students do, in fact, adopt a surface approach to their learning. Again, in theory at least, the AfL environment should offer these students the conditions where the adoption of the deep approach to learning is encouraged.

This learning environment is determined by factors which include staff support and module design, engagement with subject matter and peer support (McDowell et al, 2011) and when these are constructively aligned lead to higher quality learning. This environment may not be suitable for all, but when used ‘in the right place for the right purpose’ can only benefit students.

Students participating in this study are currently offered two types of teaching, learning and assessment environments, namely continuous assessment and end of semester examination. Findings from the student perspective suggest that students learn better in the former environment with end of semester results confirming their perspective, but learning cannot be equated with results/grades. This type of learning is referred to by as learned dependency which may promote instrumentalism and not lead to educationally worthwhile learning.

Figures/Display Elements

Table 1 Conditions for an AfL Environment Mean Scores (findings from this research)

<table>
<thead>
<tr>
<th>Conditions for an AfL environment</th>
<th>AFL Module</th>
<th>non-AFL Module</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std Deviation</td>
</tr>
<tr>
<td>Formal feedback</td>
<td>2.28</td>
<td>0.917</td>
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<tr>
<td>Informal feedback</td>
<td>2.16</td>
<td>0.992</td>
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<tr>
<td>Practise knowledge, skills and understanding</td>
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<td>0.015</td>
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<tr>
<td>Assessment tasks which are authentic</td>
<td>2.37</td>
<td>0.946</td>
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<tr>
<td>Develop student autonomy</td>
<td>2.39</td>
<td>0.364</td>
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<td>Balance of Summative and Formative Assessment</td>
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<td>1.021</td>
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</table>

References


Engaging Students in Entrepreneurship Studies by Using Team-Based Learning in an Enterprise University

Peter Balan OAM  
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Abstract

Experience for yourself how Team-Based Learning (TBL) engages students in entrepreneurship studies! This well-established teaching method draws on theory and empirically-grounded practice. Students commit to their own learning and preparation. They are motivated to engage in give-and-take discussion in teams and in the classroom, and the educator’s role is to help to consolidate learning. This method engages students, is effective in larger classes, and has a positive impact on learning. The presenter has implemented TBL in more than 20 undergraduate entrepreneurship classes, and is an accredited TBL trainer and mentor.

Rationale for this workshop

Entrepreneurship is a complex field of study, and entrepreneurship education needs to be learner-centred (Jones and Iredale 2010) in order to foster engagement that will help to achieve learning objectives (Coates 2009).

Team-Based Learning (TBL) is a strategy for collaborative learning using student teams that are fixed for the duration of the course. Students learn prescribed course materials in advance of a teaching session. At the start of the teaching session students take an individual multiple-choice test on the prescribed content, followed by completing the same test as a team, using “scratch and win” cards to provide immediate feedback. This creates a motivational framework that encourages team interactions and productive individual and team learning (Michaelson and Sweet, 2008).

The test process for individuals and teams is followed by application exercises where student teams work on the same specific and significant problems and report their decisions simultaneously; this provides the basis for classroom discussion and elaboration. TBL also includes mechanisms for students to provide feedback on the contribution of their team members to teamwork. There is support for the value of TBL in engaging students (Balan and Metcalfe 2012; Kelly et al. 2005) and it has been found to achieve improved learning outcomes (Fatmi et al 2013, Tomcho and Foels 2012).

Important aspects of engagement with TBL have been identified, and these have enabled the refinement of this teaching method for entrepreneurship students (Balan and Balan-Vnuk, 2013). These aspects are highlighted in this workshop.
Ensuring Student Buy-in for Pre-Learning in Flipped or Team-Based Learning classes

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Abstract

Experience for yourself how to get student buy-in and engagement with teaching methods that expect students to pre-learn materials before a classroom session. In this interactive session, you are taken through the first session of a course that comprises exercises to help students identify for themselves their learning responsibilities and learning contracts. This session engages students in entrepreneurship courses, and gets effective student buy-in to a pre-learning teaching method (in this case, Team-Based Learning).

Rationale for this workshop

“Flipped learning” is becoming increasingly popular as a teaching method across a range of disciplines. It shares similarities with Team-Based Learning (TBL); both are forms of active learning, where students “do meaningful learning activities and think about what they are doing”, and where core elements are “student activity and engagement in the learning process” (Prince 2004, p.223). These are also student-centred learning approaches that lead to a deeper approach to learning by students (Marton & Säljö 1997). Both methods require students to pre-learn course materials before classroom sessions during which course content is developed and applied through a range of individual and team activities. (The main difference is that TBL provides a useable framework for in-class learning activities.)

Student “buy-in” and engagement is important, as students often experience a “culture shock” when they have only experienced traditional lecture delivery, and do not expect to be asked to work with material that has not been already presented in lectures.

The literature does not provide structured guidelines on approaches for educators to obtain student buy-in and engagement with either of these methods (that contrast with student expectations and experience of lecture-only course delivery). Also, problems experienced by students with these teaching methods are addressed only in a cursory manner in the literature. The presenter has published a paper describing this workshop (Balan, Clark and Restall, 2015). It presents a structured framework for starting a pre-learning class. The framework is anchored in good educational theory and practice, and provides an approach that addresses documented difficulties and problems experienced by students.
Designing Coursework for Decision Makers

Susan D’Aloia
Client Success Advocate, Blackboard

Goal for Participants: Participants will synthesize how current in class lecture topics can be remediated into online activities using Blackboard’s tools. Teacher centric and Learner centric principles will be explored so to empower decision-making.

We will use the Hybrid-Learning Toolkit, which asks participants to identify with up to eight learning events as they align with specific teaching and learning verbs. Conventional and more in depth practices of flipped learning will be explored.

Participants must bring in specific learning objectives from their courses and have access or first hand knowledge of current course materials.

Dr. Susan D’Aloia is an interdisciplinary educator and program developer who has worked as a consultant and trainer in the United States, Latin America and Asia. She has worked with public and private schools, non-traditional learning institutions and multiple colleges and universities. Susan has taught over 1,000 hours of fully online and blended learning instruction as well as serving as a Department Head and an Associate Director. She maintains a passion for digital remediation of content and processes, and working with the educators who continue to maintain and innovate learning.
Developing the Capacity of Critical Thinking in Learning

Ed Tew
The University of Winchester, United Kingdom

Intended Audience: Faculty who teach in various disciplines and would like to share their experience in promoting critical thinking in the classroom.

Overview:

Critical thinking is a key competency and relevant to all level of learning. It can be used in a wide range of situations, context and in everyday life. The capacity to recognize an argument, evaluate and analyse a critique of arguments in order to formulate your own stance is essential skill that all students require.

Objectives:

1. To explore and understand critical thinking
2. To explore a list of approaches to encourage students to think critically
3. To establish research collaboration among the participants

Ed Tew Ph.D., MA, ACMA, GCM, FHEA is a Senior Lecturer in the Department of Accounting, Economics and Finance at Winchester Business School. Ed’s specialist interests include management accounting and accounting education. Ed is also interested in qualitative research methodology.
D5

Are We Ready for 21st Century Learning?

James Hamilton
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Navitas
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Current models of higher education are being challenged by a massive increased demand for a skilled global workforce, generational shifts in behaviour and influence and increased funding challenges. At the same time, teachers and learners are demanding better experiences from their institutions. These demands are for rich, personalised and social learning that use technology to create new kinds of delivery models that engage the student beyond the traditional classroom and into the workplace. It is clear that what has worked in the past will not work in the future.

How well prepared are our learning technologies to respond to these challenges? And how prepared are our teachers and students?

This workshop will provide an opportunity to consider how ready we are for 21st century learning by considering the dimensions of the Next Generation Digital Learning Environment proposed by EDUCAUSE (Brown, 2015). We will use interactive online tools to develop an understanding of our current state and the steps that we need to take to prepare ourselves for rapidly changing education environment perched on the edge of a massive technology shift.

