

the iafor

journal of education

Volume 7 – Issue 2 – Winter 2019

Editor: Yvonne Masters



ISSN: 2187-0594

iafor

IAFOR Journal of Education
Volume 7 – Issue 2 – Winter 2019

IAFOR Publications

The International Academic Forum

IAFOR Journal of Education

Editor

Yvonne Masters, Australia

Associate Editors

Lynda Leavitt, Lindonwood University, USA

Massoud Moslehpour, Asia University, Taiwan

Raimond Selke, Goethe-Institut Jakarta, Indonesia

Published by The International Academic Forum (IAFOR), Japan
IAFOR Publications, Sakae 1-16-26-201, Naka-ward, Aichi, Japan 460-0008

Executive Editor: Joseph Haldane

Publications Manager: Nick Potts

IAFOR Journal of Education
Volume 7 – Issue 2 – Winter 2019

Published December 1, 2019

IAFOR Publications © Copyright 2019

ISSN: 2187-0594

ije.iafor.org

IAFOR Journal of Education

Volume 7 – Issue 2 – Winter 2019

Edited by Yvonne Masters

Table of Contents

From the Editor	1
Yvonne Masters	
Editorial Advice	2
Yvonne Masters	
Notes on Contributors	4
Influence of School Heads' Direct Supervision on Teacher Role Performance in Public Senior High Schools, Central Region, Ghana	9
Samuel Yaw Ampofo George Adino Onyango Martin Ogola	
Faculty Target-Based Engagement Assessment Statistical Model for Enhancing Performance and Education Quality	27
Mohamed Askar	
E-learning Self-efficacy of Operating Room Nurses of a Selected Hospital in Cebu, Philippines	51
Paul John G. Aventurado	
eHealth Literacy of High School Students in the Philippines	69
Mark Kenneth S. Camiling	
Comparative Study Between Traditional and Peer Assisted Learning of Business Management Students on Accounting Module	89
Siu Wo Tarloff Im Pit Ho Patrio Chiu Michelle Ng	
Evaluation of Self and Peer Assessments in a Second Year Engineering Module	105
David Hassell Kok Yueh Lee	
Decision Making Model of Vietnamese Students Studying Higher Education in England	131
Minh Hoang Massoud Moslehpour Victoria Seitz	
Academic Staff Induction and Assessment on Implementing Experiential Learning and Reflective Practice	149
Vera Maria Nistor Don Amila Sajeevan Samarasinghe	

Independence and Interdependence of a Professional Development School Partnership	169
Robert F. Sumowski Joseph M. Peters	
Reviewers	190

From the Editor

Dear Readers,

This is the last issue for 2019 and it has been a hectic one. Our indexing with Scopus has led to a large increase in submissions (140+ for this issue) which has meant increased work for everyone involved in the journal production: reviewers, editors and publication staff. It has also meant the need to restructure the journal for the future, so 2020 looks like being another busy year. One thing that has occurred in the wake of new indexing is a number of papers submitted that are out of scope: not about education at all. This has led to development of tighter advice for 2020 and hopefully clearer guidance for authors.

In this issue, we again demonstrate the multiplicity of fields that mark education. Within this issue there are papers across a range of disciplines, including health. We are sure that you will find food for thought and reflection, and the possibility of application in your own fields. Just as the fields are diverse, our authors also come from several countries, demonstrating the international and intercultural nature of our journal.

As we move to a new structure, it is important to remember that a journal issue is not the work of any one person. I would like to thank my Associate Editors, Lynda Leavitt, Massoud Moslehpour and Raimond Selke, who support me in my role. I also thank the many reviewers who offer their service to the profession by volunteering to review the many articles submitted for each issue, providing constructive feedback to authors. These people are the backbone of the journal. Thanks also go to Nick Potts who takes the files and produces a finished product. His work behind the scenes is invaluable.

We hope that you enjoy this issue of the *IAFOR Journal of Education* and consider sharing your own research and experiences in the journal in the future. The next issue is due to be published on 1st June 2020.

Yvonne Masters
Editor,
IAFOR Journal of Education

Editorial Advice

Preparing a submission to the *IAFOR Journal of Education* is more than writing about your research study: it involves paying careful attention to our submission requirements. Different journals have different requirements in terms of format, structure and referencing style, among other things. There are also some common expectations between all journals such as the use of good academic language and lack of plagiarism. To assist you in reaching the review stage for this or any other peer-reviewed journal, we provide the following advice which you should check carefully and ensure that you adhere to.

1. Avoiding Plagiarism

Plagiarism is a practice that is not acceptable in any journal. Avoiding plagiarism is the cardinal rule of academic integrity because plagiarism, whether intentional or unintentional, is presenting someone else's work as your own. The *IAFOR Journal of Education* immediately rejects any submission with evidence of plagiarism.

There are three common forms of plagiarism, none of which are acceptable:

1. **Plagiarism with no referencing.** This is copying the words from another source (article, book, website, etc.) without any form of referencing.
2. **Plagiarism with incorrect referencing.** This involves using the words from another source and only putting the name of the author and/or date as a reference. Whilst not as grave as the plagiarism just mentioned, it is still not acceptable academic practice. Direct quoting requires quotation marks and a page number in the reference. This is best avoided by paraphrasing rather than copying.
3. **Self-plagiarism.** It is not acceptable academic practice to use material that you have already had published (which includes in conference proceedings) in a new submission. You should not use your previously published words and you should not submit about the same data unless it is used in a completely new way.

2. Meeting the Journal Aims and Scope

Different journals have different aims and scope, and papers submitted should fit the specific journal. A “scattergun” approach (where you submit anywhere in the hope of being published) is not sound practice. Like in darts, your article needs to hit the journal's “bullseye”, it needs to fit within the journal's interest area. For example, a submission that is about building bridges, will not be acceptable in a journal dedicated to education. Ensure that your paper is clearly about education.

3. Follow the Author Guidelines

Most journals will supply a template to be followed for formatting your paper. Often, there will also be a list of style requirements on the website (font, word length, title length, page layout, and referencing style, among other things). There may also be suggestions about the preferred structure of the paper. For the *IAFOR Journal of Education* these can all be found here: <https://iafor.org/journal/iafor-journal-of-education/author-guidelines/>

4. Use Academic Language

The *IAFOR Journal of Education* only accepts papers written in correct and fluent English at a high academic standard. Any use of another language (whether in the paper or the reference list) requires the inclusion of an English translation.

The style of expression must serve to articulate the complex ideas and concepts being presented, conveying explicit, coherent, unambiguous meaning to scholarly readers. Moreover, manuscripts must have a formal tone and quality, employing third-person rather than first-person standpoint (when feasible), placing emphasis on the research and not on unsubstantiated subjective impressions.

Contributors whose command of English is not at the level outlined above are responsible for having their manuscript corrected by a native-level, English-speaking academic prior to submitting their paper for publication.

5. Literature Reviews

Any paper should have reference to the corpus of **scholarly** literature on the topic. A review of the literature should:

- Predominantly be about contemporary literature (the last 5 years) unless you are discussing a seminal piece of work.
- Make explicit international connections for relevant ideas.
- Analyse published papers in the related field rather than describe them.
- Outline the gaps in the literature.
- Highlight your contribution to the field.

Referencing

Referencing is the main way to avoid allegations of plagiarism. The *IAFOR Journal of Education* uses the APA referencing style for both in-text citations and the reference list. If you are unsure of the correct use of APA please use the Purdue Online Writing Lab (Purdue OWL), – <https://owl.english.purdue.edu/owl/resource/560/01/> – which has excellent examples of all forms of APA referencing. Please note APA is used for referencing not for the general format of the paper. Your reference list should be alphabetical by author surname and include DOIs whenever possible.

This short guide to getting published should assist you to move beyond the first editorial review. Failure to follow the guidelines will result in your paper being immediately rejected.

Good luck in your publishing endeavours,

Dr Yvonne Masters
Editor, *IAFOR Journal of Education*
<https://iafor.org/journal/iafor-journal-of-education/>

Notes on Contributors

Article 1: Influence of School Heads' Direct Supervision on Teacher Role performance in Public Senior High Schools, Central Region, Ghana

Dr Samuel Yaw Ampofo is a full-time lecturer in Educational Administration and Management at the College of Distance Education, University of Cape Coast, Ghana. He received his BEd (Foundations) and MPhil (Administration in Higher Education) from the University of Cape Coast. He obtained his PhD (Educational Administration) from Kenyatta University, Nairobi- Kenya. He has over nine (9) years teaching experience at the tertiary education level and has also held various managerial positions. He is currently the Co-ordinator of Quality Assurance and Enhancement Unit of the College of Distance Education at University of Cape Coast. His research interests include issues on financing tertiary education, school supervision and management, and distance education. He has published in a number of peer review journals and actively participated in different research endeavours.

Email: sampofo@ucc.edu.gh

Dr George Onyango is a Lecturer in the Department of Educational Management, Policy and Curriculum Studies, Kenyatta University, Kenya. Dr Onyango's areas of academic interest and research include Educational Management, Policy Studies, Principalship, Instructional Supervision and Educational Research. To date, he has supervised both PhDs and masters theses and published in a number of internationally referred journals. George holds a BA (Hons), BEd, MEd, MPhil (Education, Management) from Delhi University and a PhD from Kenyatta University. He was Chairman, Department of Educational Management Policy and Curriculum Development from 2010-2014. He is currently the Dean, Digital School of Virtual and Open Learning, Kenyatta University as well as the Chairman of the University Programmes Development Committee. He also sits, as a member, in numerous other committees of the University.

Dr Martin Ogola teaches educational leadership and management and is currently the Chairperson of the Department of Educational Management Policy and Curriculum Studies, Kenyatta University, Kenya. He holds a PhD and a masters degree in Educational Management and Policy and a BEd degree from Kenyatta University. Martin is an experienced researcher with interest in school management and leadership, education policy, and health in schools. He has been involved as a researcher in several evaluations. He is a member of several professional organizations including Kenya Association of Educational Administration and Management (KAEAM), The Society of Educational Research and Evaluation in Kenya Member, and Education Evidence for Action Network.

Email: martinogola@gmail.com

Article 2: Faculty Target-Based Engagement Assessment Statistical Model for Enhancing Performance and Education Quality

Dr Mohamed Askar, Professor of Construction Engineering and Management, earned his PhD in Construction from the Brandenburg University of Technology Cottbus in Germany. He is currently teaching at the Engineering and Technology Department, Utah State University, in the USA. He has completed about 30 years in teaching, participating in research programs, advising MSc and PhD students, and contributing to services to the university, profession and society. Dr Askar is an author of several articles, conference proceeding papers, and books. His research and consultation interests include problems related to the construction industry,

teaching evaluation, and enhancing Engineering education. Dr Askar has more than 25 years of experience in managing and leading a group of construction companies in the Middle East, Asia, Europe and USA.

Email: mohamedaskar@suu.edu

Article 3: E-learning Self-efficacy of Operating Room Nurses of a Selected Hospital in Cebu, Philippines

Dr Paul John G. Aventurado holds a PhD in Nursing Science from Cebu Doctors' University, Mandaue City, Cebu, Philippines. He is a registered nurse, working as faculty of the university, specializing in research, medical-surgical nursing and informatics. He is also the research coordinator of the CDU College of Nursing, mentor and co-author of CDU Graduate School research papers, and a peer reviewer of various international journals. He was recently elected as the president of the Philippine Nursing Research Society Incorporated – CDU cell, and will spearhead the Knowledge Generation and Publication (KGAP) project of the college. He was recently awarded a publication incentive grant from Cebu Doctors' University. His research interests include e-learning, health intervention and theory development.

Email: pjaventurado0521@gmail.com

Article 4: eHealth Literacy of High School Students in the Philippines

Mark Kenneth S. Camiling presently serves as the Lower School Assistant Principal for Academic Affairs at Miriam College, Philippines. Concurrently, he teaches undergraduate and graduate classes at the higher education unit of the same institution. He handles courses on early childhood science and health education, research methods and data analysis techniques for teachers, and principles of teaching. He obtained both his undergraduate (Bachelor of Secondary Education-Special Education) and graduate (Master of Arts in Education-Health Education) degrees at the University of the Philippines Diliman. His Australia Awards fellowship at Queensland University of Technology in Brisbane, Australia inspired him to pursue eHealth literacy as the topic for his master's thesis. Apart from health education, his research interests include educational technology and educational psychology. He has also authored numerous health textbooks for elementary and high school students in the Philippines.

Email: mark.camiling@gmail.com

Article 5: Comparative Study Between Traditional and Peer Assisted Learning of Business Management Students on Accounting Module

Mr Tarloff Im is an Education Development Officer at the City University of Hong Kong - Office of Education Development and Gateway Education (EDGE). He received his first degree, BSc in Engineering Physics, from The Hong Kong Polytechnic University, then he gained an MSc in E-Commerce Technologies from The Chinese University of Hong Kong; MA in Communication and New Media from City University of Hong Kong; and a PgDip in Education (Professional and Vocational Education) from the Education University of Hong Kong with Dean's Honour List. Tarloff has experiences in programme development, quality assurance of academic programmes, and e-Learning development. His current research interests include XR technology for teaching and learning, peer-assisted-learning, and active learning.

Email: sw.im@cityu.edu.hk

Dr Pit Ho Patrio Chiu is a Senior Education Development Officer at the City University of Hong Kong – Office of Education Development and Gateway Education (EDGE). He received his BEng (Hons), MEng, and PhD in Electrical Engineering, from McGill University, Canada, and a PgD Ed from the Hong Kong Institute of Education (now the Education University of Hong Kong). He is named on the Dean's Honour List at both institutes and is also a Dean's Scholar at Queen's University, Canada. He worked in the R&D industry and served in the Canadian Space Agency.

Email: patrio.chiu@cityu.edu.hk

Article 6: Evaluation of Self and Peer Assessments in a Second Year Engineering Module

Dr David Hassell is currently a Senior Teaching Fellow in the Department of Chemical Engineering at the University of Bath. After obtaining a MEng and PhD in Chemical Engineering from the University of Sheffield, he undertook research at the University of Cambridge before moving to South East Asia where he taught at three different Universities within the region prior. He joined his current institution in 2018 and his current research interests relate to the application of pedagogical approaches both broadly as well as specifically within engineering education.

Email: dgh29@bath.ac.uk

Dr Lee Kok Yueh is a lecturer at the Centre for Communication, Teaching and Learning, Universiti Teknologi Brunei, Brunei Darussalam. She received her doctoral degree in English Language from the University of Birmingham, United Kingdom. Her current research interests include genre and corpus analyses of spoken and written discourse in areas of communication, as well as teaching and learning in higher education.

Email: kokyueh.lee@utb.edu.bn

Article 7: Decision Making Model of Vietnamese Students Studying Higher Education in England

Ms Minh Hoang, Lecturer in Marketing, earned her MSc in International Marketing from Sheffield Hallam University in the UK. She currently serves as Senior Lecturer and Associate Dean of Department of Business Administration at Saigon Institute of Technology, Vietnam. She has taught for two years and participated in the research, advising students and providing service to the university profession and society. Her research and consultation interests include problems related to higher education, customer behavior and satisfaction, and marketing management.

Email: minhhtb@saigontech.edu.vn

Dr Massoud Moslehpour is an Associate Professor of Foreign Languages, Business, and Management. He earned his PhD in Industrial Technology from the University of Missouri-Columbia. He is currently teaching at the Business Administration Department, Asia University, in Taiwan. He has 25 years of international teaching and guest lecturing experience in countries such as the United States, Spain, Iran, Taiwan, Indonesia, Mongolia, Vietnam, and China. Dr Moslehpour is a distinguished educator and an active researcher. He enjoys advising MSc and PhD students, contributing to the university, profession, and society. Dr. Moslehpour is the author of several internationally published professional refereed articles, conference papers, and textbooks. His research and consultation interests include problems related to higher education, customer satisfaction, and marketing management. Dr. Moslehpour has

served as the chairman of the Language Center and International Affairs Office in his 25 years of working experience.

Email: writetodrm@gmail.com

Dr Victoria Seitz, Professor of Marketing, earned her PhD in Marketing and Merchandising from Oklahoma State University. She currently serves as professor and chair of the Marketing Department at California State University San Bernardino in the USA. She has taught for over 30 years and participates in research, advising students and providing service to the university profession and society. Dr Seitz has published five books on Image Marketing and over 100 articles in journals and conference proceedings. Dr. Seitz has received four Fulbright awards to Romania where she conducted research in advertising and marketing.

Email: vseitz@csusb.edu

Article 8: Academic Staff Induction and Assessment on Implementing Experiential Learning and Reflective Practice

Ms Vera Maria Nistor is a Lecturer with the English Department at Otago Polytechnic Auckland International Campus New Zealand, having worked in adult education in different countries for over 10 years. Holding a Cambridge Delta qualification, she is currently teaching English for Academic Purposes to international students who are pursuing postgraduate studies in New Zealand. Vera has also helped facilitate academic staff induction programmes, by supporting other staff in their use of experiential learning and reflective practice. As a member of the experiential learning team, she has experience in using the OP Observer digital tool for measuring the learner-centredness of classes, in order to increase the staff's quality of teaching. Her research interests in the field of education include interdisciplinary research on experiential learning and learner-centred teaching practice and their applicability across different academic subjects.