Participants should bring a smartphone or laptop that has an internet connection.

James Hamilton
James is the Head of Learning Technologies and Systems for Navitas, a leading global education provider that delivers an extensive range of educational services to over 80,000 students through more than 120 institutions in 31 countries. In this role he is responsible for leading the development and implementation of a global vision for learning technologies across the whole organisation to position Navitas as a leader in technology-enhanced learning.

James is an accomplished learning technologies leader. His background as an educator and a technologist gives him insight into the importance of agile and design thinking approaches to the design of sustainable and compelling digital learning experiences for students. His particular interest is in the use technologies that implement and support open standards and architectures to foster interoperability and integration between tools that support data-driven and personalised learning.

Prior to joining Navitas James led learning technologies at a major metropolitan university and was responsible for the design, implementation and operation of one of the largest elearning ecosystems in Australia.
Every Child a Scientist: Student-Centred Approaches to Active Learning in Science

Emily Perry
Sheffield Hallam University, United Kingdom

Workshop objectives: (limit to 24 pax)
- To explore the benefits of enabling students to act as scientists in their learning
- To illustrate successful projects and teaching strategies which support students to act as scientists
- To share and collaboratively develop further ideas for authentic student research

Workshop description:
In the Centre for Science Education at Sheffield Hallam University, we lead national and international projects which enable students to learn science through active, student-centred, inquiry-based approaches to learning. We work with teachers and scientists to develop these approaches, so that they are authentic, contextually appropriate and successful in developing students’ skills and understanding. In this workshop we will explore the benefits of enabling students to act as scientists at all stages of their learning in science. We will illustrate these benefits by drawing on our own experiences of developing active approaches to learning science, and discuss some of the challenges which can be faced in this style of learning. Participants will share their own experiences and ideas about student-centred and inquiry-led learning in science, and we will work together to develop further ideas for authentic student research projects.

Workshop presenters:
The presenters of this workshop are drawn from the Centre for Science Education, part of the Sheffield Institute of Education at Sheffield Hallam University. The Centre for Science Education was established more than thirty years ago and has an international reputation in the field of STEM education. Our aim is to improve outcomes of all learners through improved access to and engagement with science and STEM-related careers. We lead national and international STEM education programmes, focusing on curriculum and pedagogical design and development, the professional learning of STEM teachers, public and employer engagement in STEM, widening participation to traditionally under-represented groups, and research in science education. Our staff engages with teachers throughout their careers from initial teacher education to postgraduate study and research. In our international work, we have a particular focus on South-East Asia and also work with numerous partners in the EU, alongside work in West Africa and the Middle East.

The team is led by Dr Emily Perry, head of funded knowledge exchange for the Sheffield Institute of Education. Emily's interests lie in active learning through practical work and enquiry, teacher professional learning and in developing innovative ways of teaching chemistry. Her qualifications include an MA in Education and a PhD in chemistry. She was a chemistry teacher for ten years, working in the UK, Brazil and Hong Kong, and is a Fellow of the Royal Society of Chemistry.
Infusion of Thinking Skills With Problem-Based Learning Approach Into Graphic Design Teaching Instruction At UTAR

Su Cheong Wong
Department of Multimedia Design & Animation, Faculty of Creative Industries, University Tunku Abdul Rahman, Malaysia.
(E-mail: scwong@utar.edu.my)

Abstract

Theoretical and practical learning are integral components in the pedagogy of graphic design in higher education. These two components emphasise on practical teaching as the main delivery methods or techniques and are used by most Malaysian higher educational institutes in imparting knowledge to learners in the field. However, one critical aspect in teaching graphic design is conspicuously missing to meet present demands, namely critical and creative thinking. There is therefore a lack of integration of thinking skills across the subject matters. Creative thinking should be integrated into the project work of practical modules so that learners are encouraged to think out of the box. Most Malaysian higher educational institutions, however, gave short shrift to thinking skills and hardly incorporate thinking skills in the theoretical and practical teaching of graphic design. Critical & creative thinking are often taught as a separate subject if at all. The separation of critical thinking skills and graphic design skills has ramifications that extend beyond the classroom in knowledge and skills acquisition. As a result, the curriculum does not prepare the learners to meet the demand of real-world practice in the workplace. Redress the deficiency, this research therefore recommends that institutions of higher learning should endeavour to make creative thinking a top priority for inclusion in the curriculum of graphic design studies. It is imperative to implement a better and practical pedagogy that infuses critical & creative thinking into the curricula programme to produce outcomes that are in line with industry and professional demands. This action research in which uses a constructive research approach to develop a new integrated creative activity instruction (ICAI), which infuses thinking skill to improve graphic design learning. The philosophical framework for the infusion of critical thinking skills is mainly derived from John Dewey’s Theory of Progressivism (1954), James Jerome Gibson’s Affordance Theory of Gibson (1986) and Robert Marzano’s New Taxonomy (2000). The research activity is divided into four stages spanning four academic years: developing a new model, confirmation of ICAI possibility and testing the new model.

Keywords: Graphic Design, Infusion of Thinking Skills

Introduction

Graphic design training involves a wide range of practical and problem solving activities. It also includes a series of complex thinking processes in searching for the best solution for a given task. “Design is an active practice engaging the body - hands, arms, shoulders - in acts of both precision and gesture to manipulate circumstance and environment” (The New Relevance of Basel Basics, pg. 2). The process of creating, and endlessly refining an object fosters the motion and actualisation of the potentiality presupposes, and implies and entails conceptualisation which itself is a form of creative and therefore critical thinking. As such, critical thinking facilitates creative application of design knowledge and skills. In the workplace, this “soft” or “generic” skill enables a person to tackle complex issues and perform trouble-shooting in response to familiar and unfamiliar problems – a trait which is highly sought after by an employer. Not least, creative thinking can also generate new ideas and knowledge which can be translated into innovative products and services. Malaysia is no exception and increasingly employers have listed as one of their expectations in job seekers or potential employees the ability and capacity to analyse and solve problems. Unfortunately, at the present level, the curricula for creative design studies have yet to fulfil the expectations and demands of the industry. The main objective of this paper is to propose an integrated instructional framework with thinking skills infused in graphic design instruction.
Critical and creative thinking skills can help graphic design students in improving individual competency, solving critical problems and making decisions. A survey was conducted between the months of February to July in 2015 by UTAR Centre for Immersive Technology & Creativity (CITC) research group on 21 leading private institutions in Malaysia. The survey involved 200 participants from leading private institutions offering graphic design programs – and comprising students, academic managers, lecturers and industry practitioners. The purpose is to analyse graphic design programs’ curriculum structure and collecting stakeholders’ opinions about the importance of thinking skills in graphic design curricula, and the possibilities of thinking skill infusion as a teaching instruction. Seventy-six percent of graphic design stakeholders agreed that thinking skill is not well taught in classroom and not fully given the focus and attention among Malaysian design institutions. The result shows 88% of the institutions are teaching thinking skills and graphic design as two separate or discreet subjects. Furthermore, thinking skill subject usually taught by instructors who do not has any creative design background. As a result of this practical mismatch, students faced difficulties in integrating thinking skills into their graphic design coursework. According to a 2015 survey report (see Appendix 1), most of the institutions teach thinking skills as a separate subject. Only six out of twenty one institutions that offer creative design programs actually also offer creative thinking skill as a subject; and only two out of twenty one institutions are offering critical & creative thinking as a separate subject in graphic design program. The report also stated that only ten percent of CCTS subjects has been taught by lecturers with graphic design background. Thus, the majority of lecturers may not have the skills to bridge the connections between CCTS and graphic design. These lecturers may not be able to impart knowledge which will be useful to graphic design learners. Graphic designers need thinking skills so that they can categorize, analyze and evaluate the right data for specific projects. Educators and learners should be regarded as ideal stakeholders in the teaching and learning (T&L) cycle. The quality of T&L experience relies very much on the mutual interaction between lecturer and learners. The locus of the learning experience in this event could be described as ‘inside’ and ‘outside’ component of learners’ mind set. Sadly, the lack of CCTS as part of their skill sets have led to many of the learners producing far from satisfactory work. The following are some of the observation summaries by program stakeholders made on graphic design learners:

1. Lack of depth in originality and imagination;
2. Stereotype of thinking and poor reflective skills;
3. Poor time management in process of conceptualisation, reflection and analysis;
4. Not being able to recognize and appreciate the critical importance of the design process. Prefer to jump straight into the final conclusion in design without completion of creative design thinking; and
5. Learn individual subject separately, and not able to connect all the skills and knowledge learned to apply in creative course works.