Email: Vera.Nistor@op.ac.nz

Dr Don Amila Sajeevan Samarasinghe is a Senior Lecturer in Construction at Otago Polytechnic Auckland International Campus (OPAIC). He has ten years of experiential learning and reflective practice-based teaching experience in the New Zealand tertiary education sector. His qualifications include a PhD in Construction Management (New Zealand), a Graduate Diploma in Tertiary Education (New Zealand) and a First Class Honours Bachelor of Civil Engineering degree (Sri Lanka). He is experienced in designing graduate outcomes, course descriptors, learning outcomes, assessments, marking guides, rubrics, lesson plans and learner capabilities for construction programmes. Dr Samarasinghe has actively participated in academic staff professional development, supporting other staff and working collaboratively to enhance the learning experience for students and the teaching experience for staff. As an active member of the experiential learning team, he used the OP Observer digital tool to observe and measure the learner-centredness of classes at OPAIC.

Article 9: Independence and Interdependence of a Professional Development School Partnership

Dr Robert F. Sumowski is an Assistant Professor of Special Education at Georgia College & State University in Milledgeville, Georgia. He holds an Ed D in Educational Leadership from the University of Georgia. With a research emphasis on behavior management, Sumowski has served on the State Leadership Team of the Positive Behavior Interventions and Supports (PBIS) program of the Georgia Department of Education since 2013 and on the advisory board

for the Georgia Association of Positive Behavior Support. In 2018-19, he served on the PBIS Task Force of the Georgia Professional Standards Commission, co-authoring the state standards and guidance documents for Georgia's teaching certificate endorsement in PBIS. From 2015-18, he served as a professor-in-residence assisting Baldwin County (GA) Schools with PBIS implementation and the reconstitution of the district's system of behavior management. Sumowski is a former teacher, behavior specialist, school-based administrator, and district-level director of student safety and management.

Email: robert.sumowski@gcsu.edu

Dr Joseph M. Peters is the Dean of Education at Georgia College & State University in Milledgeville, Georgia. He holds a BA in Elementary Education from Mercyhurst College, an MEd in Natural Science and Environmental Education from Gannon University, and a PhD in Science Education from the University of Pittsburgh. His positions include teaching and research at the University of West Florida, the University of Florida, Northern Marianas College, and Chaminade University prior to joining Georgia College & State University. Dr Peters is the Editor Emeritus of the Journal of Elementary Science Education and author of numerous books, chapters, and articles. His research interests include professional development school partnerships, cultural literacy, and promoting STEM.

Email: joseph.peters@gcsu.edu

Influence of School Heads' Direct Supervision on Teacher Role Performance in Public Senior High Schools, Central Region, Ghana

Samuel Yaw Ampofo
University of Cape Coast, Ghana

George Adino Onyango
Kenyatta University, Kenya

Martin Ogola
Kenyatta University, Kenya

Abstract

This study assessed the influence of school heads' direct supervision on teacher role performance in public senior high schools. The study adopted the embedded mixed methods design. Slovin's formula, the proportional allocation method, and simple random and purposive sampling were used to select a sample of 617 respondents comprising 295 teachers, 222 class prefects, 86 Heads of Department, 13 school heads and 1 Regional Director for the Inspectorate Division of the Ghana Education Service. Data were collected through questionnaires and interview guides. Quantitative data were analyzed using frequencies, means and multiple regression whereas patterns and themes were developed for the analysis of qualitative data. The study found that school heads allocated very little time for supervision of lesson planning and delivery of teachers. The study established that school heads' lesson planning supervision ($p= 0.043 < .05$) and lesson delivery supervision ($p= .035 < .05$) had a significant influence on teacher role performance. Therefore, the study recommends the Ghana Education Service to dedicate a greater portion of the promotion requirement of the school heads to evidence of direct supervision of teachers and a reduction in the teaching load of Heads of Department by the school head to enable them play more instrumental roles in the instructional supervision process.

Keywords: assessment practices supervision, direct supervision, lesson delivery supervision, lesson planning supervision, teacher role performance

Introduction

Formal education is widely acknowledged to play critical roles in both individual and societal development. It is considered an investment that accrues both private and social returns and hence, is functional for individual and national progress, irrespective of the level at which it is provided (Asafo-Adjaye, 2012). For formal education to achieve its goals, key actors such as school heads and teachers must fully accomplish their roles and responsibilities. Teachers are in the best position to make decisions that directly affect students' well-being and achievement (Stark, McGhee, & Jimerson, 2017). Therefore, one key concern for success of educational institutions is to ensure that teachers are well supervised. As Adu, Akinloye and Olaoye (2014) intimated, supervision (whether internal or external) should be considered a deliberate effort aimed at enhancing the outcomes of each educational institution. It is a process of involving teachers in instructional dialogue for the purpose of improving teaching and increasing student achievement (Sullivan & Glanz, 2013). The term "instructional supervision" refers to the cycle of activities between a supervisor and a teacher targeted at improving classroom performance (Ekyaw, 2014). Undoubtedly, the most important supervision and guidance in the school setting is that given by the head of the school (Mofareh, 2011). Effective instructional supervision by the school head is critical to the realization of the outlined objectives of the school (Mankoe, 2007). These heads carry out instructional supervision through various instructional supervision practices which includes direct supervision to teachers. The concept of direct supervision as a form of instructional supervision refers to all the measures by the school head to facilitate one-on-one feedback with teachers to enhance instruction and professional capacity (Glickman, Gordon & Ross-Gordon, 2009). In this study, senior high school heads' supervision of lesson planning, lesson delivery and assessment practices were considered.

The key concern of instructional supervision practices by the school head is to improve schools and students' achievements by helping teachers to deliver adequately in their role performance (Sergiovanni & Starratt, 2007). Teacher role performance generally includes activities that teachers professionally perform in the classroom in relation to their areas of specialization (Joshua, Ekanem & Agborbechem 2007). In this study, teacher role performance refers to the development of good instructional documents, effective lesson delivery, regular assessment of students, regular and punctual school and class attendance, effective use of instructional time, and exhibiting good working relations. In effect, instructional supervision gives teachers opportunities to collaborate, set goals, understand how their students learn and become better teachers through improvement in their role performance (Kalule & Bouchamma, 2014; Sullivan & Glanz, 2013).

Teachers' schemes of work and lesson plans are the most vital instructional documents that aid effective instructional delivery. Schemes of work and lesson plans clearly define the structure and content of a course and map out how resources, class activities and assessment strategies will be used to ensure attainment of course objectives (Gakuya, 2013). This is confirmed by Too, Kimutai and Kosgei's (2012) study on the impact of head teachers' supervision of teachers on students' academic performance in the Kenya Certificate of Secondary Education. The study findings revealed the existence of a positive relationship between head teachers' inspection of teachers' instructional documents and performance of students in national examinations. This implies that head teachers' inspection of teachers' instructional documents (schemes of work and lesson plans) is a predictor of students' performance in national exams. Thus, in order to ensure effective instructional delivery of teachers, Afolabi and Lato (2008)

recommend that school heads critically examine various items of the lesson plan such as adequacy and relevance, appropriateness and clarity of learner behavioral objectives, and selecting appropriate teaching/ learning resources and evaluation techniques. Researching the strategies for improving supervisory skills for effective primary education in Nigeria, Enaigbe (2009) describes lesson planning as a reflection of the effort made by the teacher to gather information for the lesson.

In a study on the relationship between principals' supervisory strategies and teachers' instructional performance in primary schools in Delta North Senatorial district, Nigeria, Osakwe (2010) discovered a significant relationship between the principal's supervisory strategies and teachers' instructional performance in terms of teaching materials and discipline maintenance. In their study on the impact of selected models of instructional supervision activities on students' academic performance in senior high schools in Ondo State, Nigeria, Alimi and Akinfolarin (2012) established a significant impact of school heads checking of students' notes, class exercises and visitations, moderation of examination questions and marking schemes on students' academic performance in English Language. The study recommended that school heads must be keen in checking students' assessment records, such as notes given by teachers and class exercises, to ensure that teachers are effectively carrying out instructional activities. Thus, the assessment of students in any educational setting is of paramount importance to the success of such institutions (Ampofo, Bizimana, Mbuthi, Ndayambaje and Orodtho, 2014). Teachers are expected to regularly assess students with the aim of enhancing students' performance, whereas school heads oversee the appropriate execution of teachers' assigned responsibilities, which includes assessment of students.

Research has shown that school head's direct supervision of teachers is concerned with improvement of the conditions that surround learning, pupil growth and effective teacher role performance in the school system (Alemayehu, 2008). A related study by Glanz, Shulman and Sullivan (2007) in the United States of America revealed that direct supervision of school heads in the instructional supervision process focuses on identifying pedagogical challenges encountered by their teachers in their instructional delivery and providing them with needed support to overcome them. In the Indian context, Tyagi (2010) emphasized that direct supervision creates a platform for both teachers and school heads to use their collective expertise in self-appraisal of teachers, to identify gaps in teacher skills, knowledge and competencies in order to provide the vital support needed for teachers' professional development.

Research studies in Africa have revealed that effective instructional supervision through direct supervision practices of heads contributes to improvement of the education sector. Considering the case of Kenya, findings of a study by Wanzare (2011) on instructional supervision in public secondary schools showed that school heads' direct supervision improves the quality of teachers and teaching, facilitates students' academic performance and provides the opportunity to monitor teachers' instructional work. Panigrahi's (2012) study on implementation of instructional supervision in secondary schools in Ethiopia found that classroom visits enable head teachers to interact with teachers, determine whether teachers are issuing sound instruction and provide feedback to help teachers correct highlighted issues. In the case of Nigeria, a study by Asiyai (2009) showed that regular instructional supervision practices of the school head through direct supervision of teachers led to improvement in teacher lesson preparation, regular and punctual class attendance and participation in school community relations.

In the Ghanaian context, senior high school heads carry out direct supervision as a key component of their administrative responsibilities aimed at ensuring teachers perform for realization of school goals. Direct supervision roles of the senior high school heads include the supervision of day to day teaching and learning, ensuring the adherence of teachers to the school time table, facilitating provision of appropriate and adequate instructional delivery by teachers, ensuring punctuality and regularity by both staff and students, and providing direct assistance on varied issues of concern to teachers (Ghana Education System [G.E.S] as cited in Sekyere, 2014). Recent reports, however, indicate some challenges in teacher role performance characterized by absenteeism, lateness and poor use of instructional time (Dickson, 2011). The Metropolitan Annual Performance Reports on Education for Cape Coast indicates pronounced teacher absenteeism and lateness especially in the first week of reopening in senior high schools (G.E.S, 2015). Additionally, public senior high schools in the Abura Asebu Kwamankesse (AAK) district have been performing abysmally in the West African Senior Secondary Certificate Examination (WASSCE) which is attributed to factors such as teachers' inadequate pedagogical knowledge and skills, application of inappropriate approaches of instruction and poor use of instructional time (Osei-Mensah, 2012). Various studies have continually demonstrated that effective instructional supervision practices by school heads lead to improvement in teacher role performance, but this is not the case in the study locale since, teachers are not performing their assigned tasks. This is negatively affecting senior high schools in terms of non-completion of syllabus, students' absenteeism and poor students' performance.

There is therefore a growing perception among the populace that teachers are not performing their assigned roles as expected because school heads are not carrying out their direct supervision. However, this remains a perception since there is a dearth of literature on scientific studies that confirm or deny this assertion. This study therefore sought to explore the extent to which direct supervision practices (activities) of school heads account for teachers' role performance in the study locale. Thus, the current study examines the influence of school heads' direct supervision on teacher role performance in selected public senior high schools in Central Region, Ghana. Specifically, the study intended finding answers to the following research questions.

1. To what extent do school heads offer lesson planning supervision to teachers?
2. What level of assistance do school heads offer to teachers through lesson delivery supervision?
3. To what extent do school heads assist teachers through assessment practices supervision?

The following research hypothesis guided the study: there is no statistically significant influence of school heads' direct supervision to teachers on teacher role performance in public senior high schools, Central Region, Ghana.

Theoretical Framework

This study was anchored in the General Systems Theory propounded by Ludwig von Bertalanffy. He interpreted "systems" to mean complexes of elements standing in interaction. The theory investigates the component of a phenomenon, examines the interaction between the components and the relationship that exists between the components and their larger environment. (Bertalanffy, 1968). In reference to the educational system, the General Systems

Theory recognizes the interdependencies and interrelationship among the parts of the education system (Jenlink, Reigeluth, Carr, & Nelson, 1996). Thus, any changes in one part of the education system is likely to affect other parts of the system. In the school setting, variation in a particular component is likely to result in variations in the interdependence between the other components (students, teachers, school authorities, parents, and many more).

Applying the above specifically to this study, the senior high schools in Ghana in general are independent systems with various components such as educational authorities, school heads, students, staff, parents and the community interacting continuously to achieve objectives. Changes in any of the components are likely to affect the others. Therefore, variations in school heads' supervision of lesson planning supervision, lesson delivery and assessment practices are likely to cause a change in teacher role performance in senior high schools.

Methodology and Methods

This study employed an embedded mixed methods design (Creswell, 2014; Creswell & Clark, 2011; Onwuegbuzie, 2012) which involved the collection and analysis of both quantitative and qualitative data within a traditional quantitative research design. This design was suitable for the study because it provided the opportunity for the collection and analysis of both quantitative and qualitative data (Creswell & Clark, 2011) which involved embedding the two strands of data to explain a research problem. It offered the opportunity for the researcher to refine and explain the quantitative data better (Creswell, 2014).

The target population for the study was 1,638 subjects comprising 1,132 teachers, 406 class prefects, 86 HoDs, 13 school heads and the Regional Director for the Inspectorate Division of GES. Slovin's formula (Amin, 2005), a proportional allocation method (Kothari 2013) and simple random sampling were used to select the teachers, and class prefects, whereas a purposive sampling technique was employed to select the school heads, Heads of Department (HoDs) and the Regional Director of the Inspectorate Division of the Ghana Education Service (G.E.S.). The reliability coefficient of the questionnaires was established using Cronbach's Alpha formula and was found to be 0.88 for teachers, 0.76 for class prefects and 0.79 for heads of department. In all, a sample size of 617 respondents comprising 295 teachers, 222 class prefects, 86 HoDs, 13 school heads and 1 Regional Director for the Inspectorate Division of GES was used for the study. The participants for the interviews included all the 13 school heads, 25 teachers (constituting 10% of the teachers who had already responded to the teachers' questionnaire) and the Central Regional Director of the Inspectorate Division of the GES. The main focus of the interview was to ascertain clarification on some of the emerging issues from the quantitative data analysis. Themes were generated from the qualitative data in accordance with the emerging issues and used to support the quantitative findings. Data were collected through questionnaires and interview guides.

Simple frequencies, percentages, means, standard deviations and multiple regression were used in analyzing the quantitative data and was presented in tables. Questionnaire items were judged in accordance with parameters given by Kibuuka, Kiweewa, Nakate & Kizza (2013) and Beinomugisha, Kanya & Said (2014). Thus, calculated mean value of between 4.21 and 5.00 for a particular item meant very high respondents' agreement with the statement, 3.41-4.20 indicates high respondents' agreement and 2.61-3.40 connotes fair agreement with the statement. On the other hand, a calculated mean value between 1.81 and 2.61 showed low respondents' agreement/high disagreement with a statement and 1.00-1.80 displayed a very low respondents' agreement.

Ethical Considerations

The investigator obtained permission from the Central Regional Director of the Ghana Education Service to establish the authenticity of the researcher's request for assistance from heads of the sampled schools. Formal informed consent letters were issued to all respondents to assure them of confidentiality and anonymity of the information they provided. Respondents were informed that participation in the study was voluntary and their withdrawal was respected. Pseudonyms were used for interviewees to conceal their identity. Data gathered was transcribed verbatim. All sources of information for the study such as writings and research works cited were acknowledged through proper referencing.

Results

School Heads' Lesson Planning Supervision

The first question sought to find out the extent to which school heads offer lesson planning supervision to teachers in public senior high schools in Central Region, Ghana. Table 1 presents responses of teachers on the level of lesson planning supervision they received from their headmasters/headmistresses.

Table 1: Teachers' responses on direct supervision from school heads through lesson planning supervision

Lesson Planning Supervision	Very Often		Often		Sometimes		Seldom		Never		Mean	SD
	n	%	n	%	n	%	n	%	n	%		
Termly inspection of scheme of work	7	2.8	58	23.1	32	12.7	44	17.5	110	43.8	2.53	1.2
Discussion of challenges on preparation of scheme of work	10	4.0	38	15.1	89	35.5	39	15.5	74	29.5	2.51	1.3
Offers suggestions to help improve on the preparation of my scheme of work	23	9.2	61	24.3	58	23.1	45	17.9	64	25.5	2.65	1.2
Weekly Vetting of lesson plan/notes	10	4.0	53	21.1	83	33.2	56	22.3	49	19.5	2.54	1.3
Ensures lesson objectives are clear and achievable	29	11.6	66	26.3	77	30.7	29	11.6	50	19.9	2.98	1.3
Offers suggestions to improve my lesson plans/notes	15	6.0	72	28.7	76	30.3	37	14.7	51	20.3	2.85	1.2
Helps to select appropriate teaching/learning resources	10	4.0	44	17.5	69	27.5	55	21.9	73	29.1	2.45	1.2

Note: Very Often= 5, Often= 4, Sometimes= 3, Seldom=2 and Never=1

As shown in Table 1, the teachers involved in the study expressed a mostly negative reaction to the lesson planning supervision they received from their school heads, since most of the responses had mean values ranging between 2.45 and 2.54. This implies that lesson planning supervision (ie. termly inspection of schemes of work, discussion of challenges on preparation of schemes of work, weekly vetting of lesson plan/notes) is poorly carried out by school heads in the study location. It is worth nothing that other aspects of lesson planning supervision (ie ensuring clear and achievable lesson objectives and offering suggestions to improve lesson plans) was averagely ensured as depicted in a mean above 2.61. Again, the respondents ranked the practice of school heads ensuring that the teachers' lesson objectives are clear and achievable highest (M=2.98) among the lesson planning supervision activities, whereas helping teachers select appropriate teaching/learning resources was ranked least.