**Objectives of the Study**

1. To develop and propose an instructional model for infusing thinking skills into project-based graphic design.
2. To test the effectiveness of the proposed instructional model in applying creative thinking into project-based graphic design coursework for
   a. Low achievement group
   b. Average achievement group
   c. High achievement group
3. To test the effectiveness of the proposed instructional model in applying critical thinking into project-based graphic design coursework for
   a. Low achievement group
   b. Average achievement group
   c. High achievement group
4. To find out the perceptions of the learners towards the new model of instruction as compared to the conventional model

**Research Methodology**

This is a constructive research design and the main purpose of this research is to develop a new teaching instruction for graphic design learning at undergraduate level. The independent variables are TM and ICAI whereas dependent variables are graphic design students’ academic performance and creativity (see Appendix 3).
The research design is to experiment the efficacy of ICAI towards graphic design student in academic performance and creativity. The research also intends to investigate ICAI effectiveness towards three different ability groups in graphic design. They are high, average and low ability groups. This constructive research method will start with problem definition as stage one activity. Then it is followed by framework construction as stage 2 activities and framework confirmation as stage 3 activities. The fourth stage is designed to test the efficacy of ICAI in creativity and academic performance. All the research experiments in three stages will take two long semesters, which is equivalent to 8 months.

**Results**

**H1:** ICAI experiment has shown positive improvement in academic achievement by helping experiment group to perform better in Graphic Design learning.

**H2:** ICAI experiment has shown positive improvement in academic achievement by helping average ability and low ability group to perform better in Graphic Design learning.

**H3:** ICAI is expandable and able to be implemented in Project Based Learning modules of Graphic Design

**H4:** ICAI is flexible and effective, and able to be adopted by lecturers and students in the teaching and learning of Graphic Design

**H5:** ICAI is an effective teaching instruction that can help average and low ability students to do better in Graphic Design learning.

**H6:** Students exposed to the new ICAI instruction for Graphic Design learning will show significant improvement in academic performance compared with traditional instruction.

**H7:** Students exposed to ICAI for Graphic Design learning will show significant improvement in creativity compared with traditional instruction.

**H8:** Average and low ability students who are exposed to ICAI for Graphic Design learning will have more positive stimulation in Graphic Design learning compared with traditional instruction.

**H9:** High ability students who scored 30.8 % higher score in TTCT post-test after a semester; Average ability students who scored 13.75 % higher score in TTCT post-test after a semester and Low ability students who scored 15.74 % higher score in TTCT post-test after a semester. High academic achievers are not parallel to creativity value in TTCT test, refer to student 2 in the chart; whereas low academic achiever like student 10 also possible to demonstrate good creativity values.

**Significant of the study**

ICAI model is a structured instructional model in which is flexible to apply in most of the Graphic Design curriculum. ICAI model is user-friendly and can be adopted and implemented easily in Graphic Design T&L framework. ICAI model also makes provisions whereby instructors can change and modify Guided Practical Modules and Activity Design from semester to semester, depending on the learners’ profiles, population and individual abilities. It is hoped that new proposed instructional model would be used in other levels of creative learning, such as secondary schools and Postgraduate studies.

**Conclusion**

New proposed instructional model has the potential of creating a methodology that will benefit the stakeholders such as Graphic Design learners, educators, academic managers as well as industry practitioners in enhancing creative thinking and problem-solving processes.
Appendixes

Figure 1: Thinking Skill Infusion

![Diagram of Approaches to Teaching Thinking]

TEACHING OF THINKING
Direct instruction in thinking in noncircular contexts

TEACHING FOR THINKING
Use of methods which promote thinking in circular contexts

INFUSION
Restructuring content lessons for direct instruction in thinking

INFUSION integrates direct instruction in specific thinking skills into content area lessons. Lessons improve student thinking and enhance content learning.

Figure 2: Conceptual Framework

![Diagram of Proposed Conceptual Framework]

PROPOSED CONCEPTUAL FRAMEWORK

Controlled Variables
- High Ability
- Average Ability
- Low Ability

Independent Variables
- Traditional Method (TM)
- New Proposed Instructional Model

Dependent Variables
- Performance
- Learner's Satisfaction
- Creativity

Observation for Pre-Experiment (14 weeks)
Evaluation for Post-Experiment (14 weeks)

Figure 3: Research Design

![Diagram of Proposed Research Design]

PROPOSED RESEARCH DESIGN

4 Months
- Define The Problem
- Interview With Graphic Design Program Stake Holders To Identify Weaknesses Of Traditional Method
- Conduct Malaysian Graphic Design Institutional Analysis On Curriculum

4 Months
- ICAT Framework Construction
- Teaching CCD2 & CCD3 Units With ICAT Implementation on first experiment group
- Invented 14-Week Guided Practical Module

8 Months
- Confirmation Of ICAT Possibilities
- Teaching CCD3 With Improved ICAT Model On Second Experiment Group
- PILOT Test By Testing ICAT Efficacy In Teaching Graphic Design

8 Months
- Experiment On Teaching Web Development & Digital Imaging Units With Improved ICAT Model
- Conduct Questionnaires, Participants Interview & Semester-END Evaluation On 3 Experiment Groups

4 Months
- QUAST Experiment To Collect Data
- TICT Test To Third Experiment Group On CCD3 Unit
- Pre & Post Test Interview To Experiment Group
- Conduct Semester-End Evaluation On Experiment Group
- TQT Test ICAT Efficacy To High, Average & Low Ability Groups in Performance And Creativity

Research Report
- Research & Observation Writing

ICAT: Integrated Creative Activity Instruction
CCD2: Creative Communication Design2 LUMD 2154
CCD3: Creative Communication Design3 LUMD 2164
Digital Imaging: LUMD 2154 Conducted By Lee Lih Siew LUMD 2083
Web Media & Development 2 Conducted By Mohd Faisriz Ali LUMD 2064
Figure 4: Affordance Theory

A Sociocultural Model for an Affordance Theory of Creativity

Figure 5: ICAI

INTEGRATED CREATIVE ACTIVITY INSTRUCTION (ICAI)

<table>
<thead>
<tr>
<th>Instruction</th>
<th>Response</th>
<th>Action</th>
<th>Marzano’s New Taxonomy</th>
</tr>
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<tr>
<td>Induction</td>
<td>Self Reflection</td>
<td>Self Analysis Through Past Experience</td>
<td>Self System</td>
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<td>Briefing</td>
<td>Choosing A Problem</td>
<td>Problem Analysis</td>
<td>Self &amp; Metacognitive</td>
</tr>
<tr>
<td>Task</td>
<td>Envisage A Destination</td>
<td>Identify Opportunities</td>
<td>Self &amp; Metacognitive</td>
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<td>Group Interactions</td>
<td>Predict Possibilities</td>
<td>Metacognitive &amp; Cognitive</td>
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<td>Identify Best Solutions</td>
<td>Developing Big Ideas</td>
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<td>Solution Defined</td>
<td>Making Final Decision</td>
<td>Proto-type Final Solution</td>
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<tr>
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<td>Promote &amp; Convince</td>
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<td>Feedback</td>
<td>Evaluation Of Solution</td>
<td>Verification</td>
<td>Self &amp; Metacognitive</td>
</tr>
</tbody>
</table>