School Heads' Lesson Delivery Supervision

The second research question was to ascertain the level of assistance school heads offer to teachers through lesson delivery supervision in public senior high schools in Central Region, Ghana. The responses of the teachers are as captured in Table 2.

Table 2: Teachers' responses on direct assistance from school heads through lesson delivery supervision

Lesson Delivery Supervision	Very Often		Often		Sometimes		Seldom		Never		Mean	SD
	n	%	n	%	n	%	n	%	n	%		
Ensures that I keep to time for lesson delivery	54	21.5	91	36.3	39	15.5	26	10.4	41	16.3	3.32	1.4
Classroom visitation and supervision	21	8.4	43	17.1	95	37.8	45	17.9	47	18.7	2.78	1.2
Fulfilling outlined instructional activities in lesson plan/notes	22	8.8	74	29.5	69	27.5	41	16.3	45	17.9	2.94	1.2
Keeping to allocated instructional time	28	11.2	70	27.9	70	27.9	33	13.1	51	19.9	2.97	1.3
Supervising manner of asking/ distributing questions and moderating feedback	6	2.4	26	10.4	83	33.1	47	18.7	89	35.3	2.23	1.1
Ensures adequate delivery of subject content	24	9.6	47	18.7	71	28.3	46	18.3	63	25.1	2.69	1.3

Note: Very Often= 5, Often= 4, Sometimes= 3, Seldom=2 and Never=1

As reported in Table 2, the majority of the respondents responded positively to the issue of school heads' lesson delivery supervision. The table shows that a mean range of 2.69 to 3.32 for all the items measuring the construct. This implies that most of the respondents agreed with almost all the items under consideration, except the supervision of the manner of asking/ distributing questions and moderating feedback among students which had a mean score of 2.33. The low mean score shows low respondents' agreement with the statement. Thus, the teachers were generally of the opinion that school heads did not undertake this particular

supervision practice as appropriately as expected. It is worth noting that the item on school heads ensuring teachers keep to time for lesson delivery as indicated on the timetable was ranked highest.

School Heads' Assessment Practices Supervision

The third research objective was to ascertain the level of supervision teachers receive from school heads through assessment practices supervision in public senior high schools in Central Region, Ghana. The views of the teachers on this issue are as depicted in Table 3.

Table 3: Teachers' responses on direct assistance from school heads through assessment practices supervision

Assessment Practices	Very Often		Often		Sometimes		Seldom		Never		Mean	SD
	n	%	n	%	n	%	n	%	n	%		
Ensures provision of opportunity for all students to participate fully in lessons	21	8.4	63	25.1	71	28.3	39	15.5	57	22.7	2.81	1.27
Makes sure that all teachers in the school receive supervisory feedback	27	10.8	67	26.7	67	26.7	43	17.1	47	18.7	2.93	1.27
Praises teachers for specific teaching behaviours	36	14.3	61	24.3	84	33.5	34	13.5	36	14.3	3.10	1.23
Discusses performance of pupils with teachers	79	31.5	88	35.1	46	18.3	22	8.8	16	6.4	3.76	1.17
Ensures that continuous assessment records are kept up-to-date by teachers	96	38.2	101	41.4	23	9.2	13	5.2	15	6.0	4.00	1.11

Note: Very Often= 5, Often= 4, Sometimes= 3, Seldom=2 and Never=1

The figures in Table 3 display a generally positive agreement of the respondents to all the items on the issue of school heads instructional supervision through the supervision of teachers' assessment practices. The table shows a mean range between 2.81 and 4.00 for all the items, implying that the respondents highly agreed with most of the statements. Thus, the respondents are generally of the view that school heads usually offer supervision to teachers in the form of supervising their assessment practices. Notably, the item on ensuring that teachers keep up to date records of students' continuous assessment was ranked highest.

A null hypothesis was formulated and tested using standard multiple regression analysis to examine the influence of school heads' direct supervision of teachers on teacher role performance in public senior high schools. The results of the Standard Multiple Regression are as summarized in Table 4.

Table 4: Standard Multiple Regression analysis of school heads' direct supervision and teacher role performance

DV: Teacher Role Performance					
	Constant	Multiple r	R Squared (R ²)	Beta (β)	P- Values
PREDICTOR					
Lesson Planning Supervision (LPS)	3.817	.354	.125	.525*	.043
Lesson Delivery Supervision (LDS)				.204*	.035
Assessment Practices Supervision (APS)				.453	.461

NOTE: *p< .05

Table 4 shows the results of the standard multiple regression of school heads' direct supervision of teachers (LPS, LDS and APS) as predictor variable and teacher role performance as a dependent variable. Table 4 indicates R² as .125, implying that 12.5% of variation in teacher role performance is explained by school heads' direct supervision to teachers (LPS, LDS and APS). It is also clear from Table 4 that the p-values for LPS and LDS are lower than the significance level, LPS (β=. 525, p= 0.043< .05), LDS (β= .204, p= .035< .05). The p-value for APS is however higher than the significant level (β= .453, p= .461> .05). This means that Lesson Planning Supervision (LPS) and Lesson Delivery Supervision (LDS) make significantly unique contribution to the prediction of the dependent variable (Teacher Role Performance). Hence, the study rejected the null hypothesis that there is no statistically significant effect of school heads' direct supervision to teachers on teacher role performance in public senior high schools in Cape Coast Metropolis and Abura Asebu Kwamankese District, Central Region, Ghana. This implies that school heads' direct supervision to teachers is a positive determinant of teacher role performance and thus, improved LPS and LDS would lead to better teachers' role performance.

The regression model is as follows:

$$\text{Predicted TRP} = 3.817 + 0.525(\text{LPS}) + 0.204(\text{LDS}) + \epsilon$$

Where TRP= Teacher Role Performance, LPS=Lesson Planning Supervision, LDS= Lesson Delivery Supervision and ϵ = Error Term.

Discussion

School Heads' Lesson Planning Supervision

Lesson planning forms a major component of the teaching-learning process. Considering that the teachers' scheme of work constitutes the fundamental basis for any teacher's professional delivery, it is worrying that less attention is paid to its preparation by school heads in the study locale. As indicated by Gakuya (2013), schemes of work define the structure and content of a course and clearly outline how resources, class activities and assessment strategies will be used to ensure that the learning aims and objectives of a course are met. Again, the study by Too, Kimutai and Kosgei (2012) found a positive relationship between head teachers' inspection of teachers' schemes of work and performance of students in national exams. The school heads'

poor performance of this responsibility is likely to negatively affect the teacher's role performance in terms of preparation of good instructional documents if not checked.

The findings also show that lesson plans are not vetted regularly by the school heads. This contradicts the expectations from senior high school heads who are admonished to critically and consistently examine various items of the lesson plan for effective instructional delivery of teachers (Mankoe, 2007) as well as the G.E.S. policy on instructional supervision which authorizes school heads to regularly vet the weekly lesson plans of all teachers in conformity to required standards (G.E.S, as cited in Sekyere, 2014). Again, it opposes the position of Afolabi and Lato (2008) that school heads must check the adequacy and relevance of lesson notes, appropriateness and clarity of learner behavioural objectives, selecting appropriate teaching/ learning resources and evaluation techniques as well as offering suggestions where necessary to improve instructional documents.

On the issue of whether school heads helped their teachers to select appropriate teaching /learning resources for their lessons, the findings show that this is hardly done. This is likely to affect teachers' ability to deliver lessons effectively. This finding resonates with the views of some of the sampled teachers who were interviewed. One of them lamented that:

My school head never makes sure the needed teaching /learning resources are even provided, let alone help teachers to select the appropriate ones for their lessons. He is mostly interested in ensuring that we go to class on time. He does not have time for that. He rather concentrates on other administrative duties.

The findings of the study portray that the school heads scarcely help teachers to choose appropriate teaching/learning resources for lesson delivery. This finding is at variance with Osakwe (2010) who posited that there is a significant relationship between the school head's supervisory strategies and teachers' instructional performance in terms of teaching materials. Osakwe opined that if school heads could help teachers choose appropriate teaching/learning resources, it could positively influence teaching because that would facilitate the learners' understanding of abstract concepts (Osakwe, 2010). This implies that there is the likelihood of students in senior high schools not grasping concepts taught in various subjects in the study locale which may lead to poor students' performance.

School Heads' Lesson Delivery Supervision

The results portray high commitment of school heads to the checking of teachers' punctuality and effective use of instructional time. These school heads ensured that teachers kept to time for lesson delivery as indicated on the timetable. This finding is corroborated by the views of some of the school heads who were interviewed. One of them affirmed that:

Occasionally, I go round to check if the teachers are in their classrooms teaching at the time stated on their respective timetables. However, because I have a lot to do as the head, I have delegated the duty of regular supervision of instruction to my assistant in charge of academic, but I bear the ultimate responsibility.

The commitment of the school heads to the practice of ensuring teachers' punctuality and effective use of instructional time is in tandem with the view of Enaigbe (2009) who found the instructional supervision activities of the school head to include seeing to it that teachers

engage in meaningful instructional activities and keep to allocated instructional time. This could help to enhance the attainment of instructional objectives, culminate in timely completion of syllabuses and improve students' performance.

According to the study findings, school heads visit and supervise teaching in the classroom. This implies that school heads monitored the instructional delivery of their teachers to offer assistance when necessary. During the interview majority of the teachers indicated that the visit by the school heads inculcated in them the habit of preparing adequately for their classes. The monitoring of teachers' instructional delivery by school heads ties in with the findings of Malunda, Onen, Musaazi and Oonyu (2016) on instructional supervision and the pedagogical practices of secondary school teachers in Uganda which revealed that school heads supervision of lesson delivery through classroom observations has statistically significant effect on the pedagogical practices of teachers in public secondary schools in Uganda. The findings further agree with Sergiovanni and Starrat (2007) that informal and formal class visitations by principals assist teachers to assess their performance and make conscious efforts to improve same. The findings of the current study are, however, contrary to the revelation of Malunda, Onen, Musaazi and Oonyu (2016) that instructional supervision (through portfolio observation and classroom observations) was inadequately carried out and this allowed teachers to employ ineffective pedagogical practices.

The fact that school heads occasionally checked the adequacy of subject content delivered to students as found in this study is of great concern. This implies that the school heads spend very little time on ensuring adequacy of subject content delivered by teachers. This finding is contrary to that of Sekyere (2014) that school heads must ensure teachers actively involve students in lessons and adequately deliver subject content.

Lack of knowledge in particular subject specialization or enormity of the duties expected of school heads may be blamed for the non-fulfilment of this important responsibility which may negatively affect role performance of teachers' lesson delivery.

The revelation that school heads were not bothered about teachers' active involvement of students in their class is not a good development. The majority of the teachers indicated during the interview that the major concern of their school heads was teacher regularity and punctuality to class and not necessarily teachers' involvement of students in their lessons. This finding is contrary to the findings of Kalule and Bouchamma (2014) that clinical supervision by school heads have been found to enhance teachers' instructional delivery through formal classroom observation by principals in which the principals collect variety of classroom variables such as teachers' active engagement of their students in their lessons.

School Heads' Assessment Practices Supervision

Results on the practice of school heads' ensuring that continuous assessment records are kept up-to-date portrays headmasters/headmistresses' demonstration of a lot of interest and commitment to this activity. This is likely to reflect in regular assessment of students and make it easier to identify weaknesses in students' performance as well as implement corrective measures on time when the need arises. The finding further agrees with an idea expressed by the teachers during their interview. In fact, one of them said:

Teachers in my school are expected to complete students' continuous assessment records, especially termly reports at least one clear week before

school reopens for the next term. Teachers who fail to meet set deadlines are cautioned for the first offence and given queries to answer in subsequent cases. This can eventually lead to stiffer punishment such as release from the school if it persists.

The findings also concur with the findings of Alimi and Akinfolarin (2012) who studied the impact of selected models of instructional supervision activities on students' academic performance in Ondo State, Nigeria. The study established a significant impact of school heads' checking of students' notes, class exercises, moderation of examination questions and marking schemes on students' academic performance.

The school heads' discussion of students' performance with teachers could have positive influence on the teachers' lesson delivery because it will inform teachers of the specific content areas where students need further assistance. The teachers' agreement with this item corroborated the views of some school heads who were interviewed for the study. One of the school heads concurred by alluding that:

I sit on the academic board at the beginning of the term and agree on the number of assessments each teacher is supposed to conduct with his/her students. At the end of the term, we have a big forum chaired by the Assistant Head (Academic) and go through the students' performance class by class. The form master responsible reads the performance, we find out where problems are and solve them.

This view also resonates with the opinion expressed by another school head who reiterated that:

With students' assessment, I check students' records and sometimes demand for their books. Also, together with my deputies, we meet heads of department to decide on the number of exercises each teacher needs to give to their students so that I can be checking to ensure they are on course. Sometimes too when we have hints that a particular teacher is not living up to expectation, I ask the students for their exercise books and compare it with the scheme of work.

The views expressed by the teachers and school heads is in agreement with the findings of Adewale (2014) that school heads' monitoring /checking of students' notebooks/exercise books had a significant effect on academic achievement of students. The finding is also in tandem with a World Bank Report (2010) which established that school heads' monitoring of teachers' effective use of instructional time, checking of pupils' notebooks, giving enough classwork, marking assignments, writing and marking corrections enhanced students' academic performance

From the results, the school heads have shown interest and commitment to ensuring that teachers receive supervisory feedback from instructional supervisors. This is worthy of notice due to the crucial role timely feedback plays in the supervision process. It helps to identify whether their instructional delivery matches the expected standards and ultimately enhance instructional delivery if effectively carried out (Mapolisa & Tsabalala, 2013).

Opinions expressed by the teachers during the interview session showed that the school heads' direct supervision to teachers contributed to teachers' role performance. The teachers indicated that regular supervision of their lesson planning and delivery activities as well as supervision of assessment practices by the school heads instills in teachers, the habit of preparing adequately before teaching and make them feel their contribution to the school is appreciated.

The results of the multiple regression and views expressed by teachers during the interview concurs with the findings of Wanzare's (2011) study which found that direct supervision practices of school heads in Kenyan public secondary schools, through monitoring teachers' instructional work, improved quality of teachers and teaching. This finding is further supported by the study of Panigrahi (2012) on implementation of instructional supervision in Ethiopian secondary schools. The study found regular classroom visitation by school heads provided opportunity for headteachers to interact with teachers to know what exactly goes on in the classroom and ensured teachers performed instructional delivery activities as expected. The study by Panigrahi (2012) also established that feedback offered by school heads, helped teachers to rectify anomalies in their instructional delivery process and high standards in their role performance. In the Ghanaian context, the findings imply that effective lesson planning and lesson delivery supervision by school heads is likely to enhance teacher role performance and improve students' academic performance in public senior high schools.

Limitations

One of the limitations of the study was the geographical location. The Cape Coast metropolis and the Abura Asebu Kwamankesse district constitute only two out of the twenty-three metropolitan/municipal and districts that form part of the population. Secondly, the study sample was small compared to the total population of students in the region. Caution should therefore be exercised in generalizing the findings to the population. Again, the use of multiple regression for analysis of the quantitative data fell short of finding out other statistical implications of the findings such as effect size, confidence interval and determination of spuriousity.

Recommendations

Based on the findings, the study recommends that:

1. School heads should reduce the teaching load of HoDs to enable them play more instrumental roles in the instructional supervision component of the school heads' administrative responsibilities
2. School heads must commit more time and resources to lesson planning and lesson delivery supervision since they were found to have significant effect on teacher role performance in senior high schools
3. The Ghana Education Service must dedicate a greater portion of the promotion requirements of the school heads to evidence of direct supervision of teachers
4. School heads must insist on teachers' active involvement of students in their instructional delivery activities. School heads must organize periodic in-service training for teachers on various delivery strategies that can be beneficial to their students.

5. The Ghana Education Service (GES) must ensure the inclusion of group supervisory approaches for teachers in the official instructional supervision policy for senior high schools, to augment the supervision provided by the school heads.

Conclusion

The primary focus of this study was to examine the influence of school heads direct supervision on teachers' role performance in selected public senior high schools in Ghana. There is dearth of studies and limited empirical findings on instructional supervision at the secondary education level in Ghana. Findings from the study revealed that school heads poorly supervised lesson preparation by teachers. Thus, instructional documents such as lesson plans/notes and schemes of work were hardly inspected and school heads failed to discuss and give suggestions to their teachers for improvement. This was mainly due to inadequate time allocated to this activity by school heads. However, the study found that school heads moderately supervised teachers lesson by ensuring teachers' punctuality, effective use of instructional time and delivery of lessons in accordance with prepared lesson plans/notes. The study established that school heads periodically discussed academic performance of students with teachers on regular basis through departmental and general staff meetings and made sure continuous assessment records of students were regularly updated. The study therefore concludes that effective school heads' direct supervision will enhance teachers' role performance in Ghanaian senior high schools. All the necessary resources must be provided for the heads to adequately execute this important administrative function.