Figure 6: ICAI Infusion Strategy

INFUSION STRATEGY FOR INTEGRATED CREATIVE ACTIVITY INSTRUCTION (ICAI)

To Explain

DESIGN THINKING ANALYSIS
PACEMARKED BY REAL WORLD CHALLENGE

To Explore

CONCEPTUAL BRAINSTORMING
BY SMALL GROUP INTERACTIVE
REFLECTIVE EXPLORATION

To Envisage

LEARNING-BY-INTERACTION THINKING-DOING
PROBLEM-BASED LEARNING ACTIVITY

DESIGN THINKING PRACTICE
FACTORY BY IDEA DEVELOPMENT PROCESS

To Evaluate

AUTHENTIC PROBLEM & OPPORTUNITY PROJECT BRIEF

REFLECTON TO PROBLEM KNOWLEDGE & EXPERIENCE COURSE INDUCTION

RELATIONSHIP BETWEEN
DECISION-MAKING & REFERENCE

PROPOSAL & PRESENTATION DESIGN EVALEUATION

DECLARATION & EXECUTION
OF IDEA DEVELOPMENT PROCESS

To Engage
References


Are We Doing it For Malaysians: A Fundamental Study on Generation Cohorts and Education System Design

Hiram Ting¹, Sharon Tan @ Rebecca² and Ernest Cyril de Run ³

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Abstract

The landscape of higher education has experienced an increasingly diverse community of learners clustered in cohorts. Historically Malaysia has conveniently adopted the cohort labels from the U.S. for segmentation and management purposes. Unfortunately, such adoption is all but without theoretical basis. As such the stereotypes of generations should be considered carefully before creating a new learning environment. It is therefore important to explore the actual generation cohorts in Malaysia so that the educators could develop an appropriate education system design to fit the needs of Malaysians today and generations to come.

Keywords: Generational Cohorts, Learning environment, Malaysia

Introduction

Marketers for many years have a propensity to use both demographic and psychographic variables to classify and segment markets (Kotler & Armstrong, 2011; Scardino, 2004). Despite the complexity of the market, generational cohort marketing is emerging as superior segmentation approach (Meredith & Schewe, 2002).

What’s Generation Cohort?

Generation cohort defines consumer segment using coming-of-age year as a proxy determinant (Rogler, 2002). The emphasis is not on their age and life-stage, but on their personal attachment to life experiences of major societal events during formative years (Noble & Schewe, 2003). Major development and changes in a country’s institutions are believed to have affected individuals profoundly, especially those who are in their formative years (Fong, 2004). Such impact gives rise and forms new generation cohorts.

Research Problem

Past studies in Malaysia have conveniently adopted the cohort labels from the U.S. literature to segment the markets (Eze, Tan, & Yeo, 2012; Lim, Yap, & Lee, 2011; Munasamy, Arumugam, & Rahim, 2010). Unfortunately, such adoption is all but without theoretical basis (de Run & Ting, 2013). Since the events of the U.S. and Malaysia cannot be wholly the same, categorizing the Malaysian cohorts by merely using age variable or birth years of the former does not reveal the actual generational orientations and characteristics. Such generalization results in the adaptation of the former’s education system, which to certain extend, might deemed not effective.

Objectives of the Study

The present study is one of the study investigate the generation cohorts in Malaysia which is surprisingly overlooked and its effect on education system design. This study will tells if the difference of generation cohorts would require different education system design.
Research Methodology

A qualitative approach via personal interview was administered nationwide. 80 interviews were conducted and audio-recorded. The data were then transcribed and analyzed using content analysis with the aid of ATLAS.ti.

Results /Discussions

Since generation cohorts in Malaysia are basically unknown, age was used as a proxy to find out whether the major events which they overtly remembered were indeed something which happened during their formative years.

Contributions of the study

The present reveals major external events occurring in Malaysia which was found impactful that subsequently lead to the formation of its generation. A meta analysis comparing Malaysia with the west suggests that the adoption of cohort labels and characteristics from the U.S. sources, assuming that the age-ranges are applicable to Malaysian population, is categorically unfounded. In the similar vein, certain aspects of the education system design which are profoundly adapted and implemented in Malaysia are now being regard as inappropriate. An education system design that best suits Malaysia’s own generation cohort should now be developed and prioritized.

Conclusions

With a firm belief that the existence of the actual generation cohorts in the Malaysian context and these cohorts are different from other countries, this study serves as a precursor to undertake future research on the implication of generation on education system design. It is believed that such endeavor would achieve greater learning output in the contemporary setting and many more years to come.

Figures/Display Elements

<table>
<thead>
<tr>
<th>Cohort Label</th>
<th>Birth Years</th>
<th>Defining Events (formative years)</th>
<th>Brief Description of Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second World War cohort</td>
<td>1922-27</td>
<td>World War II</td>
<td>Working for common; team oriented and more patriotic.</td>
</tr>
<tr>
<td>Post-war cohort</td>
<td>1928-45</td>
<td>After World War II</td>
<td>Experiencing remarkable economic growth and social tranquility, a time of family togetherness; seeking for a sense of security and stability.</td>
</tr>
<tr>
<td>Leading-edge Baby Boomer</td>
<td>1946-54</td>
<td>Assassination of JFK, Martin Luther King Jr, Vietnam War</td>
<td>Witnessing first man on moon; championing the civil and women's rights causes; hedonistic and self-indulgent.</td>
</tr>
<tr>
<td>Trailing-edge Baby Boomer</td>
<td>1955-65</td>
<td>Economic downturn since the Depression</td>
<td>Witnessing US defeat in Vietnam, Watergate Nixon's resignation, the oil embargo, and raging inflation; less optimistic about financial future.</td>
</tr>
<tr>
<td>Gen X</td>
<td>1965-76</td>
<td>A time of economic and social instability and uncertainty</td>
<td>Maturing an era of soaring divorce, cultural diversity, and value quality of personal life than work life; individualists; showing entrepreneurship spirit; preferring a lifestyle that provides freedom and flexibility.</td>
</tr>
<tr>
<td>N Gen, Gen Y, Millennium</td>
<td>1977-94</td>
<td>The ‘Information Revolution’</td>
<td>Growing up in the advent of the internet; more idealistic and social-cause oriented; pragmatic, elusive due to media-saturated environment</td>
</tr>
</tbody>
</table>

Figure 1. Generational cohort in U.S (AMERICAN) (Schindler & Holbrook, 1993)
Figure 2. Generational cohort in Malaysia (ASEAN)

References


P3

Service Mindset in Teaching – Adaptation of Ron Kaufman’s Six Levels of Service Mindset in Teaching

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Abstract

Private education institutions need unique pull factors to be outstanding in the industry. Product and delivery of an education institution can be duplicated but service mindset cannot be copied. The society at large could judge whether the teaching process of an education institution was effective through the knowledge and soft skills demonstrated by its students. Hence, the mindset of teachers is crucial in determining the quality of students’ learning process. Ron Kaufman (2012) defines service as “taking action to create value for someone else”. Teachers create value for students who in turn create value for the whole society, teaching is therefore a service and by adapting this marketing concept and applying it to teaching, it is hoped that there is a common service language and teachers will have a benchmark for improvement. This idea was well-received when it was first introduced through a workshop to a group of ten teachers at Sunway College Johor Bahru. The six levels of service mindset are categorised as Criminal, Basic, Expected, Desired, Surprising and Unbelievable (Kaufman 2012). Suggestions of how service mindset can be adapted in teaching will be illustrated during the poster presentation.

Keywords: Common Service Language; Education Teaching; Service Mindset; Ron Kaufman

Introduction

To last long in a business, an organisation must have unique product, delivery and service mindset. Product and delivery can be duplicated by others but service mindset cannot be copied. It is the unique service mindset of the individual in the organisation that differentiates the firm from others and this is what attracts customers to come back, to stay loyal and to recommend to others.