References

- Adewale, O. S. (2014). The positive effect of selected technique of instructional supervision on students' academic achievement in secondary schools/high schools. *International Journal of Humanities and Social Science Invention*, 3(1), 22–26.
- Adu, E.O., Akinloye, G. M., & Olaoye, O.F. (2014) Internal and external school supervision: Issues, challenges and way forward. *International Journal of Educational Sciences*, 7(2), 269–278, <https://doi.org/10.1080/09751122.2014.11890189>
- Afolabi, F. O. & Loto, A. B. (2008). The headmasters and quality control in primary education through effective intra school supervision in Nigeria. *Journal of Teachers Perspective*, 3(2), 4–25.
- Alemayehu, G. O. (2008). *The current practices and problems of subject-area instructional supervision in secondary schools of Addis Ababa City Administration* (Unpublished master's thesis). Addis Ababa University, Addis Ababa.
- Alimi, O. S. and Akinfolarin, C. A. (2012). Impact of selected modes of instructional supervision activities on students' academic performance in senior secondary schools in Ondo state, Nigeria. *Education Research Journal*. 2(1), 1–6.
- Amin, M., E. (2005). *Social Science research: Conception, methodology, and analysis*. Kampala: Makerere University.
- Ampofo, S. Y., Bizimana, B., Mbuti, J., Ndayambaje, I., & Orodho, J.A. (2014). Performance discrepancies between formative and summative assessments: Focus on six different higher learning institutions from Ghana, Kenya and Rwanda. *International Journal of Recent Scientific Research*, 5(7), 1386–1393.
- Arong, F. E., & Ogbadu, M. A. (2010). Major causes of declining quality of education in Nigeria administrative perspective: A case study of Dekina Local Government Area. *Canadian Social Science*, 6(3), 61–76. <https://doi.org/10.3968/j.css.1923669720100603.021>
- Asafo- Adjaye, P. (2012). Private returns on education in Ghana: Estimating the effects of education on employability in Ghana. *African Sociological Review*, 16(1), 121–139.
- Asiyai, R. I. (2009). Effect of clinical supervision of instruction on teacher performance of tasks. *Benin Journal of Education Studies*, 19(1&2), 238–248.
- Beinomugisha, P., Kamyia, E, & Said, B. (2014). Ability to deliver and advancement of women in academic and administrative positions in public universities in Central Uganda. *Educational Research International*, 3(2), 36–44.
- Bertalanffy, L. V. (1968). *General systems theory; Foundations, development and applications*. New York: George Braziller Inc.
- Creswell, J.W. (2014). *Research design: Qualitative, quantitative and mixed methods approaches* (4th Ed). Thousand Oaks, California: Sage Publications.
- Creswell, J. W., & Clark, V. L. P. (2011). *Designing and conducting mixed methods research* (2nd ed.). Thousand Oaks, CA: Sage.
- Dickson, A. (2011). *The state of supervision of teaching and learning in public junior high schools in Ghana: A case study of selected junior high schools in Sekyere East*

- District of Ashanti Region.* (Unpublished doctoral thesis), Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.
- Ekyaw, B. A. (2014). The practices and challenges of instructional supervision in Asossa Zone primary schools. (Unpublished doctoral thesis), Jimma University, Ethiopia.
- Enaigbe, P.A. (2009). Strategies for improving supervisory skills for effective primary education in Nigeria. *Edo Journal of Counselling*, 2(2), 235–244.
<https://doi.org/10.4314/ejc.v2i2.60864>
- Gakuya, N. J. (2013). *Influence of headteachers' instructional supervision practices on students' performance in Mathematics in public secondary schools in Nyandarua South District, Kenya.* (Unpublished doctoral thesis), University of Nairobi, Nairobi.
- Ghana Education Service. (2015). *Metropolitan annual performance reports on education for Cape Coast.* Ghana: Ministry of Education.
- Glanz, J., Shulman, V., & Sullivan, S. (2007, April). *Impact of instructional supervision on student achievement: Can we make a connection?* Paper presented at the Annual Conference of the American Educational Research Association. Chicago, CA.
- Glickman, C. D., Gordon, P. S., & Ross-Gordon, J. M. (2009). *The basic guide to supervision and instructional leadership* (2nd Ed). Boston: Pearson Education Inc.
- Jenlink, P. M., Reigeluth, C. M., Carr, A. A & Nelson, L. M. (1996). An expedition for change: Facilitating the systemic change process in school districts. *Tech Trends*, 41(1), 21–30. <https://doi.org/10.1007/BF02812078>
- Joshua, M. T., Ekanem, J. O., & Agborbechem, P. T. (2007). Assessment of professional roles performance of mathematics teachers in Nigeria. Paper presented at episteme Conference.
- Kalule, L. & Bouchamma, Y. (2014). Teacher supervision practices and characteristics of in-school supervisors in Uganda. *Educational Assessment, Evaluation and Accountability*, 26, 51–71. <https://doi.org/10.1007/s11092-013-9181-y>
- Kothari, C. R. (2013). *Research methodology, methods and techniques, (2nd Revised Edition).* New Delhi: New Age International Publishers, New Delhi.
- Kibuuka, M. Kiweewa, E., Nakate, S. & Kizza, S. S. (2013). Small-scale entrepreneurs' success in Kampala capital authority, Uganda. *The Academic Journal of the School of Graduate Studies*, 4(1), 1–16.
- Kutsyuruba, B. (2003). *Instructional supervision: Perceptions of Canadian and Ukrainian beginning high-school teachers* (Unpublished masters thesis). University of Saskatchewan: Saskatoon.
- Malunda, P., Onen, D, Musaaazi, J C. S., & Oonyu, J. (2016). Instructional supervision and the pedagogical practices of secondary school teachers in Uganda. *Journal of Education and Practice*, 7(30), 117–187.
- Mankoe, J. O. (2007). *Educational administration and management in Ghana* (2nd ed.). Kumasi: Payless Publication Limited.
- Mapolisa, T. & Tshabalala, T. (2013). Instructional supervisory practices of Zimbabwean school heads. *Greener Journal of Education Research*, 3(7), 354–362.

- Mofareh, A. (2011). *School-based instructional supervision in Saudi Arabian public secondary schools*, (Unpublished doctoral thesis), University of York, York.
- Onwuegbuzie, A. J. (2012). Introduction: Putting the mixed back into quantitative and qualitative research in educational research and beyond: Moving towards the radical middle. *International Journal of Multiple Research Approaches*, 6(3), 192–219. <https://doi.org/10.5172/mra.2012.6.3.192>
- Osakwe, R. (2010). The relationship between principals' supervisory strategies and teachers' instructional performance in Delta North Senatorial District, Nigeria. *Pakistan Journal of Social Sciences*, 7(6), 437–440. <https://doi.org/10.3923/pjssci.2010.437.440>
- Osei-Mensah, F. (2012). *Factors that influence the performance in general knowledge in Art of senior high school students in Abura Asebu Kwamankese district in the Central Region*, (Unpublished masters thesis), University of Nairobi, Nairobi.
- Panigrahi, M. R. (2012). Implementation of instructional supervision in secondary school: approaches, prospects and problems. *Science, Technology and Arts Research Journal*, 1(3): 59–67.
- Sergiovanni, T. J., and Starratt, R. J. (2007). *Supervision: A redefinition* (8th ed.). New York: McGraw-Hill Companies Inc.
- Sekyere, E. A. (2014). *Teachers' guide on topical issues for promotion and selection interviews for teachers and non-teaching staff and general professional update*. Kumasi: Afosek Educational Consult.
- Stark, D., McGhee, M. W., & Jimerson, J. B. (2017). Reclaiming instructional supervision: Using solution-focused strategies to promote teacher development. *Journal of Research on Leadership Education*. 12(3), 215–238. <https://doi.org/10.1177/1942775116684895>
- Sullivan, S., & Glanz, J. (2013). *Supervision that improves teaching and learning: Strategies and techniques* (4th ed.). Thousand Oaks, CA: SAGE.
- Sullivan, S. & Glanz, J. (2005). *Supervision That Improves Teaching* (2nd ed.). USA. Corwin Press.
- Too, C., Kimutai, C. K., & Kosgei, Z. (2012). The impact of head teachers' supervision of teachers on students' academic performance. *Journal of Emerging Trends in Educational Research and Policy Studies*, 3(3), 299–306.
- Tyagi, R. S. (2010). School-based instructional supervision and the effective professional development of teachers. *Compare: A Journal of Comparative and International Education*, 40(1), 111–125. <https://doi.org/10.1080/03057920902909485>
- Wanzare, Z. (2011). Instructional supervision in public secondary schools in Kenya. *Educational Management Administration and Leadership*, 40(2), 188–216. <https://doi.org/10.1177/1741143211427977>
- World Bank. (2010). *Supervision and support of primary and secondary education: A policy note for the Government of Poland*. Retrieved from <http://documents.worldbank.org/curated/en/425821468093563823/pdf/687220ESW0P1130y0Education0V0Final.pdf>.

Corresponding author: Samuel Ampofo

Contact email: sampofo@ucc.edu.gh

**Faculty Target-Based Engagement Assessment Statistical Model for Enhancing
Performance and Education Quality**

Mohamed Askar
Southern Utah University, USA

Abstract

There is a worldwide interest in developing quantitative faculty members' activity evaluation models. However, implementing a fair and reliable model is challenging. Without capable and high-quality faculty members, no education improvement effort subsequently can succeed. Based on the gap analysis of the literature, lack of a quantitative faculty member assessment model might affect teaching and scholarly performance and lead to undesirable effects. Therefore, most of the existing metrics assessment models do not capture the full range of activities that support and transmit knowledge to students.

The main objective of the current research is to develop a practical, comprehensive and flexible statistical Target-Based Engagement assessment model of faculty members that considers both the specific faculty needs and the academic unit management concerns. A mathematical relationship between one or more random and additional non-random variables was used to develop the model. Descriptive and inferential statistical methods were applied in the data analysis. The Target-Based Engagement model has seven interconnected aspects and three subsequent modules. It is a robust statistical framework for automatic faculty assessment.

The results of this model are beneficial for faculty assessment in addition to having well-aligned key performance indicators inside the different levels of the institution. The model helps in supporting different strategic decision-making of the institution and is considered as a long-term improvement method in the academic profession. Creating a vision for future faculty assessment statistical models will improve the faculty performance and enhance the performance of all higher education stakeholders.

Keywords: target-based engagement, statistical model, quality of engineering education, self-assessment, faculty member assessment

Faculty evaluation is a complex process that encompasses various interconnected activities and actions, all of which are related to a specific purpose. Furthermore, it plays a vital role in education and helping faculty identify areas of strength and weakness in their educational skills. Without capable and high-quality faculty members, no education improvement effort subsequently can succeed. Hence, without high-quality evaluation systems, enhancing faculty members' performance cannot proceed.

A few studies attempt to evaluate the overall activity of academic staff. Based on the gap analysis of the literature, lack of quantitative faculty member assessment models might affect teaching and scholarly performance and lead to undesirable effects. Therefore, most of the existing metrics assessment models do not capture the full range of activities that support and transmit knowledge to students. Significant flaws in both substance and process are present in most of them (Elmore, 2008).

Higher Education institutions are facing the challenge of enhancing the quality of academics. They are usually using student teaching evaluation surveys as a tool to assess the quality of education. These surveys can afford useful information to the management about insights on their strengths and weaknesses, but evaluating faculty performance requires different parameters in different criteria to forecast the performance. Using faculty performance assessment criteria such as teaching and instruction standards, scholarly activity standards, community service standards and exceptional development standards will lead to better efficiency and accuracy.

A quantitative assessment of faculty performance aims to identify strengths and weaknesses in order to provide acceptable professional education enhancement. Accordingly, there are numerous important challenges in developing a comprehensive and supportive faculty member evaluation model. The model should:

- be based on methodologically sound procedures;
- be capable of reflecting differences between academic faculty;
- take into account the university/department strategic plans;
- help to enhance the performance of faculty members;
- be applicable to all faculty members; and
- be appropriate as a metric for continuous improvement, promotion and incentives.

Literature Review

There is a worldwide interest in developing quantitative faculty member's activity evaluation models (Mitchell & Leachman, 2015). However, implementing a fair and reliable model is challenging. Evaluation of faculty member performance plays an essential role in engineering education, helping faculty identify areas of strength and weakness in their educational skills. Lately, numerous state governments of the United States have obviously reduced the investment in public education (Mitchell & Leachman, 2015), and some states have acknowledged performance-based distribution to improve state universities regarding faculty development (Dougherty & Natow, 2015; Ellis & Bowden, 2014; Miao, 2012; O'Shaughnessy, 2013; Umbricht, Fernandez, & Ortagus, 2017). Numerous US public universities exposed to performance-based financing are currently getting reduced funding from their state legislatures. Some universities are increasingly having to self-fund some of their programs by raising tuition, focusing on funding research, and requiring some service fees from their students (Hillman, Tandberg, & Fryer, 2015). In such cases, the burden of searching for additional funds to support university programs is carried by the university administrators (chancellors, provosts, deans and

chairs) (Agbetsiafa, 2010). Accordingly, applying diverse techniques for evaluating the quality of education and faculty members is highly desired.

In reference to the survey data analysis gathered from more than 2,000 American college administrators, the National Institute for Learning Outcomes Assessment 2009 report (Kuh & Ikenberry, 2009) specifies that faculty engagement is an essential challenge for the assessment task at higher education institutions. The reason for this engagement is to determine and inspect empirically the factors that affect faculty members' engagement in learning outcomes-based assessment. Particularly, it is expected to investigate personal internal factors (e.g., values, perceptions, attitudes and knowledge) and external factors (e.g., institutional culture, policies and resources) on their commitment and actual involvement in assessment. As researchers state that “little is known about faculty and students’ attitudes regarding different aspects of assessment that have wide-ranging implications for policy and practice in tertiary institutions” (Fletcher, Meyer, Anderson, Johnston, & Rees, 2012, p.119), the conclusions from this faculty Target Based Engagement (TBE) model will provide a much needed statistical conceptual framework about faculty's engagement in assessment to develop a quantitative means for measuring the performance of faculty members. A review of the literature (Banta and Associates., 2002; Grunwald & Peterson, 2003; Havnes & McDowell, 2008; Maki, 2010; and Palomba & Banta, 2015) discloses investigations of factors that impact faculty members' engagement in assessment activities, such as (a) time condition; (b) workload; (c) absence of assessment knowledge and resources; (d) uncertainty about the requirement of assessment; (e) concern of connecting assessment outcomes with faculty evaluation; and (f) fear of assessment intervening academic self-determination. However, most of the discussions rely on subjective methods.

Outstanding faculty members are playing the primary role in the assurance and improvement of teaching and research quality. To support the faculty member assessment system, the university administration has to provide faculty by methodology and application where used evaluation models with a scientific background. There are numerous existing different evaluation models for faculty members. The most known models include the Objective model, the Four levels of the evaluation model, the CIPP model, Provus's Discrepancy model, the CIRO model, and the Goal-free evaluation model (Stufflebeam, 2003).

Nowadays, data is at the center of researchers' work, regardless of whether they deal with science, industry or education (Chang, Kaufmann, & Kwan, 2014; Provost & Fawcett, 2013). The availability of such data makes it essential for them to be analyzed and evaluated adequately, which clarifies the current development of a new field named data science (Hardin et al., 2015; Emmert-Streib, Moutari, & Dehmer, 2016; Emmert-Streib & Dehmer, 2019; Dehmer & Emmet-Streib, 2017). For the analysis of faculty evaluation models, such as regression or classification methods (Emmert-Streib & Dehmer, 2019), permitting to estimate a forecast faculty model selection and model assessment are the main concepts for finding the best model for a given data set. Interestingly, concerning the description of the best model, there are two opposite approaches with a different fundamental philosophy (Ding, Tarokh, & Yang, 2018; Forster, 2000). One is defining the best model as predictiveness of a model, and the other as descriptiveness. The latter approach aims at identifying the accurate model, whose interpretation leads to a deeper understanding of the generated data and the underlying processes that created the data.

Regardless of the importance of all these model concepts, there are insufficient literature reviews available on the intermediate level that frame the objectives and approaches of faculty model selection and model assessment in a limited means. For illustration, innovative literature reviews

presented by Ding et al. (2018), Arlot and Celisse (2010) and Wit, van der Heuvel, and Romeijn (2012) are comprehensive presentations without much detail. Moreover, there are basic outlines to some models, such as by Aho, Derryberry, and Peterson (2014) and Zucchini (2000). These models focus only on a minor subsection of the main concepts, making it difficult to distinguish the broader image of faculty model selection and model assessment.

In addition to the above evaluation models, there are several existing theoretical models for the evaluation of teaching performance presented by Apodaca and Grad (2005), Chen and Hoshower (2003), Mittal and Gera (2013), Seidel and Shavelson (2007), and Scheerens and Bosker (1997). Apodaca and Grad argued for the theory of teaching effectiveness from a student learning methodology, in particular, the learning theory. Chen Hoshower applied the expectancy theory, initially advanced by Vroom, in their exploration of faculty members and student evaluation of teaching. Mittal and Gera included in their research the teaching effectiveness and charisma features on student evaluation of teaching effectiveness in higher education. Seidel and Shavelson and Scheerens and Bosker reviewed a few faculty effectiveness models that focused on teaching progression elements and process product models, which positively influenced student learning aftermaths.

In contrast, the focus of this paper is different in the following ways. First, the general conceptual ideas behind the model development, model assessment and their interconnections are presented. For this, theoretical details are accessible as far as they are helpful for a deeper understanding. Second, practical methods for the engagement of the faculty and the strategic objectives of the department/university are available as examples of the model inputs. It allows closing the gap between theoretical understanding and unbiased, practical assessment application. Third, the clarifications aim at an intermediate level of the reader by providing related information commonly omitted in advanced texts and forms that should ensure the paper benefits for a wide-ranging distribution with an overall interest in data science. Finally, some information about the practical application and validation of the model by using the MatLab R2019a statistical programming are existing. MatLab is used in the statistical assessment because it is a widely used program, which is freely available and forms the gold standard of the literature on statistics.

Research Paradigm and Hypothesis

This paper does not describe the findings of the research study in detail, but rather, it is representing the design, development, and potential application of the new faculty assessment model. Consequently, the application gives lesser importance as compared to the model development due to implementation time limitation that requires collecting data for five years. Based on the gap analysis of the literature, the study focuses more on model design innovation and concept orientation and does not necessarily require detailed theoretical or experimental development and analysis.

Hypotheses to be considered when structuring this faculty evaluation model include:

- How to design a model indicating the strategic objectives of the department/university and useful for enhancing faculty performance?
- How to define a clear set of evaluation criteria projecting, in the various areas of academic activity, stakeholders' values and concerns about academic careers and institutional policies?
- How to describe, as objectively and explicitly as possible, the performance of each one of the criteria, considering integrating its quantitative and qualitative dimensions?

Purpose of the Research

The primary purpose of the research is to develop a Target-Based Engagement (TBE) assessment statistical model of faculty members for enhancing the performance and quality of education. On the one hand, faculty evaluation has a formative purpose that the results are used to help faculty development, self-improvement and growth. Moreover, faculty evaluation has a summative purpose that the results are used to make personnel decisions on faculty promotion and incentives. Secondary objectives are to assess:

- Faculty teaching performance with improved specificity of feedback and alignment of assessments with the students' assessment survey.
- Faculty self-awareness of their skill level to guide them in targeted teaching skill acquisition and improvement.
- Institutional teaching competency considering self-evaluations and learner assessment data are combined to guide programming for faculty development.

Research Methodology

Conceptual Framework of Target-Based Engagement Statistical Model

Figure 1 provides the TBE statistical model conceptual framework summarizing the aspects involved and the way they interconnect. The main objective is to assure that faculty evaluation contributes to the improvement of the education quality and student outcomes through enhanced teaching performance and practice. The framework has seven interconnected aspects.

Persons assessed: Who? Faculty member evaluation is to be analyzed as the vital part of an evaluation and assessment framework of the TBE statistical model, which includes other components such as program/department assessment, teaching/scholarly/service/creativity assessment, continuous learning evaluation, strengths and weaknesses review, training needs analysis and strategic plan updating.

Aspects assessed: Which? The model measures the performance of the faculty's contribution each year that declared in the Faculty Improvement Plan (FIP). The FIP is synchronized with the Department's Strategic Plan (DSP). A target variable was constructed based on the engagement of the faculty in selecting the appropriate target activities from the original numeric department's Activity Performance Standard Database (APSD) during a specific period. The APSD has four distinct criteria, as shown in Tables 1-4: teaching and instruction standards, scholarly activity standards, community service standards, and exceptional development standards. All criterion items are prepared by faculty in his/her Faculty Improvement Plan and will be compared later with the actual achievements. The institution has minimum yearly required points per faculty, based on its strategic plan. Each criterion item has a different nature of contribution determined by the institution and based on the degree of importance in the strategic plan. It is classified as excellent, superior and good.

Furthermore, each criterion is classified into three value categories –superior, excellent, and good with different activities worth as follows (Table 5):

1. Each activity in the superior category is worth 3-point values,
2. Each activity in the excellent category is worth 2-point values, and
3. Each activity in the good category is worth a 1-point value.

Evaluation technology: How? This aspect refers to the methodology and procedures of a given approach to faculty evaluation, which is the mix of tools and criteria and standards used in the TBE faculty evaluation model. Faculty evaluation may be based on a combination of tools such as self-evaluation, classroom observation, department evaluation, performance indicators, satisfaction surveys, and external evaluation. It is undertaken concerning criteria and standards for the teaching profession, such as students learning outcomes, references, and performance. A statistical analysis model was used for faculty evaluation by applying MatLab.

Capabilities to evaluate and use response: By whom? This aspect concerns the arrangement to assess, to be evaluated and to use the results of the evaluation. It includes evaluators, such as faculty, peers, department chair, students and mentors to perform the assessment; and users for feedback, such as faculty, institution leaders, administrators, policymakers, etc.

Agents involved: With whom? This aspect generally deals with the application aspects of both faculty and institution evaluation procedures. Thus, it relates to the participation of a range of stakeholders such as students, faculty, institution leaders, educational administrators, policymakers, parents, communities, unions and education professionals.

Aspects gained: What? The main benefits of implementing this model are described in three criteria groups: faculty assessment, institution evaluation and strategic/decision-making.

Purposes: For what? It includes the objectives of the TBE evaluation model and the mechanisms designed to assure that the evaluation results are used in a way such goals are reached. Moreover, the purposes of a faculty evaluation model typically consist of improvement and accountability. Examples of mechanisms to use evaluation results feedback include performance feedback, professional development plans, financial and other rewards, Information/Publication of results and Policy adjustments/development.

Algorithm of Target-Based Engagement Statistical Model

The research set out to develop a TBE assessment model of faculty members. The algorithm of the TBE statistical analysis module consists of the following modules (Figure 2):

1. Model Inputs: Faculty Member Activity Plan

1.1. Category Level:

Equation (1) represents an example of the planned assessment points of a superior category (teaching standards criterion) that worth 3-points per activity.

$$\text{Teaching Superior Category Planned Points} = \sum_{i=1}^n 3.TSi \quad (1)$$

Where;

T_{Si} = Teaching superior category planned activities ($T_{S1}, T_{S2}, \dots, T_{Sn}$),

3 = Worth points for each activity included in the superior category, and

n = Number of selected activities

Equation (2) represents an example of the planned assessment points of an excellent category (scholarly activity standards criterion) that worth 2-points.

$$\text{Scholarly Excellent Category Planned Points} = \sum_{j=1}^n 2.SEj \quad (2)$$

Where;

S_{Ej} = Scholarly excellent category planned activities ($S_{E1}, S_{E2}, \dots, S_{En}$),

2 = Worth points for each activity included in the excellent category, and
 n = Number of selected activities

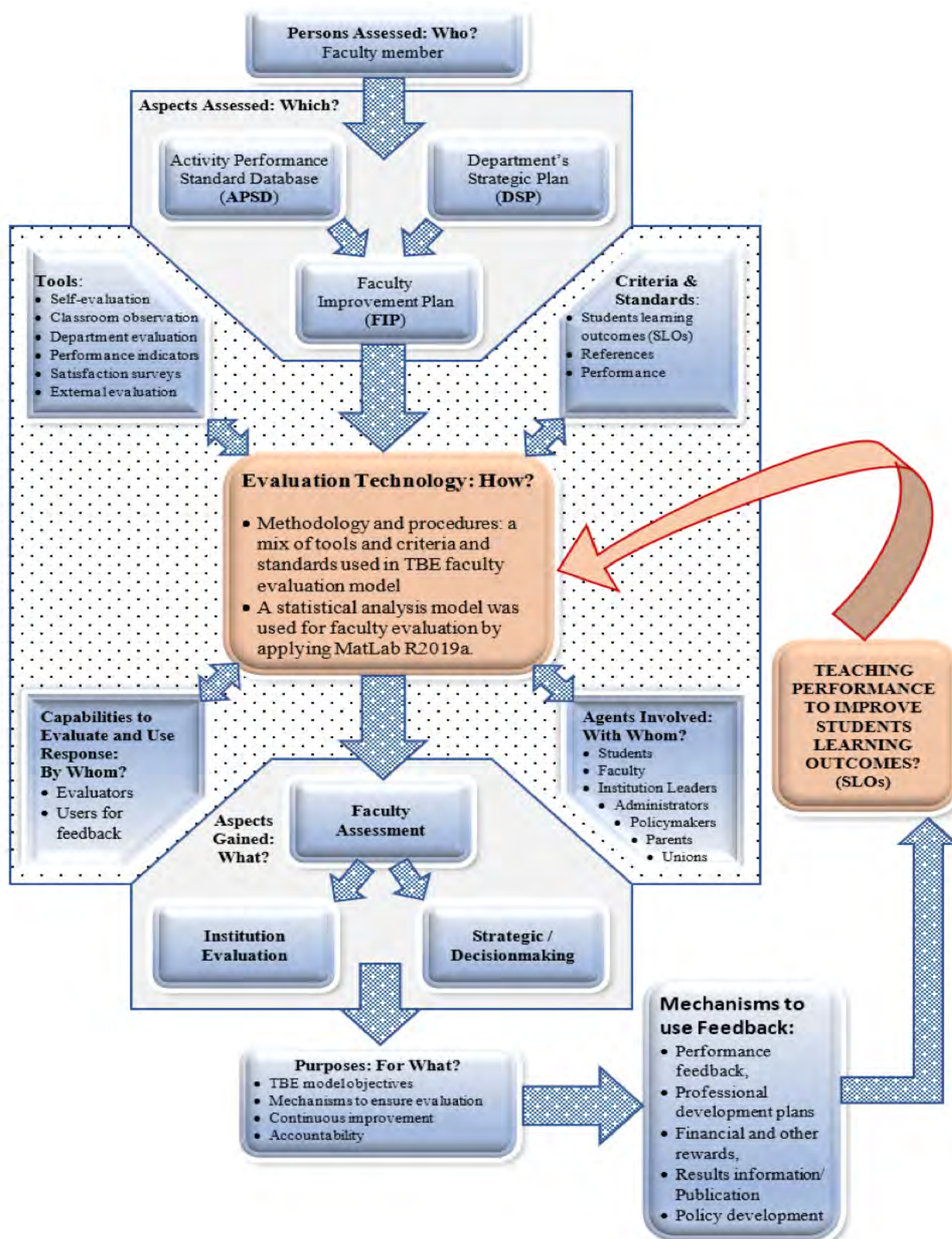


Figure 1: The Conceptual Framework for TBE Faculty Evaluation Model

Table 1: Faculty teaching activities plan

Engineering & Technology Dept.		Faculty Activities Plan					Faculty Name: ABC		
Plan Activities		Proposed Plan		Actual Achievement			Final Adjusted Points	Assessment Progress, %	
		Activities	Points	Activities	Points	Quality			
1. Teaching (Superior Performance = 18 Points, Excellent performance = 14 Points, Good Performance = 10, Unacceptable Performance = 4)									
1.A. Superior Value (3 points) "Direct Evaluation"		15.00					10.20	68%	
1.A.1	Review teaching evaluations based on department standard and implement a research-based change (required each year)	1	3.00	1	3.00	75%	2.25	75%	
1.A.2	Attend a half-day CETL workshop and implement a research-based teaching change	1	3.00	1	3.00	90%	2.70	90%	
1.A.3	Attend a CETL teaching circle that meets multiple days and implement a research-based change	1	3.00	1	3.00	85%	2.55	85%	
1.A.4	Complete a significant formative assessment of student learning and implement a research-based change	1	3.00		-		-	0%	
1.A.5	New preparation for a three-hour course	1	3.00	1	3.00	90%	2.70	90%	
1.A.6	Teaching Effectiveness and ability		-		-		-	0%	
1.A.7	Course visiting/observations of classroom presentation, teaching style and instructional methods and tools		-		-		-	0%	
1.A.8	Syllabi, course objectives, course scope, depth and sequence of course material		-		-		-	0%	
1.A.9	Teaching and examination methodology, material and using Canvas		-		-		-	0%	
1.A.10	Student Learning Outcomes		-		-		-	0%	
1.B. Excellent Value (2 points) "Reports" at least 1 / semester		4.00					3.40	85%	
1.B.1	Professional Knowledge - understanding curriculum, subject content, and student needs		-		-		-	0%	
1.B.2	Instructional Planning - using SUU curricula and standards, effective strategies, and resources, to address student needs	1	2.00	1	2.00	90%	1.80	90%	
1.B.3	Instructional Strategies - engaging students in active learning to facilitate the students' acquisition of vital knowledge and skills		-		-		-	0%	
1.B.4	Differentiated Instruction - challenging student's learning by providing appropriate content which addresses individual learning differences	1	2.00	1	2.00	80%	1.60	80%	
1.B.5	Assessment Strategies - choosing a variety of diagnostic, formative, and summative assessment strategies that are valid and appropriate for the content		-		-		-	0%	
1.B.6	Assessment Uses - measuring student progress, to inform instructional content and delivery methods		-		-		-	0%	
1.B.7	Positive Learning Environment - providing a well-managed, safe, and orderly environment that is conducive to learning		-		-		-	0%	
1.B.8	Academically Challenging Environment - creating a student-centered, academic environment in which teaching and learning occur at high levels and students are self-directed learners		-		-		-	0%	
1.B.9	Professionalism - exhibiting a commitment to professional ethics and the department's mission and participating in professional growth opportunities to support student learning		-		-		-	0%	
1.B.10	Other report/activity deemed (by the Department Chair) to be of similar caliber		-		-		-	0%	
1.C. Good Value (1 point) "Any other Pieces of evidence"		2.00					2.00	100%	
1.C.1	Attend a half-day CETL workshop without implementing a change		-		-		-	0%	
1.C.2	Mentor a senior design group		-		-		-	0%	
1.C.3	Review one teaching-related conference or journal paper	1	1.00	1	1.00	100%	1.00	100%	
1.C.4	Assess the impact of a continuous improvement item using an appropriate methodology		-		-		-	0%	
1.C.5	Evidence of creation of an organized learning environment (syllabi, course outlines, learning objectives, study guides, etc.)	1	1.00	1	1.00	100%	1.00	100%	
1.C.6	Evidence of creative, thoughtful and thorough methods and materials (electronic media, unique field experiences, lab experiences, classroom activities, projects, etc.)		-		-		-	0%	
1.C.7	Evidence of seeking and receiving feedback from students and others about teaching performance (student scores and comments, peer evaluations of classroom and/or materials)		-		-		-	0%	
1.C.8	Evidence of thoughtful reflection about the feedback (analysis of quantitative and qualitative data, summary, overviews, etc.)		-		-		-	0%	
1.C.9	Evidence of adjustments made (comments about what worked and didn't work and thoughts of why)		-		-		-	0%	
1.C.10	Other evidence/activity deemed (by the Department Chair) to be of similar caliber		-		-		-	0%	
Sub-Total (Teaching)			21.00				15.60	74%	

Table 2: Faculty scholarly activities plan

Engineering & Technology Dept.		Faculty Activities Plan					Faculty Name: ABC	
Plan Activities		Proposed Plan		Actual Achievement			Final Adjusted Points	Assessment Progress, %
		Activities	Points	Activities	Points	Quality		
2. Scholarly (Superior Performance = 12 Points, Excellent Performance = 9 Points, Good Performance = 5, Unacceptable Performance = 2)								
2.A. Superior Value (3 points)			12.00				5.55	46%
2.A.1	Publication in peer-reviewed venues (conference proceedings or journals)	1	3.00	1	3.00	100%	3.00	100%
2.A.2	Formal collaborative undergraduate research (faculty-student) that will result in dissemination		-		-		-	0%
2.A.3	Publication of a book or commercial lab manual	1	3.00		-		-	0%
2.A.4	Present an online short course in connection with a conference by invitation or request	1	3.00	1	3.00	85%	2.55	85%
2.A.5	Conducting a workshop or formal training for SUU faculties and staff		-		-		-	0%
2.A.6	Participation in projects that result in a Funded External Grant over \$40,000 (Principal or Co-Principal Writer) OR Director of a multi-year project involving over \$100,000 in funding		-		-		-	0%
2.A.7	Implementation results of faculty/student scholarly projects or activities		-		-		-	0%
2.A.8	Formal review of a college/department program by request	1	3.00		-		-	0%
2.A.9	Pedagogical research or work in a successful ABET accreditation (Principal Writer)		-		-		-	0%
2.A.10	Develop a course that results in distribution (presenting it at a conference, for example)		-		-		-	0%
2.B. Excellent Value (2 points)			4.00				1.80	45%
2.B.1	Poster or oral presentation at scholarly/professional venue		-		-		-	0%
2.B.2	Work with students who present a poster/ paper at professional meetings		-		-		-	0%
2.B.3	Publication of a book chapter or section		-		-		-	0%
2.B.4	On-line workshop or presentation		-		-		-	0%
2.B.5	Presentation at a national or international professional event or conference		-		-		-	0%
2.B.6	Participation in projects that result in a Funded External Grant over \$20,000.00-\$39,000 (Principal or Co-Principal Writer) OR Director of the multi-year project involving \$40,000-\$99,999 in funding		-		-		-	0%
2.B.7	Engaging in scholarly activity that gives rise to the improvement or development of curriculum	1	2.00		-		-	0%
2.B.8	Referee an article in an online venue or journal OR review a text or lab manual by request of the publisher		-		-		-	0%
2.B.9	Contributor for national accreditation or accreditation review		-		-		-	0%
2.B.10	Reviewing, creating, investigating, or applying software applications in new ways	1	2.00	1	2.00	90%	1.80	90%
2.C. Good Value (1 point)			1.00				0.75	75%
2.C.1	Published article in a non-refereed journal or other print or electronic medium		-		-		-	0%
2.C.2	Work with students who present a poster/paper at a non-refereed journal or other print or electronic medium		-		-		-	0%
2.C.3	Book review for the publishing company	1	1.00	1	1.00	75%	0.75	75%
2.C.4	On-line related-venue		-		-		-	0%
2.C.5	Conducting a formal training or workshop OR serving as a guest lecturer in a colleague's class		-		-		-	0%
2.C.6	Professional consultation report which is submitted in writing to a client that has local impact OR Co-PI of multi-year funded grant (\$40,000-\$99,999)		-		-		-	0%
2.C.7	Be nominated for a scholarly award		-		-		-	0%
2.C.8	Review an article or five abstracts in a journal, conference or online venue		-		-		-	0%
2.C.9	Develop pedagogy that results in dissemination (presenting at a conference, CARAT, etc.)		-		-		-	0%
2.C.10	Developing assessment criteria, methods or materials		-		-		-	0%
Sub-Total (Teaching)			17.00				8.10	48%