Research Problem

In the industry of private education, teachers are at the forefront of the industry where they interact with students almost on a daily basis. Although students are the users of education, they are not the consumers of the education provider, per se, because the parents are the paying party and the society is ultimately the beneficiaries of the trained students (Schwartzman 1995). However, students are the ones who have the first-hand experience of the teaching process of an institution and others could judge whether the teaching process was effective through their knowledge and soft skills demonstrated. “Teachers should judge their success by the success of their students” (Wilkinson 2015). Students will be the mouthpiece – they are the ones who will tell others about their perception of an institution and teachers are the biggest provider of their experience and impact. The service mindset of teachers seems to be one of the major pull factors for an education institution to be outstanding, for “people buy from people, not from companies” (Cassara 2004).

Objectives of the Study

The objective of this poster is to bring awareness to teachers of the different levels of service mindset so that there is a benchmark for achievement and improvement. This study is slightly different from Kaufman’s idea of ‘training should not start with customer-facing employee, but should start with mission- support staff’ (as cited in Kamensky 2016). Since teachers are facing the students every day, teachers are similar to the ‘customer-
facing employee’, therefore training should start with the teachers. However, students cannot be equated to customers as in the typical business context, because teachers are not to please students and think that customers are always right. This concept will also create a “common service language” for the service rendered (Merisalo 2015). It is emphasised here that teachers are not to ‘please’ the students to gain their favour because what the students like and prefer may not be good for them in the long run (Carpenter 2000). For example, students do not like homework but homework is a necessary training for them to acquire the desired skill.

Research Methodology

This poster presentation is an extension of ideas gathered from texts produced by Ron Kaufman. The authors conducted a literature review of several journals to understand the roles of teachers and students in the education industry. With the years of observations on the learning behaviour of students, the idea was incorporated and preliminary workshop conducted among a small group of teachers and feedback solicited.

Results /Discussions

The six levels of service mindset is based on Ron Kaufman’s idea of promoting a common service language and his definition of service is “taking action to create value for someone else” (Kaufman 2012).

The six levels are listed below:

- **Criminal** service is really bad service which violates even minimum expectations. This is the type of service that your customers will remember never to use again and will be sufficiently angry to contact you and complain about it (Kaufman 2012).

- **Basic** service is disappointing and it is the point whereby customer’s frustration can turn into anger. But, when the service is over the customer may not be disappointed enough to complain. However, they may tell their friends and may remember not to patronize you for that type of service again (Kaufman 2012).

- **Expected** service is nothing special whereby the service is only average or the norm. The customer might patronize you, but only if there are no better options available (Kaufman 2012).

- **Desired** service is what your customers hope for and prefer. They may continue to do business with your organisation again because you do things for them just the way they like it (Kaufman 2012).

- **Surprising** service is something special, like an unexpected gift. This happens when your organisation gives your customers more than they expected which encourages customers to enjoy your service and ultimately they may become repeat customers to your organisation (Kaufman 2012).

- **Unbelievable** service is an astonishingly fantastic level of service that your customers are unable to forget. The customers may not be able to forget the legendary treatment or service that they have received and they may tell their friends about it (Kaufman 2012).

Contributions of the study

**Criminal** service: This may occur when the teacher does not cover the required syllabus to prepare the students for assessments or examinations. The teacher may be liked by the students because of his/her personality but there is insufficient teaching of syllabus content. Teachers who always show negative emotion that students dread attending their class is also classified under this level.

**Basic** service: This may occur when the teacher only covers the syllabus by reading from the PowerPoint or slides with minimum elaboration or examples provided. Teachers who is indifferent to students and do not care about whether learning took place.

**Expected** service: It is usually expected that the teacher must cover the syllabus by providing sufficient elaboration or examples to prepare the students for their assessments or examinations. Teachers care about whether the students are learning.
Desired service: It is desirable when the teacher covers the syllabus in an interesting manner by providing sufficient elaboration or examples with some elements of humour and sharing of knowledge or experiences beyond the textbook. Teachers change the delivery method to help students in learning. Teachers design ways to cause the students to learn (Wilkinson 2015).

Surprising service: This may occur when the teacher covers the syllabus in an interesting manner and surprises the students by conducting educational trips or inviting speakers to conduct talks or seminars for students. Students walk out of a class leaving a better person than before they enter the class (Wilkinson 2015).

Unbelievable service: This may occur when the teacher provides a personal touch by caring and showing concern for the students’ welfare or even using unconventional teaching methods to educate the students about the syllabus. An example of an unbelievable service in the education industry is the unconventional teaching method adopted by a Mexican science teacher who dresses up as Spiderman to capture his students’ attention in National Autonomous University of Mexico (Garrido 2016).

Conclusions

In conclusion, Ron Kaufman’s Six Levels of Service Mindset is very useful in the service industry especially in the education industry. Therefore, it is very important that the education industry attempts to adopt and adapt these six levels of service mindset to continuously improve the service level in colleges and universities.

Figures/Display Elements

Figure 1. The Six Levels of Service Mindset

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The Student’s Perceptions Of Korean Popular Music / Songs (K-Pop) On Learning Korean Language

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Introduction
As the Korean popular culture transcends borders and its influences permeate into the Malaysian community, Korean-pop has gained recognition and garnered tremendous popularity among Malaysian teenagers. Students are very fond of K-pop music with its catchy rhythms, songs and synchronized movements. Korean Language has become a popular language to learn among students. This study explored the university college students’ perceptions of listening to K-pop songs in learning and acquisition of Korean Language.

Research Questions
• What are the Korean language students’ perceptions of listening to K-pop music/songs and learning the Korean language?
• Is there a significant difference between hours of listening to K-pop music/songs and students’ perceptions of learning the Korean language?
• What are the Korean language students’ perceptions of listening to K-pop music/songs and the acquisition of the Korean language skills?

What is K-pop?
Korean pop music is called K-pop which is a musical genre that incorporates a variety of styles, including pop, hip-hop, mp, rock, R&B, electronic music and its most important identifiable attribute is that its origin is from South Korea. (Leung, 2012)

Results
• The findings reported that students’ responses were generally positive and favourable, where listening to K-pop songs encouraged students to learn the Korean language.
• There was a significant difference between the number of hours listening to K-pop music and the student’s perceptions of listening to K-pop music to learn the Korean language.
• The students perceived that they actually were able to enhance their language acquisition (speaking, listening, writing, reading, pronunciation, vocabulary acquisition) through listening to K-pop songs.

Methodology
• This study employed a survey research design using a 5 point Likert-scale in the questionnaire to measure the students’ perceptions.
• Descriptive analysis was used to describe the participants’ responses on their perceptions towards K-pop songs and learning of Korean language and language acquisition. An Analysis of Variance was carried out to explore if there is any significant difference between the number of hours of listening to music and language acquisition.

Conclusions
• Listening to K-pop songs played a significant role in motivating and encouraging students to learn the Korean language.
• This study provided important information on how music can be used as an effective tool in supporting students to learn a foreign language by improving their skills in reading, speaking, listening, writing, pronunciation, vocabulary acquisition and understanding.
• Students who listened repeatedly to a song will increase their retention of words. This is consistent with the findings by Salcado (2010) which showed that students performed better in lessons which used songs and where they were able to replay the songs repeatedly.

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References
**POLITICAL PARTICIPATIONS AMONG YOUTH: THE ANALYSIS OF PROTESTS IN UNIVERSITY UKM 2014-2016**

**INTRODUCTION**
- Being of dominant impact and influence, youths play an important role in society-able to overthrow the regime (Altbach, 1989).
- Patterns and trends of political participation of young people have proven that their participation comes with specific objectives.
- There are factors that contribute to their participation.
- Aspects of their participation with the new political culture (protests) especially among university students might be considered as the new political landscape in Malaysia for the sake of democratization.
- Understanding the scenario in politics - political culture in the contemporary era.