Table 3: Faculty service activities plan

Engineering & Technology Dept.		Faculty Activities Plan					Faculty Name: ABC	
Plan Activities		Proposed Plan		Actual Achievement			Final Adjusted Points	Assessment Progress, %
		Activities	Points	Activities	Points	Quality		
3. Service (Superior Performance = 10 Points, Excellent Performance = 6 Points, Good Performance = 3, Unacceptable Performance = 1)								
3.A. Superior Value (3 points)		6.00					5.55	93%
3.A.1	Chairing any Departmental, College, or University committee		-		-		-	0%
3.A.2	Serving on any hiring committee		-		-		-	0%
3.A.3	Working as Engineering Club advisor [due to the planning time commitment]	1	3.00	1	3.00	85%	2.55	85%
3.A.4	Working in an official position for a regional or national professional society, or a state entity (such as USHE or USOE)		-		-		-	0%
3.A.5	Accompanying students to regional, national or international conferences where students' original or collaborative work is presented		-		-		-	0%
3.A.6	Serving on the Faculty Senate		-		-		-	0%
3.A.7	Working on an LRT Committee (at any level)	1	3.00	1	3.00	100%	3.00	100%
3.A.8	Other achievements /activities deemed by the Department Chair to be of similar caliber		-		-		-	0%
3.B. Excellent Value (2 points)		2.00					2.00	100%
3.B.1	Serving on the Provost's Retention Committee		-		-		-	0%
3.B.2	Working on the College Recruitment and Retention Committee		-		-		-	0%
3.B.3	Working on the Departmental Recruitment and Retention Committee		-		-		-	0%
3.B.4	Serving on the Department Curriculum Committee	1	2.00	1	2.00	100%	2.00	100%
3.B.5	Serving on the Undergraduate Research Committee		-		-		-	0%
3.B.6	Working as a course coordinator for a Departmental course		-		-		-	0%
3.B.7	Service in the SUU community (including other committees)		-		-		-	0%
3.B.8	Service as a supervisor of an organization or student club		-		-		-	0%
3.B.9	Other achievements/activities deemed by the Department Chair to be of similar caliber		-		-		-	0%
3.C. Good Value (1 point)		2.00					1.75	88%
3.C.1	Membership in a professional organization (ASEE, AIAA, ASCE, ASME, ASM, ASTM, IEEE, etc.)		-		-		-	0%
3.C.2	Be designated for a service award or other professional recognition		-		-		-	0%
3.C.3	Work as a supervisor of a group preparing for a non-technical competition	1	1.00	1	1.00	75%	0.75	75%
3.C.4	Engineering-related service in the non-SUU community		-		-		-	0%
3.C.5	Serving as a Science Fair judge		-		-		-	0%
3.C.6	Serving on the University Finance Committee		-		-		-	0%
3.C.7	Serving on the University Honors Committee	1	1.00	1	1.00	100%	1.00	100%
3.C.8	Other achievements/activities deemed by the Department Chair to be of similar caliber		-		-		-	0%
Sub-Total (Service)			10.00				9.30	93%

Table 4: Faculty exceptional development activities plan

Engineering & Technology Dept.		Faculty Activities Plan					Faculty Name: ABC	
Plan Activities		Proposed Plan		Actual Achievement			Final Adjusted Points	Assessment Progress, %
		Activities	Points	Activities	Points	Quality		
4. Exceptional Development (Superior Performance = 10 Points, Excellent Performance = 6 Points, Good Performance = 3, Unacceptable Performance = 1)								
4.A. Superior Value (3 points)		6.00					5.25	88%
4.A.1	External or university awards, honors or other recognition for intellectual contributions		-		-		-	0%
4.A.2	Processes used for and the development of the existing program; such as Canvas	1	3.00	1	3.00	100%	3.00	100%
4.A.3	Leading the process of setting, monitoring and achieving specific and challenging goals or strategies that reflect high expectations		-		-		-	0%
4.A.4	Leading an implemented departmental program/workshop shows the vision of continuous improvement	1	3.00	1	3.00	75%	2.25	75%
4.A.5	Building any data-tracking systems		-		-		-	0%
4.A.6	Leading a project that represents department improvement; such as (Strategic Plan)		-		-		-	0%
4.A.7	Service to professional organizations or publishing applicable papers, studies or projects to support the profession		-		-		-	0%
4.A.8	Leading a leadership team		-		-		-	0%
4.A.9	Leading a staff development program; such as the leader of an enhancing mechanism		-		-		-	0%
4.A.10	Other activities/achievements deemed by the Department Chair to be of similar caliber		-		-		-	0%
4.B. Excellent Value (2 points)		4.00					1.50	38%
4.B.1	Participating in an implemented departmental program/workshop shows the vision of continuous improvement		-		-		-	0%
4.B.2	Participating in a project that represents department improvement; such as (Strategic Plan)		-		-		-	0%
4.B.3	Participating in a leadership team		-		-		-	0%
4.B.4	Participating in a staff development program; such as a member of an enhancing mechanism	1	2.00	1	2.00	75%	1.50	75%
4.B.5	Sharing in analysis and revision of curriculum, instruction, assessments and allocation of resources to ensure alignment of courses with SUU standards		-		-		-	0%
4.B.6	Build group conversations– topics and agendas		-		-		-	0%
4.B.7	Sharing in analysis work of measuring Value-Added to students at the end of any semester	1	2.00		-		-	0%
4.B.8	Participating in any lessons learning workshops		-		-		-	0%
4.B.9	Sharing in activities related to a shared vision of continuous improvement		-		-		-	0%
4.B.10	Other activities/achievements deemed by the Department Chair to be of similar caliber		-		-		-	0%
4.C. Good Value (1 point)		2.00					0.75	38%
4.C.1	Professional development for self and staff – notes, agendas, minutes		-		-		-	0%
4.C.2	Any documentation processes for the department activities to be used later in any continuous development work		-		-		-	0%
4.C.3	Scheduling site visits from education associations or industry (at least 2/year)	1	1.00	1	1.00	75%	0.75	75%
4.C.4	Allocate resources, including technology, to assist student and staff learning		-		-		-	0%
4.C.5	Create a collaborative learning culture		-		-		-	0%
4.C.6	Staff meeting observations for problem-solving		-		-		-	0%
4.C.7	Following-up department meeting minutes		-		-		-	0%
4.C.8	Booster club information	1	1.00		-		-	0%
4.C.9	Following-up programs that allow alumni to return and give back		-		-		-	0%
4.C.10	Other activities/achievements deemed by the Department Chair to be of similar caliber		-		-		-	0%
Sub-Total (Creativity)			12.00				7.50	63%
Total Assessment, based on Faculty Plan			60.00				40.50	68%
Total Assessment, based on Required			50.00				40.50	81%

Table 5: Relative weights of the department’s activity performance standard database module

Assessment Category	Superior		Excellent		Good	
	Score	%age	Score	%age	Score	%age
Teaching	18	36%	14	39%	10	48%
Scholarly	12	24%	9	25%	5	24%
Service	10	20%	6	17%	3	14%
Exceptional Development	10	20%	7	19%	3	14%
Total	50	100%	36	100%	21	100%

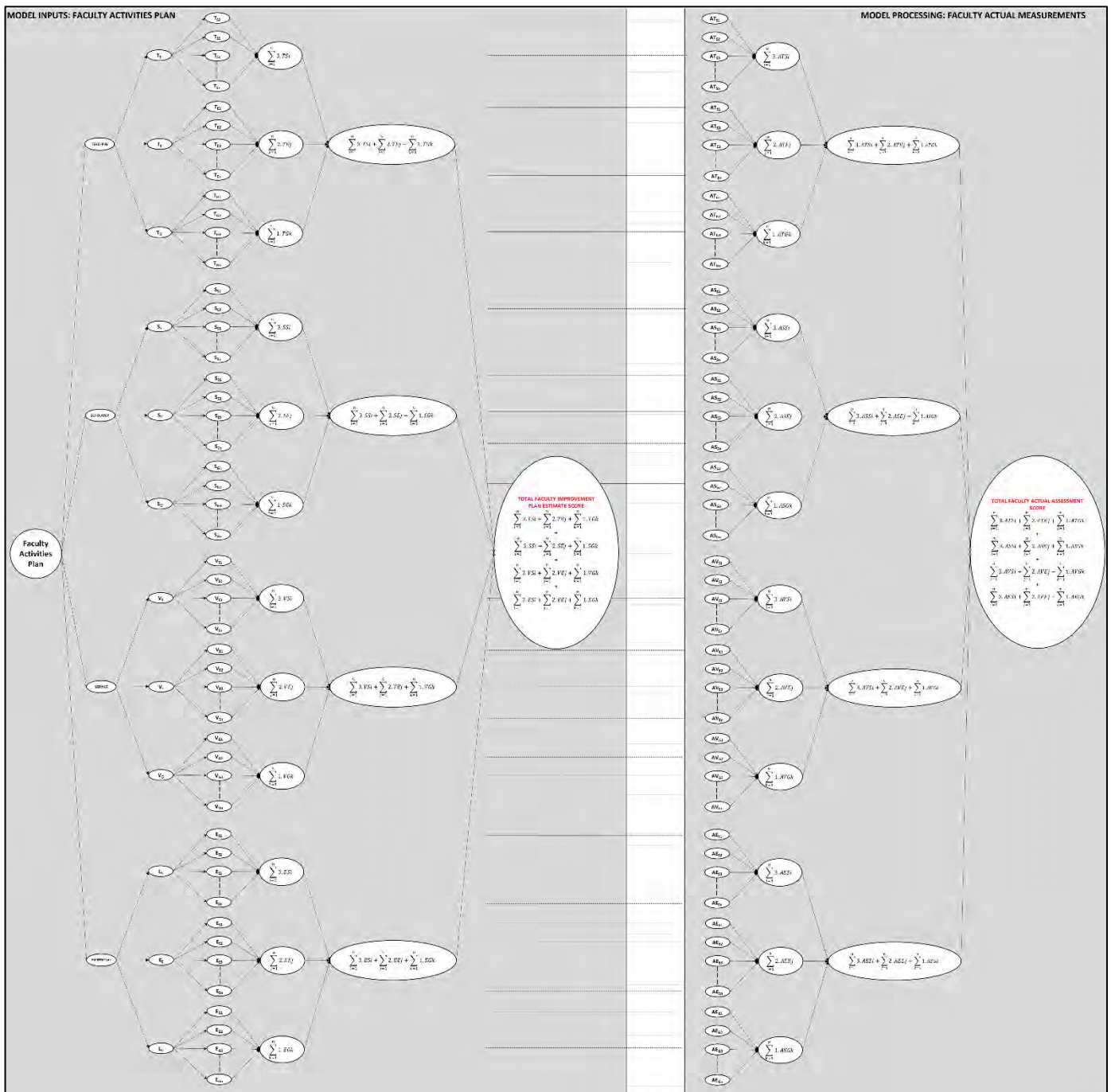


Figure 2: Engagement assessment statistical model of faculty members

Equation (3) represents an example of the planned assessment points of a good category (service activity standards criterion) that worth 1-point per activity.

$$\text{Service Good Category Planned Points} = \sum_{k=1}^n 1.VGk \quad (3)$$

Where;

V_{Gk} = Service good category planned activities ($V_{G1}, V_{G2}, \dots, V_{Gn}$),

1 = Worth points for each activity included in the good category, and

n = Number of selected activities

1.2. Criteria Level:

Equation (4) represents an example of the planned assessment points of a criteria level (case of teaching activity standards criterion).

$$\text{Teaching Planned Points} = \sum_{i=1}^n 3.TSi + \sum_{j=1}^n 2.TEj + \sum_{k=1}^n 1.TGk \quad (4)$$

Where;

T_{Si} = Teaching superior category planned activities ($T_{S1}, T_{S2}, \dots, T_{Sn}$),

T_{Ej} = Teaching excellent category Planned Activities ($T_{E1}, T_{E2}, \dots, T_{En}$),

T_{Gk} = Teaching good category planned activities ($T_{G1}, T_{G2}, \dots, T_{Gn}$),

3 = Worth points for each activity included in the superior category,

2 = Worth points for each activity included in the excellent category,

1 = Worth points for each activity included in the good category, and

n = Number of selected activities

1.3. Faculty Improvement Plan Level:

Equation (5) represents the total planned assessment points of the faculty member improvement plan.

$$\begin{aligned} \text{Total Planned Points} = & \sum_{i=1}^n 3.TSi + \sum_{j=1}^n 2.TEj + \sum_{k=1}^n 1.TGk + \\ & \sum_{i=1}^n 3.SSi + \sum_{j=1}^n 2.SEj + \sum_{k=1}^n 1.SGk + \\ & \sum_{i=1}^n 3.VSi + \sum_{j=1}^n 2.VEj + \sum_{k=1}^n 1.VGk + \\ & \sum_{i=1}^n 3.ESi + \sum_{j=1}^n 2.EEj + \sum_{k=1}^n 1.EGk \end{aligned} \quad (5)$$

2. Model Processing: Faculty Member Actual Measurements

The statistical model was used to represent, frequently in the significantly idealized form, the data-generating process. The model was specified as a mathematical relationship between one or more random variables and additional non-random variables. Two main statistical methods were used in the data analysis: descriptive statistics, which summarized data from a sample using indices such as the mean or standard deviation, and inferential statistics, which concluded from the data that were subject to random variation. The actual points of the yearly FIP were compared with the planned ones to create a score by using the above formulas. The value categories were automatically

awarded and calculated for all different levels of the university, department, and faculty by using MatLab R2019a. The model calculates the total faculty actual performance in three levels:

2.1. Category Level.

2.2. Criteria Level.

2.3. Faculty Improvement Plan Level:

Equation (6) represents the total actual assessment points of the faculty member.

$$\begin{aligned}
 \text{Total Actual Points} = & \sum_{i=1}^n 3. \text{ATSi} + \sum_{j=1}^n 2. \text{ATEj} + \sum_{k=1}^n 1. \text{ATGk} + \\
 & \sum_{i=1}^n 3. \text{ASSi} + \sum_{j=1}^n 2. \text{ASEj} + \sum_{k=1}^n 1. \text{ASGk} + \\
 & \sum_{i=1}^n 3. \text{AVSi} + \sum_{j=1}^n 2. \text{AVEj} + \sum_{k=1}^n 1. \text{AVGk} + \\
 & \sum_{i=1}^n 3. \text{AESi} + \sum_{j=1}^n 2. \text{AEEj} + \sum_{k=1}^n 1. \text{AEGk} \quad (6)
 \end{aligned}$$

3. Model Outputs: Statistical Analysis of Faculty Assessment

The TBE model outputs were figured based on the statistical experiments that can be summarized in the following:

1. Direct outputs: Dashboard of faculty performance indicators (Figures 3-14). They are those outputs that calculated and developed directly in the model.
2. Indirect Outputs: Dashboard of the institution's performance and strategic decision-making indicators. They are outputs that need more processing and calculation to figure out the indicators.

TBE Analysis and Implementation

The TBE model is a robust statistical framework for automatic faculty assessment. It is a simplified, mathematically-formalized way and optionally to make predictions from this approximation to analyze the performance measurements and help in the institutional development decision-making. It measures the performance of the faculty's contribution in a given year. The data were collected from the faculty activity development plan in the Engineering and Technology Department at Southern Utah University in the year of 2018-2019. For ethical consideration and confidentiality, all collected data were without compromising the identities of their respondents.

Table (1) shows that the total proposed faculty teaching activities plan was 21.00 points, while the final adjusted points were 15.60, with achievement progress of 74%. Table (2) shows that the total proposed faculty scholarly activities plan was 17.00 points, while the final adjusted points were 8.10, with achievement progress of 48%. Table (3) shows that the total proposed faculty service activities plan was 10.00 points, while the final adjusted points were 9.30, with achievement progress of 93%. Table (4) shows that the total proposed faculty exceptional development activities plan was 12.00 points, while the final adjusted points were 7.50, with achievement progress of 63%. The total assessment was 60 points, based on the proposed plan, while the total final adjusted points were 40.50, with total achievement progress of 68%. The

total assessment was 50 points, based on the required achievements from the institution, while the total final adjusted points were 40.50, with total achievement progress of 81%.