**METHODOLOGY**
- Descriptive analysis – to study human behavior by using observation, written report and interview (Taylor and Bogdan, 1984).
- Grounded theory is an inductive methodology (Astrid Gymnild, 2015).
- Unstructured interviewing between the researcher and informants (10 informants that were able to give information: activists, scholars, politicians, student representatives) - useful for exploring a topic broadly (Saldana, 2009: 46).
- Structured questionnaire based on Chua (2011) – 60 undergraduate students in UKM from various courses (age: 18-20 years old)
- Analysis of the data from respondents - using SPSS.

**EXPECTED FINDINGS**
- There are more significant factors that contribute to the students’ protest.
- There is a relationship between campus politics and political protest.
- There is a significant relationship between protests and political radicalism.
- There is a pattern of political participation among students at the university level.

**IMPLICATIONS**
- To provide the government a more objective basis for the understanding of why Malaysian students (public university) get involved in protests.
- To pinpoint the implications of organized student actions for the Malaysian society.

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Minority Christians’ Perspective Towards Religious Issues

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Introduction
Malaysia is a multi-ethnic and multi-religious country. Malaysia being a country where more than 60% of religious groups coexist, the absence of inter-religious groups is the norm. While religious pluralism presents a real challenge to inter-faith relations in Malaysia, there is an increasing awareness among religious leaders that there is a growing acceptance of the presence of other religions.

Objectives
- Identify the roles of religious intolerance as experienced by the minority Christians.
- To determine the factors that contribute to religious intolerance.
- To propose measures that contribute to religious tolerance.

Results
- Restrictions in the Freedom of Religions
  -限制 the freedom of religious beliefs, the BM translated Bible, etc.
  -Ban on the use of the term “Allah” as well as other 36 Muslim words and phrases for Christians.
  -Synthetic-Ethnic (Rogat, 2008)
    -“Christian” identity has been linked to religion, impact on Christianization: religions symbols became a contradiction of religious activities.
  -Stigmatization and negative stereotyping

Material and methods
- Participation - Sethiah Ling and Salleh}
- Participants Group - Christian Religious Organizations
- Interviews (ECC, ECM and Roman Catholic) and MCC/CSR
- Qualitative research
- Data collection - document sources, interview, photo analysis, special analysis

Conclusion
- The minority Christians’ perspective towards religious issues is shaped by various factors, including historical and cultural influences. These factors may lead to increased religious intolerance and discrimination.
- Religious pluralism must be fostered through inclusive policies and practices that promote inter-faith dialogue and understanding.
- Education and awareness programs are necessary to combat religious biases and promote tolerance and respect for diversity.

Literature cited
Holistic Education in Taiwan–The Story of Chung Yuan Christian University

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Abstract

Chung Yuan Christian University had been one of the best private universities in Taiwan. However, many people are puzzled that a Christian university can survive and become so distinguished in a world of secularization. This essay will explore the administration, faculty, course-design and its campus culture through an examination of the ideals and practice of holistic education. A case study like this will not only help us better understand the secret of the successful university in Taiwan, but also will explore the possibility of application to other high education institutes in Taiwan and other parts of the world.

Keywords: Holistic Education; Taiwan; Chung Yuan Christian University; General Education

Introduction

Chung Yuan Christian University (hereafter CYCU) has been considered one of the best private universities in Taiwan. The success of the CYCU has been demonstrated by some important distinctions that CYCU has proudly achieved. For example,

* CYCU was awarded the largest funding available to private universities from the Ministry of Education for the past four years (2013-2016).
* CYCU has received the largest funding granted from the Ministry of Education through its “Teaching Excellence Project” for the past two years (2014-2016).
* CYCU ranked first among all of Taiwan’s private universities for the past four years. (2011-2015) (by Shanghai Jiao Tong Univ., by Center for World Universities Ranking, and also by Times Higher Education BRICS & Emerging Economies Rankings)
* CYCU ranked first among all of Taiwan’s private comprehensive universities when it comes to alumni earnings as determined by 104 Job Bank in 2016. (In other words, the graduates of CYCU have been very competitive in job market.)
* CYCU has been awarded “The most friendly campus” among the universities evaluated by the Ministry of Education in the year of 2009 &2014.

In other words, when it comes to evaluating its faculty, graduates, and campus, CYCU remains distinguished in Taiwan. Then, “how could a Christian University become so distinguished” has constituted a very intriguing question.

Research Problem

Taiwan has never been a Christian country and Christian population had been a small minority in the history of Taiwan. Furthermore, many universities have dropped their educational ideals in front of secularization of modern times. Yet CYCU turns out to be a success story in higher education. Why and how CYCU has become a distinguished remains a secret to many people in academic field as well as church circles.

Objectives of the Study

This essay, based primarily on the various sources on CYCU (including the founder’s diaries, faculty’s observations and reports, the biography of co-founder Rev. James Graham, as well as academic works on
Christian education in China and Taiwan), attempts to give a general overview of the holistic education of CYCU, we will not only be able to better understand the university, but we can also reevaluate strategies and directions of holistic education for future higher education in Taiwan as well as in other parts of the world.

Research Methodology

It would be problematic to adopt current educational theories or Christian practices when analyzing the holistic education of CYCU. There are three reasons that this paper avoids using traditional methodology of education. First, up to the present time, there has not been an ideal theory of education that can be used to illustrate the major characteristics of a Christian university. Second, although holistic education is a popular term in Taiwan, no consensus has been reached to define this term. In other words, each university might have different contents while claiming its adoption of holistic education. Furthermore, CYCU was the first and the only successful case in holistic education among 10 Christian universities in Taiwan.

The presentation of the holistic education of CYCU will be mainly through a cross-examination of two basic constructions of the university—its hardware and software. The hardware includes administration, leadership, composition of the faculty, and its mission statement and educational philosophy. The software encompasses the ideals and practice of holistic education, which is carried out by the Center of General Education.

Results/Discussions

The discussion on the hardware of CYCU is an examination of its administration, leadership, team spirit of the faculty, and the contemplation and realization of its mission statement and educational philosophy. CYCU was born at a time of necessity. Since Taiwan was short of higher education institutions, foreign missionaries and Chinese Christians considered the scarcity a golden opportunity for them to launch Christian higher education. However, without a sound and complete design of their ideals, conflicts and fights arose from time to time.

The turning point came when Han Wei accepted the presidency of the university. Han (1928-84) was a tenured professor of physiology at U Penn. Through repeated contacts and persuasion from the board, Han finally decided to become the college’s president in 1970. He devoted himself to the College. One initiative he did was to bring back the Chinese scholars in the United States. The call to serve God by being “missionary teachers” touched the hearts of a number of established diaspora scholars. This group of scholars was not only quality professors, but also the mainstay of the College. Their dedication, cooperation, and academic achievements eased the tension among faculty and staff. Han and his followers took turns to become president of the College and created a golden period for a quarter century. As a result, the college also won the recognition of the academic world and achieved the level of university in 1980. This part of the essay will illustrate how they overcame various issues and reached a consensus in leadership, as well as the construction of team spirit and the completion of the mission statement and educational philosophy.

The software of CYCU came from the ideal of “holistic education” that was promoted by CYCU in 1995. At that time, the administration of CYCU was alarmed by the secularization of the whole society and hence raised the ideal of “holistic education,” which would help students to cultivate “an integrated character.” The key to CYCU’s success in “holistic education” is to give a strong emphasis on general education. Each undergraduate is required to take 34 credits of general education before graduation. The Center for General Education is in charge of course-design and its curriculum. Nowadays, this center offers 150 courses in 4 categories. The students need to take at least 4 to 6 courses in each category.

These four categories are –Tian (relationship between man and God), Ren (relationship between man and society), Wu (relationship between man and science), and Wo (self-cultivation).