Based on the institution's strategic plan, table (5) shows that the model teaching score designed for 'superior' as 18, 'excellent' as 14, and 'good' as 10. The model scholarly score designed for 'superior' as 12, 'excellent' as 9, and 'good' as 5. The model service score designed for 'superior' as 10, 'excellent' as 6, and 'good' is 3. The model exceptional development score designed for 'superior' as 10, 'excellent' as 7, and 'good' as 3.

The engagement of the faculty in achieving the activity performance of the institution was given emphasis on all the Tables from 1-4, while the engagement of the institution was given emphasis on table 5 and the minimum yearly required points per faculty. The evaluation conducted focused on both the engagement of each faculty and the required achievement of the institution's target plans.

Figure (3) shows the different rates of performance assessment for each criterion. They vary in teaching and instruction standards from 36% to 48%, scholarly activity standards from 24% to 25%, community service standards from 24% to 25%, and exceptional development standards from 14% to 20%. Figures from (4-7) show the yearly faculty plan assessment for each category (superior, excellent and good) and the total average assessment. The highest evaluation of the faculty was in community service standards, while the lowest one was in scholarly activity standards. Figure (8) shows the yearly faculty plan total Assessment for each criterion and the total average assessment. Figures (9-123) show the annual faculty member's qualitative and quantitative performance per each category and criterion (overall faculty average was 68%). The quantitative performance represents the faculty member degree of commitment, which reflects the FIP achievement degree (faculty average is 78%), while the qualitative performance represents the faculty member's degree of excellence, which reflects the work quality degree (faculty average is 87%), as calculated in Tables 1-4. Figure (13) shows the total yearly faculty member's qualitative and quantitative performance. Figure (14) shows the faculty member's continuous development in 5-years per each criterion and category.

Implementing the TBE Model equations will help the quality dimensions of the institutional higher education as follows:

Faculty Members

From the analysis of the model, faculty evaluation has a formative purpose that the results are used to help faculty development, self-improvement and growth, and personnel decisions on promotion and incentives.

Teaching Quality

From the statistical analysis module, faculty teaching performance will be improved specificity of feedback and alignment of assessments with the students' assessment survey. As mentioned in the activities plan of teaching and scholarly, faculty take advantage of the new technological tools to enhance student-to-faculty interaction and to better assess student progress. They connect with advanced teaching practices to improve their teaching materials and methods. Faculty take the opportunity to reflect on their own actions and role in the enhancement of teaching quality, obtaining a commitment to reflective practice and causing adaptation and innovation.



Figure 3: Rates of performance assessment

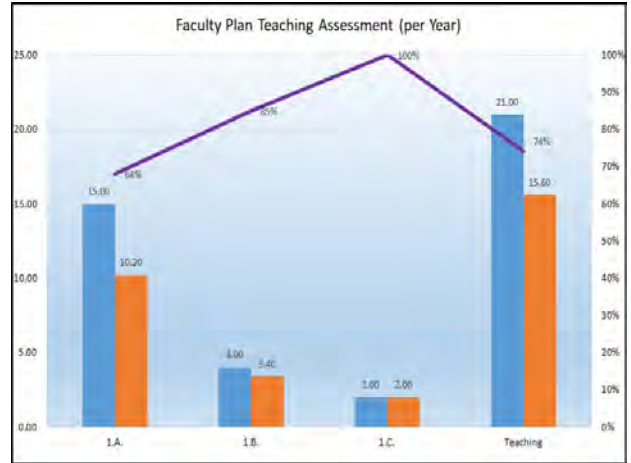


Figure 4: Faculty plan teaching assessment (per year)

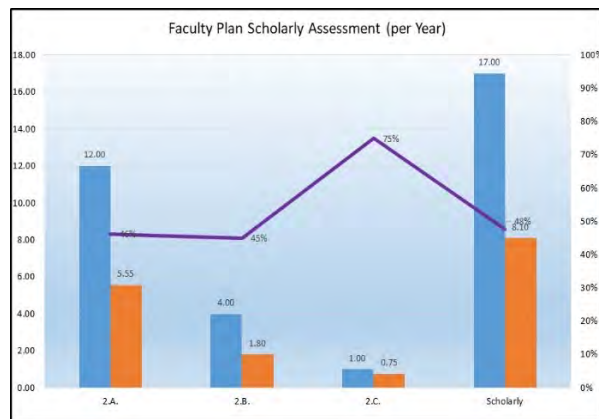


Figure 5: Faculty plan scholarly assessment (per year)

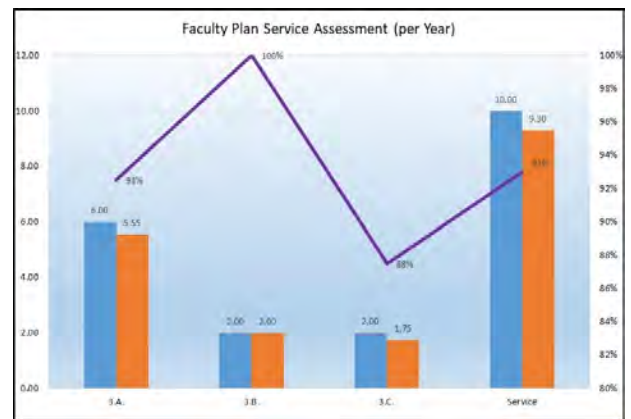


Figure 6: Faculty plan service assessment (per year)

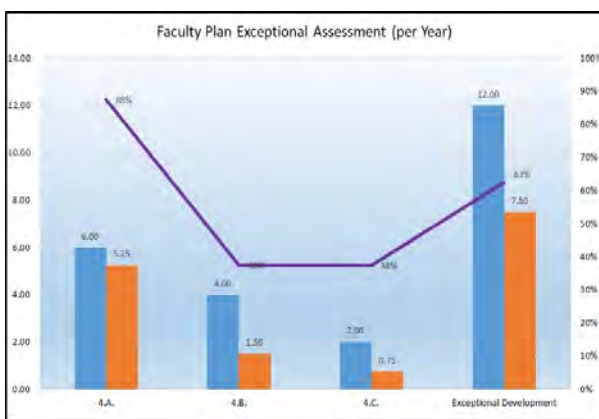


Figure 7: Faculty plan exceptional assessment (per year)

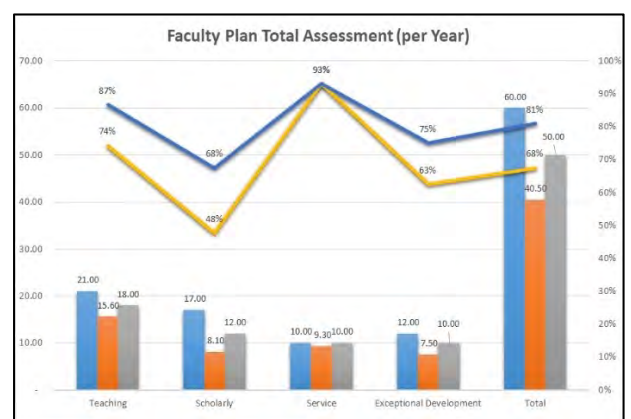


Figure 8: Faculty plan total assessment (per year)

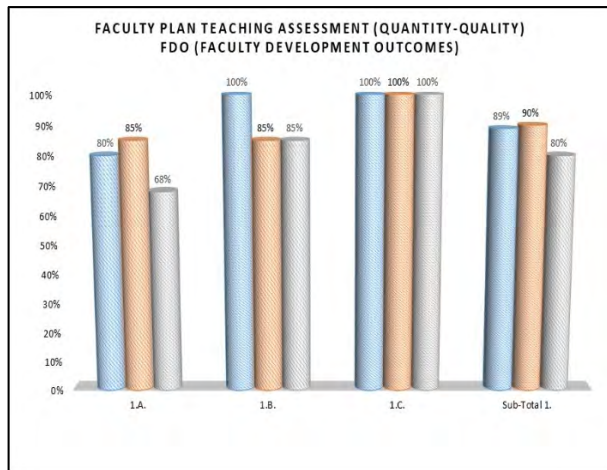


Figure 9: Faculty plan teaching assessment (quantity-quality)



Figure 10: Faculty plan scholarly assessment (quantity-quality)

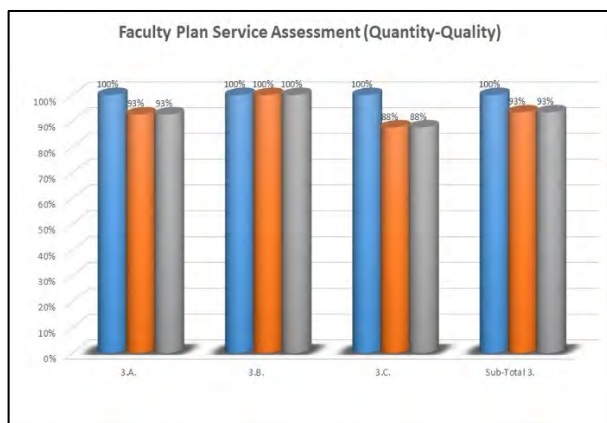


Figure 11: Faculty plan service assessment (quantity-quality)

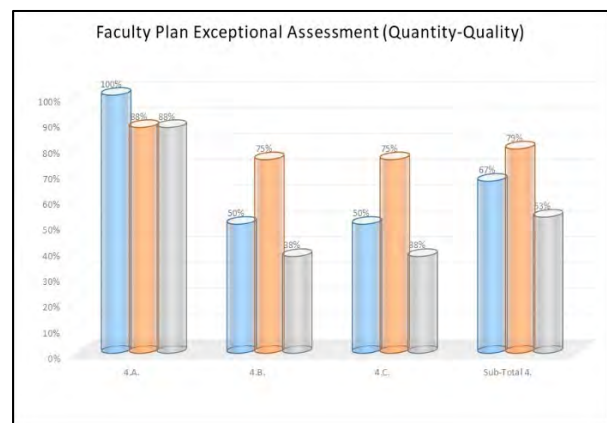


Figure 12: Faculty plan exceptional assessment (quantity-quality)

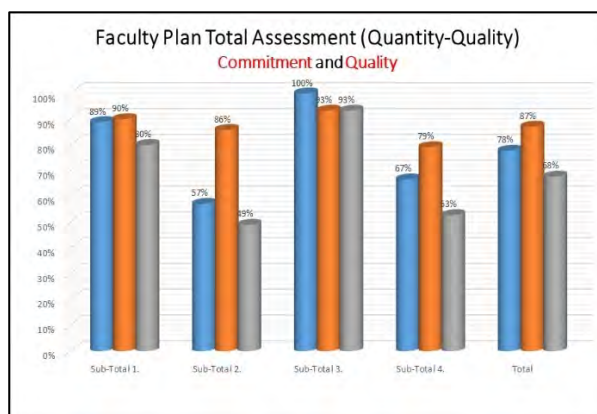


Figure 13: Faculty plan total assessment (quantity-quality)



Figure 14: Faculty plan development chart in 5-Years (just for verification)

Teaching Competency Criteria

In addition to the faculty evaluation criteria by comparing equations (5) and (6), the model helps in having well-aligned information inside the different levels of the institution (university, department and faculty). The institutional teaching competency considering self-evaluations and learner assessment data are combined to guide programming for faculty development, which will help to improve the higher education performance in figuring out the following different criteria:

- Average program/department assessment
- Assessment comparison of all programs
- Average assessment for all department
- Top 5-faculty in the program/department
- Best program in the department
- Faculty/program/department continuous learning over time
- Institution development outcomes progress over time
- Average teaching/scholarly/service/creativity assessment per program/department
- Average teaching/scholarly/service/creativity continuous learning over time per program/department

Institution Strategic Decision-Making

Over the above, the model helps in supporting the following strategic decision-making of the institution:

- Strengths and weaknesses of program/department
- Faculty training needs analysis
- Institution strategic plan updating
- Faculty workload matrix
- Potentials for improvement plans
- Faculty promotion plans
- Building mechanisms to support faculty
- Continuous improvement quality circles

Students

Applying the TBE Model will help the students to collaborate actively with faculty in the definition of the initiative and of the quality of the teaching concept itself. The model will assist in keeping the interaction active and increasing concerns about teaching, learning environments, quality of content and faculty attitudes.

Conclusions

There is a worldwide interest in developing quantitative faculty member's activity evaluation models (Mitchell & Leachman, 2015). However, implementing a fair and reliable model is challenging. There are numerous existing different evaluation models for faculty members. The main objective of the current research is to propose a practical, comprehensive and flexible statistical Target-Based Engagement (TBE) assessment model of faculty members. The model considers both the specific faculty needs through selecting the matching activities in the faculty member's plan and the academic unit management concerns through providing a list of activities' references compatible with the unit strategic plan. The model involves several sequential phases and has a significant impact on enhancing faculty performance and institutional quality. The TBE model processing reliability was developed in the Department of Engineering and Technology at Southern Utah University. The statistical model helps improving faculty

performance and is considered a long-term improvement method in the academic profession. The consequences of this model will enhance the performance of higher education stakeholders.

The main components of TBE are:

1. Department strategic plan.
2. Department's Activity Performance Standard Database (APSD) classified into four main criteria: teaching and instruction standards, scholarly activity standards, community service standards, and exceptional development standards. Each criterion has three value categories (superior, excellent and good) with different activities worth.
3. Measurement Module (MM) that includes different methods for evaluating the faculty member's performance from various sources, such as department chair, self-assessment, students, peers, mentors, etc.
4. Faculty Improvement Plan (FIP) coordinated with the department's strategic plan.
5. Statistical Analysis Module (SAM) that automatically calculates all different levels of the university, department, and faculty by using MatLab R2019a.

Recommendations

The current research focuses on the determination of the reliability and validity of the suggested TBE model. Based on the gap analysis of the literature, the model does not describe the findings of the research study in detail, but rather it is representing the model design innovation, development, concept orientation and potential application of a new faculty assessment model. The application gives lesser importance as compared to the model development due to the implementation time limitation that requires collecting data for five years to establish the whole list of the statistical analysis aspects that the model could provide. In this paper, the implementation of the model was based on one year of collected data. Subsequent studies must include a more extended implementation period in order to determine the generalizability of the model.

References

- Agbetsiafa, D. (2010). Evaluating effective teaching in college-level economics using student ratings of instruction: A factor analytic approach. *Journal of College Teaching & Learning*, 7(5), 57–66. <https://doi.org/10.19030/tlc.v7i5.7841>
- Aho, K., Derryberry, D., & Peterson, T. (2014). Model selection for ecologists: The worldviews of AIC and BIC. *Ecology*, 95, 631–636. <https://doi.org/10.1890/13-1452.1>
- Apodaca, P., & Grad, H. (2005). The dimensionality of student ratings of teaching – Integration of uni-and multidimensional models. *Studies in Higher Education*, 30(6), 723–748. <https://doi.org/10.1080/03075070500340101>
- Arlot, S., & Celisse, A. (2010). A survey of cross-validation procedures for the model selection. *Statist. Surv.* 4, 40–79. <https://doi.org/10.1214/09-SS054>
- Banta, T. W., & Associates. (2002). Building a scholarship for assessment. San Francisco, CA: Jossey-Bass Publishers.
- Chang, R. M., Kauffman, J., & Kwon, Y. (2014). Understanding the paradigm shift to computational social science in the presence of big data. *Decision Support Systems*. 63, 67–80. <https://doi.org/10.1016/j.dss.2013.08.008>
- Chen, Y., & Hoshower, L. B. (2003). Student evaluation of teaching effectiveness – An assessment of student perception and motivation. *Assessment & Evaluation in Higher Education*, 28(1), 71–88. <https://doi.org/10.1080/02602930301683>
- Dehmer, M. & Emmert-Streib, F. (2017). *Frontiers Data Science; CRC Press: Boca Raton. FL, USA.*
- Ding, J., Tarokh, V. & Yang, Y. (2018). Model selection techniques: An overview. *IEEE Signal Processing Magazine* 35, 16–34.
- Dougherty, K. J., & Natow, R. S. (2015). *The performance politics funding for higher education: Origins, discontinuations, and transformations.* Baltimore, MD: JHU Press.
- Ellis, R., & Bowden, R. (2014). Performance-based funding: Changing the paradigm for higher education. *British Journal of Education, Society & Behavioral Sciences*, 4(7), 942–952. <https://doi.org/10.9734/BJESBS/2014/9236>
- Elmore, H. W. (2008). Towards Objectivity in faculty evaluation. *Academe*, 94(3): 38–40.
- Emmert-Streib, F., & Dehmer, M. (2019). Defining data science by quantification of data-driven of the community. *Machine Learning and Knowledge Extraction*, 1, 235–251. <https://doi.org/10.3390/make1010015>
- Emmert-Streib, F., & Dehmer, M. (2019). High-dimensional LASSO-based computational regression models: Regularization, shrinkage, and selection. *Machine Learning and Knowledge Extraction*, 1, 359–383. <https://doi.org/10.3390/make1010021>
- Emmert-Streib, F., Moutari, S., & Dehmer, M. (2016). The process of analyzing data is an emergent feature of data science. *Frontiers in Genetics*, 7(12). <https://doi.org/10.3389/fgene.2016.00012>
- Forster, M. R. (2000). Key concepts in model selection: Performance and generalizability. *Journal of Mathematical Psychology*, 44, 205–231. <https://doi.org/10.1006/jmps.1999.1284>