Contributions of the study

The case of CYCU suggests that the holistic education might be a key to successful higher education. When the time, the higher education became secularized and the concept of earning-money dominated everything, the administration of CYCU raised the ideal of holistic education, which would help students to cultivate an integrated character. In addition to offering courses, the Center for General Education has designed a series of cultural and artistic activities each semester to complement the curriculum. By doing so, we hope to trigger students’ passion to explore the world. In addition, music, drama, lectures, and other performances are
sponsored on campus every week. The university is transformed and immersed in an atmosphere of arts and humanities, and students have plenty of opportunities to attend these events. The success story of CYCU opens a new perspective to modern higher education.

Conclusions

Three points could be drawn from the experience of CYCU. First, contemporary higher education has been under the influence of secularization of the modern society. Most universities are seen to blindly pursue academic excellence, or to lead students to pursue a profitable career. As the case of CYCU, its success came from the establishment of their educational philosophyn in 1988. The purpose of their education is to cultivate a balanced person—a whole-person who keeps balance between specialty and general knowledge. With this statement in mind, a strong, vibrant identify was created for CYCU. The faculty now has a clear goal to pursue and to dedicate while the students understand what kind of the university and campus they come to live and study.

Second, human factor plays a crucial role in shaping up the foundation of the holistic education at CYCU. Dr. Han Wei’s vision and persistence in the implementation of Christian education was the turning point for the stabilization of the university. Furthermore, his success in bringing a group of dedicated scholars who cherished the same ideals and collaborated with each other laid the foundation of a successful holistic education. Those faculty members will not only the mainstay of the university but also will carry on the mission in the future.

Third, the university should adopt a more flexible strategy in shaping a campus culture. The story of CYCU tells us that the Center for General Education has a concerted plan in its course-design and its curriculum. In addition to offering courses, the Center has designed a series of cultural and artistic activities each semester to complement the curriculum. By doing so, both the students and faculty will develop a more holistic nature and cultivate their understanding and appreciation for arts and humanities.

References

Anti-Money Laundering Law as a Legal Mechanism to Combat Corruption in Malaysia

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Abstract

Corruption has been a focal problem worldwide. Governments constantly come up with initiatives to fight against this predicate offence. Corruption involves an act of giving and taking money with a view to carry out activities against the law. To clean the proceeds of corruption, the laundering of money is utilised as it transforms 'dirty' money into 'clean' ones. Corruption and money laundering is a close-linked concept where the key aim of the corrupt is to conceal the illegal proceeds of crime and thus this is achieved through the laundering of money. Malaysia has enacted separate legislations for corruption and money laundering. The Malaysian Anti-Corruption Commission Act 2009 (MACCA) makes provisions for the deterrence of corruption while Anti-Money Laundering and Anti-Terrorism Financing Act 2001 (AMLATFA) gives power to enforcers to forfeit proceeds of crime. The purpose of this research is to investigate the legal consequences of using AML law to combat corruption in Malaysia.

Keywords: corruption, money laundering, Malaysia, AMLATFA, criminal proceeds

Introduction

Money laundering can be illustrated as the utilisation of money gained from unlawful activity by obscuring the true identity and ‘cleaning’ it to have appearance from a legitimate source. The United Nation’s Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substance which is also known as the 1988 Vienna Convention has purported the first official definition.

While money laundering involves the process of putting mask on money gained through criminal acts, corruption is considered as a serious offence, which facilitates money laundering. Corruption may be defined as dishonest or fraudulent conduct by those in power. In other words, corruption involves breaking of trusts by persons who are normally under fiduciary duties, for their own gain.

These mechanisms can be considered to have existed to deal with money laundering and corruption. While research has been conducted on the impact of corruption on money laundering, little attention is given to the usage of AML as a legal tool, especially forfeiture, to fight corruption and why mechanisms on corruption alone is insufficient. The adequacy of the legal framework and regulatory mechanisms for corruption is the main concern of this study.

Overall, this study will scrutinise into the various mechanisms in Malaysia. Close linkage between money laundering and corruption will be observed and the researcher will provide possible recommendations and suggestions on how to further improve the implementation of AML laws in combating corruption. This is to sustain the adequacy of the legal framework and regulatory mechanisms over these two concerned areas of law together.

Research Problem

There are two problems which motivate this research to be undertaken and they include the lack of focus on the close-linkage between money laundering and corruption in Malaysia as well as to what extent will the Malaysian AML laws acts as assistance to the enforcement agencies in combating corrupt activities. A study which investigates the symbiotic relationship between money laundering and corruption could remedy the situation.
Objectives of the Study

1. To examine the relationship between money laundering and corruption.
2. To examine legal and regulatory mechanisms relating to money laundering and corruption respectively.
3. To analyze legal issues in utilizing AML laws to combat corruption in Malaysia.
4. To recommend appropriate measures to improve the implementation of AML laws in combating corruption.

Research Methodology

This study will be based on a doctrinal research where reliance will mainly be on relevant case laws and legislations. AMLATFA and MACCA are key legislations which will be utilized for the purpose of analysis.

Contributions of the study

1. Boost efficiency in combating corruption & money laundering hand in hand.
2. Recognize the relationship between money laundering and corruption as close-linked
3. Add-on to the existing literature
4. Provide insights and aid future researchers, educationists, legal practitioners and law students

Conclusions

This study would most likely contribute to the government on further approaches in fighting against the laundering of corruption proceeds through money laundering process; by identifying the possibility of combining the legal framework and regulatory mechanisms in Malaysia and enhance combating tools to cater for more circumstances which causes these criminal offences to be committed; in the hope to minimize the negative effect of corruption which is carried out mostly through the process of money laundering.
The Relationship Between Science and Holistic Education

Hong Chuan Hsiang
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Abstract

Education has become gradually more subject specialization and overly inclined to knowledge and skill. Under this atmosphere, holistic education has turned into an important connotation and spirit of education. Among all is explaining the meaning of “holistic” by using the “holism” in Epistemology, hoping to amend the separation and distance between human and nature since the industrial revolution with “integrated” or “whole” spirit of knowledge and Imagination. Holistic education focused on the broken and fragmental faces of modern life and the unbalanced life and soul situations caused by these faces. Therefore, it focused on the meaning of three levels: “balance”, “inclusion” and “connection”. Meanwhile, it also emphasize that other than the connection between material and society, holistic education should also acquire the meaning of “holy” or “spiritual”.

Keywords: holistic education; general education; anthropological thinkings

Introduction

The theme of this research paper is to emphasize that “humanity” should be the foundation of holistic education through the discussion in the concerned issues of “humanity” and the majority of the classical content; through theoretical foundation, its local significance and times. Besides, the value and meaning of “humanity” are enough to complement and extend the theory of holistic education. Meanwhile, the contemporary scientific research on a variety of new issues and thinking in man or humanity can also be used to be the development and interpretation of holistic education era.

Research Problem

In recent years, more and more attention is received by the "whole person" (Holistic) education, but it is unable to be decoupled with the "human science". The main reason is due to these two concepts are mostly based on "people" as the research object and purpose - the academic areas of the "humanity" are mostly limited and defined in the "humanities". Therefore, it starts to have differences in the "psychological-and-educational-emphasized" holistic education.

Research Methodology

“Humanity” is the reflection of people their own from the highest level of the philosophy - It requires generalizations about people based their achievement on natural science (anthropology, life sciences, medicine, psychology, etc.) and social science (literature, history, political science, law, ethics, economics, etc.). It clarifies the basic principal of “what man is” and “how to be one”. Furthermore, "humanity" is the study of human existence, human nature and human activities and development as a whole. It is the basic principles of learning in the value of life, purpose, roads, etc. There are very rich and diverse outcomes from philosophy, theology, psychology, sociology or natural sciences in Taiwan's current research on "human science". In other words, the content and meaning of “humanity” have been discussed in a variety of disciplines and research.

Results /Discussions

Holistic education are easily related to "General Education", "Life Education" and "Quality Education" (Ethical education and Character Education). Is Taiwan as an example, the first school to develop and teach Life Education was Stella Matutina Girls' High School in Taichung. And for the universities and colleges in Taiwan, some religious universities all focus on developing Holistic Education. For example, the holistic education concept Chung Yuan Christian University promotes is an ‘inner construction to find 'human'. To find the
Holistic education highlights the spiritual life of human. However, only talk about the spiritual life and neglecting or denying that the material side of human's life is not balanced would be like some commentators. They discussed about that back in 1906, when Wang Guo-wei promoted the thought of putting "intellectual education, moral education and aesthetic education" through holistic education. He pointed out the connotation of holistic education is combining the goodwill and body and mid. it only focused on the unity of one's inner self but less in the man and the world. (Including the relationship between the natural world and culture world.) The "natural world" and "culture world" we talk about here is the environment and challenges that human civilization created or encountered right now. In this article, Holistic education needs exploration, cultivation, creativity, spiritual energy. Whether moral, religious or aesthetic experience and emotion, will cause the conflict between science explanations? The truth, goodness and beauty we feel most of the time, could it be a kind of scientific knowledge through the describing? That means, could the moral, beauty, and religious experience that we thought be a kind of "reasonable experience"? Or through the scientific conversations, we could find more evidence to prove those emotional experiences that we couldn't explain or to describe those abstractive thoughts in a more accurate way. If we could find enough information and proves of those abstractive experiences from the science we've developed nowadays, could it strengthen the understanding we have towards the idea of holistic? In the poem "When I Heard the Learnt'd Astronomer" by American poet Walt Whitman, the port told us, when an astronomer gave him lots of charts to read, he felt tired and annoyed. He would rather run outside and stared perfect silence at the star. This is the line that annoyed many scientists later on. The scientists didn't reduce the beautiful and surprising feeling like Whitman indicated. "When we understand nature better, the surprise scientists feel didn't decrease. On the contrary, we are even more sensitive to those mysteries that we haven't uncovered." Human are the researchers of science, and what science does is also a part of human culture. Meanwhile, "Science is only a part of humanistic history, and believing it is definitely not the most boring part."

**Contributions of the study**

The results of how humanism developed are enough to use as the understanding and preparation of holistic education. Which means that there should be an adjacent meaning between humanism and holism, or a new way of connecting. About this, cultural anthropologist Gregory Bateson once proposed a concept of "the pattern which connects" hoping to integrate the difference between subjects through the development of some kinds of thinking and cross the boundaries of knowledge.

Bateson has a deep reflection on the drawback of western education. He thinks that "breaking the connection pattern between all kinds of learning is destined to ruin the quality." And about the definition of "connection pattern". Bateson thinks science is a kind of "way to feel". Meanwhile, scientists are limited by the tools, skills and ways to feel. And all those things that were hidden under the tools or skills become something science cannot predict or prove. Through the integration of all the different information, Bateson understood the faces of a bigger pattern. This connection pattern need to understand through a "storytelling way", because if we could create a story, the small parts of the story would become the related connections. This is also the key reason why Bateson believes that everything in this world are connected. Or one step further, will we be able to see through two unrelated things and find the connected story between them?

Usually when we talk about "holistic education", we start from the main god it's happening, emphasizing on the impact and separation people got from the technology, environment, psychology and spirit of modern culture. They put people into lopsidedness and nothingness, causing the danger of culture or meaning. At the same time, the broken and reducible outlook on the world since 18th century, and the science values of materialism causing the education system affected by these wrong assumptions. "Making people defy or abuse bodies, supplying
scattered information and fragmented subjects instead of overall transdisciplinary. We didn't teach children how to love and respect nature and turning spiritual life into reasonable functions and memories.” In the 21st century, there’s is an outlook on science and the world that is different than the vertical thinking in the past. It changes the concept and ways of education. It encourages combining traditions or spiritual concept in the new subjects, and promoting the learning across subjects.

References

An Understanding of Service-Learning Outcomes among Undergraduates in an Institution of Higher Learning

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Introduction

- Service-learning teaching pedagogy or more commonly known as community engagement teaching pedagogy is a teaching and learning strategy that integrates meaningful community service with instruction and reflection to enrich the learning experience of students, teach civic responsibility and strengthen communities (Seifer & Conners, 2007).
- In Malaysia, this teaching pedagogy is gaining recognition, especially with its inclusion in the Malaysian Education Blueprint 2015-2025 (Higher Education) where service-learning is stated as one of the ways to develop students’ 21st century skills (Ministry of Higher Education, 2015).

Research Questions

- What are the civic outcomes on students who participate in service-learning project?
- What are the academic outcomes on students who participate in service-learning project?
- What are the personal and social outcomes on students who participate in service-learning projects?
- What are the challenges faced by students while carrying out their service-learning projects?
- How do lecturers view their service-learning students’ civic, academic, personal and social outcomes?

Methods

This is a phenomenological study using mainly the qualitative approach. Phenomenology aims to describe the true facts of what all the individuals of a particular phenomenon have in common as they experience the phenomenon while refraining from any pre-decided framework (Grennewald, 2004).

Preliminary Findings

Civic Outcomes
- Compassion and empathy
- Awareness of their responsibility
- Desiring to be involved in voluntary/charity activities

Academic Outcomes
- Understanding of community issues
- Understanding of environmental issues
- Appreciation of own family
- Appreciation of nature

Personal and Social Outcomes
- Teamwork skills
- Leadership skills
- Communication skills
- Conflict management skills
- Creative thinking skills
- Problem-solving skills
- Planning and organising skills

Themes of Projects

- Filial Piety
- Environment
- Underprivileged Community

“I am very blessed to have many things in my life. I have a lot of things, so I should give back some to those underprivileged.”

“I think communication skills are learning because I listen to everybody’s opinions. I also note down, I organise the points. I learn how to do the proposal according to the format.”

“I would participate in other charity projects in the future because I feel it is our responsibility to make this place, this country, this world a better place. Charity projects, they might be small, might not have much impact but at least we can bring awareness to people that what we are doing is quite good for the society. We are trying to make this society a better place.”

Bibliography


Journeying The Road Less Travelled: Empowering 21st Century Learners Through Critical Pedagogy in English Language Teaching

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Method

• Critical pedagogy is a pedagogical approach that takes into consideration the wider social contexts of learners and aims to empower students to bring forth self and social transformation (Alkawi, 2008; Kirchlese, 2008; McArthur 2005)
• It is not just a way of thinking, but a way of action. It invites students to make a change and be the change that is needed in the world
• Critical pedagogy stands at odds with most mainstream teaching, learning, research and being, hence, for many teachers, it is the road less traveled

Underlying characteristics of critical pedagogy

• Critical pedagogy is one example of a pedagogical approach that can empower 21st century learners. Teachers in this study sought to empower learners by ensuring that they negotiated and co-constructed knowledge with students, provided safe and trusting classroom environments, problem posed and researched their practice

Negotiation of Knowledge

• All teachers were engaged in knowledge sharing and knowledge development with students
• Sought students’ views on topics and content to be covered
• Flexible and moved along with the class
• Changed and evolved according to the needs of students

Trusting Environments

• Safe, trusting environment for students to critically reflect, and act on their individual situations were created
• Trust enabled students to feel confident and comfortable discussing personal and politically sensitive issues
• Two teachers strategically positioned themselves by giving voice among students

Problem-Posing

• Problem-posing raises issues that are pertinent to students
• Students become co-investigators with the teacher in finding solutions for problems, and are later guided to act upon stated problems
• Learning does not produce a ‘feel-good’ sensation. Students feel uncertain and disoriented. Only then, can they make a change

Teacher Researchers

• Nine teachers researched experiences of critical pedagogy
• Investigations were published in books, journals, on websites and were also in the form of oral presentations
• One teacher incorporated aspects of critical pedagogy in the way he conducted his research. E.g. Participatory Action Research

Critical pedagogy remains at the periphery of higher education teaching and learning and continues to be a path that is less traveled. Therefore, teachers should expect that challenge and resistance will follow. To minimize these, teachers can
1. Form communities of practice with other critical pedagogues to strengthen the position of critical pedagogy
2. Conduct action research to learn more about theory and practice

References