- Grunwald, H., & Peterson, M. W. (2003). Factors that promote faculty involvement in and satisfaction with institutional and classroom student assessment. *Research in Higher Education, 44*(2), 173–204. <https://doi.org/10.1023/A:1022051728874>
- Hardin, J., Hoerl, R., Horton, J., Nolan, D., Baumer, B., Hall-Holt, O., ... Ward, M. D. (2015). Data science in statistics curricula: Preparing students to "think with data". *The American Statistician, 69*, 343–353. <https://doi.org/10.1080/00031305.2015.1077729>
- Havnes, A. & McDowell, L. (2008). Introduction: Assessment dilemmas in contemporary learning cultures. In A. Haynes & L. McDowell (Eds.), *Balancing dilemmas in assessment and learning in contemporary education*, (pp. 3–14). Routledge: New York.
- Hillman, N. W., Tandberg, D. A., & Fryar, A. H. (2015). Evaluating the impacts of the "new" performance funding in higher education. *Educational Evaluation and Policy Analysis, 37*(4), 501–519. <https://doi.org/10.3102/0162373714560224>
- Fletcher, R. B., Meyer, L. H., Anderson, H., Johnston, P., & Rees, M. (2012). Faculty and students conceptions of assessment in higher education. *Higher Education, 64*, 119–133. <https://doi.org/10.1007/s10734-011-9484-1>
- Kuh, G. and Ikenberry, S. (2009). *More than you think, less than we need: Learning outcomes assessment in American higher education*. National Institute for Learning Outcomes Assessment.
- Maki, P. L. (2010). *Building a sustainable commitment across the institution: Assessing for learning* (2nd ed.). Sterling, VA: Stylus Publishing.
- Miao, K. (2012). *Performance-based funding of higher education – A detailed look at best practices in 6 states*. Washington, DC: Center for American Progress.
- Mitchell, M., & Leachman, M. (2015). *Years of cuts threaten to put the college out of reach for more students*. Washington, DC: The Center on Budget and Policy Priorities.
- Mittal, S., & Gera, R. (2013). Student evaluation of teaching effectiveness (SET): An SEM study in higher education in India. *International Journal of Business & Social Science, 4*(10), 289–298.
- O'Shaughnessy, L. (2013). *6 Challenges facing state universities*. CBSNews.
- Palomba, C. A., & Banta, T. W. (2015). *Assessment essentials: Planning, implementing and improving assessment in higher education*. San Francisco, CA: Jossey-Bass Publishers.
- Provost, F., & Fawcett, T. (2013). Data science and its relationship to big data and data-driven decision-making. *Big Data, 1*, 51–59. <https://doi.org/10.1089/big.2013.1508>
- Scheerens, J., & Bosker, R. J. (1997). *The foundations of educational effectiveness*. Oxford, UK: Pergamon.
- Seidel, T., & Shavelson, R. J. (2007). Teaching effectiveness research in the past decade - The role of theory and research design in disentangling meta-analysis results. *Review of Educational Research, 77*(4), 454–499. <https://doi.org/10.3102/0034654307310317>
- Stufflebeam, D., L. (2003). *The CIPP Model for Evaluation*. The Annual Conference of Oregon Program Evaluators Network, Portland, Oregon.
- Umbricht, M. R., Fernandez, F., & Ortagus, J. C. (2017). An examination of the (Un)intended consequences of performance funding in higher education. *Educational Policy, 31*(5), 643–673. <https://doi.org/10.1177/0895904815614398>

Wit, E., van der Heuvel, E., & Romeijn, J.W. (2012) "All models are wrong...": An introduction to model uncertainty. *Statistica Neerlandica*, 66(3), 217–236.
10.1111/j.1467-9574.2012.00530.x

Zucchini, W. (2000). An introduction to model selection. *Journal of Mathematical Psychology*, 44(1), 41–61. <https://doi.org/10.1006/jmps.1999.1276>

Corresponding author: Mohamed Askar

Contact email: mohamedaskar@suu.edu

**E-learning Self-efficacy of Operating Room Nurses of a Selected Hospital
in Cebu, Philippines**

Paul John G. Aventurado
Cebu Doctors' University, Philippines

Abstract

The conventional methods of education and training for operating room experience have been rendered impractical due to both the shortage and fast turnover of nurses in hospitals. Experts in the field of education are promoting e-learning modalities as a potential solution. However, issues were raised regarding the readiness of nurses to engage in e-learning due to lack of standardized competencies for practice, inconsistency in the integration of informatics courses in education, and lack of experts in the field. Literature reveals that self-efficacy is a major component of e-learning readiness. A descriptive-survey design was utilized to assess the e-learning self-efficacy of operating room nurses in a selected hospital in the Philippines. The Modified E-learning Readiness Assessment Tool (MERAT) captured the elements of the construct along with its sub-domains: computer, internet/online, and software utilization self-efficacy. The frequency distribution and item means were computed. Item analysis revealed that the respondents have positive e-learning self-efficacy based on item means obtained ranging from 3.29 to 4.58 on a 1.0 to 5.0 scale. A secondary analysis was conducted by clustering the e-learning self-efficacy indicators based on the nature of the competency and data trends. It revealed that the participants perceived themselves to be “Very Good” in terms of complex computer skills, online etiquette, troubleshooting computer-related issues, and usage of an e-learning platform, and “Excellent” in terms of basic computer and online skills. The results of this study implied that e-learning initiatives might be used to augment education and training of operating room nurses despite issues on manpower and competency base. It is further recommended that research explore other domains of e-learning readiness and determine the impact of this modality in the field of health care.

Keywords: e-learning, education, training, nurses, operating room, self-efficacy

Introduction

A global threat to the healthcare system is emerging as the demand for quality care increases with depleting medical resources. This scenario is exemplified with the shortage and fast turnover of nurses in hospitals, which negatively impacts the transition of knowledge and skills especially in areas that require highly technical competencies such as the operating room (Littlejohn, Campbell, Collins-McNeil, & Thembisile, 2012; Momanyi & Kaimenyi, 2015; Takase, 2010). This imbalance of supply and demand must be perceived and addressed with urgency and salience by the health sector in society. Training and education of medical practitioners have become more difficult as the context of health care becomes more demanding. The conventional preceptor-based method of education and training of nurses may not be sufficient for them to provide quality care in the face of heavy workloads, rigid schedules, and the low ratio of experienced to inexperienced personnel. The current scenario creates an opportunity for Information and Communication Technologies (ICT) and methods such as e-learning into the field of surgical training to showcase its potential and advantages. Studies have shown positive outcomes from e-learning utilization (Kadivar, Seyedfatemi, Zolfaghari, Mehran, & Hossinzade, 2016; Maertens et al., 2016), but concerns arise regarding the readiness of nurses to engage in e-learning. This stems from the lack of standardized competencies for practice, inconsistency in the integration of nursing informatics in education, and lack of experts in the field (Staggers, Gassert, & Curran, 2001). Nurses must be ready to embark on this new modality of learning as failure to do so will likely lead to the failure of e-learning initiatives (Demir & Yurdugül, 2015). E-learning readiness was conceptualized by scholars to be multifaceted with self-efficacy one of its major components.

This study assessed the e-learning self-efficacy of operating room nurses of a selected hospital in Cebu, Philippines. Findings from this study shed light on the feasibility and potential of initiating e-learning modalities in the field of nursing to augment education and training in an environment of high demands and decreased resources.

Literature Review

The nursing labor force is the front liner of the healthcare system, yet there is nursing shortage on both local and global frontiers. The dearth of healthcare providers is recognized by agencies such as the International Council of Nurses (2004) and the High Level Forum on Health Millennium Development Goals (2004) and is a cause of concern for health delivery and outcomes. Littlejohn et al. (2012) delved into the nursing shortage in the US, Philippines and South Africa and reported that this setback in manpower exists in developed and third-world countries with different contexts, but with similar adverse effects to the health care system. The nature of the nursing shortage in South Africa due to migration, limited opportunities for employment, and attrition to diseases will not be highlighted in this paper. The shortage in the United States is due to an aging workforce and lack of faculty in nursing schools. This gap in their manpower is filled up by countries like the Philippines. The country is a top exporter of nurses overseas which is primarily intended to ease labor market concerns. However, this leads to repercussions as well-trained and skilled nurses in the country leave faster than they can be replaced. Statistics in 2010 show that 85% of Filipino nurses seek work abroad. Migrating and experienced nurses leave a knowledge and skills void which is associated to the “brain drain” phenomenon in the country. The International Labor Organization (2006) conceded that most of these professionals who migrate are highly skilled and are hard to replace. The cycle continues as more nurses leave to seek better opportunities in industrialized countries with aging populations. This translates to a rapid turnover at the hospitals particularly in specialized

units like the operating room where highly specialized and technical skills are required to provide quality care. Littlejohn et al. (2012) recommended actions to address these issues in the global health force by providing better practice environments, increasing financial compensation and improved policies on recruitment and retention. However, despite a wider and comparative view of the global nursing shortage, no offer was given regarding specific measures or action plans to deal with the ongoing issues which potentially threaten the future of health care.

A fast nurse turnover at the hospitals may aggravate the current nursing shortage and loss of trained human capital (Takase, 2010; Momanyi & Kaimenyi, 2015). This perspective has turned into reality in the current setting of tertiary hospitals in the Philippines. To date, Cebu Doctors' University Hospital is serviced by less than 40 registered nurses to cover 8 operating room theaters that are utilized to provide surgical services on a 24-hour basis. Nurses newly assigned to the unit reported that they undergo preceptorship before being assigned to scrub or circulate in surgical cases. These nurses further claimed that the ratio of experienced to the novice nurses is too low to warrant good outcomes from this type of training. Heavy workloads and rigid schedules further make preceptorship impractical. This insider perspective of the hospital mirrors the report of Littlejohn et al. (2012) which described the movement of nurses from third-world countries to favor the developed ones. This renders the institution heavily disadvantaged in terms of manpower. Furthermore, poor return of investment in training and education is expected as workers are retained on a short-term basis and migrate to other settings. An alternative mode of training and education is needed to transmit knowledge and skills in the midst of low manpower, decreased time allocation for training and increased healthcare demands.

Training and education of medical practitioners have become more difficult as the context of health care becomes more demanding. The incongruence between the supply of skilled workforce and demand for quality care fast-tracked the ushering of Information and Communication Technologies (ICT) and methods such as e-learning into the field of surgical training. The conventional preceptor-based transition of knowledge and skills may not be a pragmatic method of surgical training due to rapid nurse turnover and demand for manpower. Kadivar et al. (2016) contended in their paper that nurses have high client loads and rotational shifts which make traditional education impractical; using e-learning, on the other hand, can decrease learning time by 30 to 35%. Further studies however are needed to specifically determine the value of e-learning as primary or supplemental modality of education and training. Some scholars report that this new modality may have similar effectiveness with conventional and non e-learning based interventions, but nonetheless, e-learning is at least as effective as other methods (Maertens et al., 2016).

Several scholars have appraised and recognized the value of e-learning in the field of surgical education and training. The advantages of e-learning such as accessibility, flexibility, and low-cost implementation, complement the "highly procedural" nature of surgery (Maertens et al., 2016). Competency in the surgical field involves psychomotor, cognitive and non-technical elements. Examples of technical psychomotor skills include operating room-specific proficiency in instrumentation (use or assist) and knot-tying. Cognitive elements include knowledge about the procedure or disease pattern recognition. The non-technical aspect includes generic, but important, characteristics such as communication, leadership, and professionalism. Overall, it is recognized that e-learning has the capacity to develop surgical competencies due to the mechanics of repetition, focused practice, and immediate feedback.

Maertens et al. (2016) posited that e-learning is an effective platform to develop surgical competencies. Its potential is best when combined with other modes of learning as it provides the impetus at the beginning of surgical skills development, before a degree of automaticity is achieved in clinical exposure to the operating room. The capacity to review the e-learning material also lessens the performance decay of the personnel. As an added effect, Momanyi and Kaimenyi (2015) presented from their investigation that exposing nurses to good training programs and continuing education may help decrease nurse turnover as it develops competencies and enhances morale and efficiency. These reports revealed a mechanism on how e-learning addresses manpower issues through retention of nurses. It operates on the presumption that nurses will stay longer in their line of work if they feel fulfilled in their roles as competent health care providers. In this perspective, e-learning may not be the prime mover but instead, a supplemental factor that influences deterring fast nurse turnover.

The diffusion of e-learning into the surgical training of staff can indeed help augment the impact of high nurse turnover at the hospitals. However, several authors (Oliver, 2001; Akaslan & Law, 2011; Moftakhari, 2013, as cited in Demir & Yurdugül, 2015) reiterated the need for users to be ready to engage in e-learning before embarking on this new modality. One major reason for the failure of e-learning initiatives to thrive is the lack of readiness (Demir & Yurdugül, 2015). Confidence to handle e-learning materials among nurses may not be fully developed due to lack of standardized competencies, inconsistency in the integration of Nursing Informatics (NI) in the curricula and lack of nursing experts in the field (Staggers, Gassert, & Curran, 2001). These deficiencies were highlighted and associated to e-learning readiness as it hinders the capability of nurses to fully benefit and utilize the resource. The proponent of this paper, being an educator in nursing informatics, also notes that these are valid concerns in the current educational set-up in the country.

Several healthcare leaders advocate for incorporating informatics competencies for nurses in the academe and clinical setting. However, no consensus was reached regarding the ideal informatics competencies to embody, and even local initiatives are slow to progress. Agencies such as the American Association of Colleges for Nursing (AACN), American Nurses Association (ANA), National League for Nursing (NLN) and the International Medical Informatics Association (IMIA) have published relevant papers on NI competencies but to no avail in developing a consistent list of competencies. IMIA released a set of NI competencies but these were not scientifically validated. Scholars such as Grobe (1989, as cited in Staggers, Gassert, & Curran, 2001) expressed the need for a current and validated list of NI competencies as a guiding framework for curricular development as this aids in preparing the nurses for their roles in practice and to manage expectations of potential employers and health care consumers.

Staggers et al. (2001) spearheaded a movement to create a valid and reliable set of NI competencies. It involved extracting competencies from existing literature and subjecting these for appraisal by a team of experts. A list of competencies was presented which included competencies in computer skills (data entry and access, use of email), informatics knowledge (ethical and practical use of data), and informatics skills (troubleshooting, screen layout) along four different skill levels. The most basic level, beginning nurse, has fundamental knowledge and skills in information management and computer technology. An experienced nurse is proficient in a chosen domain (education, administration) and can utilize data set and trends for productivity. An informatics specialist has advanced preparation and can use more sophisticated applications including systems development. An informatics innovator represents the highest level, and portrays one who can utilize research and generate theory in the field. There were more scholarly movements that led to the inception of other NI frameworks, but

this paper is anchored in the work of Staggers et al. (2001) as this is a pioneering empirical-based and validated model and one of the foundations of locally offered informatics courses familiar to the proponent of this paper.

Bernal, Tolentino, Gavino, Fontelo, and Marcelo (2008) discovered that nursing schools in the Philippines approach the field of NI in a superficial manner. It focuses only on basic computer skills or on applications which are expected to be basic in an environment of technological influx. The proponent's affiliated institution, as an example, offers the nursing informatics course in the bachelor's program for two semesters. The first segment of the course deals with basic computer skills such as word processing and spreadsheet application. Database concepts and applications of informatics to education, clinical care and research are given subsequently. Graduates of the program will still be far from the highest level of competency (Staggers et al., 2001) which involves capabilities to use sophisticated software, design and innovation. Nursing in the country is geared more towards delivery of health services to clients in a clinical or community setting. This is probably one reason why the Philippines is one of the highly favored exporters of nursing manpower (Littlejohn et al., 2012) as developed countries seek care providers at the bedside rather than informaticists. Other concerns in incorporating NI competencies in the country include the lack of a locally appropriate model for NI practice and a small number of experts in the field. This limits the training ground and exposure of potential nurse informaticists for developing their potential. Bernal et al. (2008) suggested the following actions to address the NI deficiencies in the country: evaluating NI models for practical application in the local arena, enhancing post graduate training, and increasing awareness for NI. The concerns relayed in literature may be reasons for poor utilization of e-learning as a means of surgical training despite its effectiveness. It is important, therefore, to assess the readiness of nurses to engage in e-learning before initiatives are started.

A state of readiness is achieved when users "believe" that they can optimize the use of e-learning platforms to attain expected outcomes. E-learning readiness is important for users to be able to optimize the use and attain benefits from online platforms. Demir and Yurdugül (2015) investigated the most comprehensive and prevalent models of e-learning readiness available in literature with the aim of developing a current and validated model. They found out that most models were developed to suit different stakeholders, including learners, teachers and institutions. Common components of these frameworks were the belief in one's competency in technology usage and confidence in prerequisite skills for e-learning. This feature of e-learning readiness is equitable to self-efficacy. The model of Hung, Chou, Chen, and Own (2010) for example presented five components including computer and internet self-efficacy. Dray, Lowenthal, Miskiewicz, Ruiz-Primo, and Marczynski (2011) named belief in technology skills as a dimension of learner self-efficacy. Smith (2005) tested the scale developed by McVay (2000) about e-learning readiness which included comfort with e-learning as one of its factors. Tubaishat and Lansari (2011) developed a scale which included the confidence and perception of e-learning among students as a dimension. Valtonen, Kukkonen, Dillon, and Vaisanen (2009) presented beliefs in online learning and ICT skills as a dimension of readiness for online learning. These are some of the models reviewed by Demir and Yurdugül (2015). There were also other prominent dimensions of e-learning readiness tackled by other scholars such as personal factors (motivation, preference, time management) and infrastructure which is not covered in this paper.

Self-efficacy research started in the 1970s, but it was not until 2008 that online self-efficacy came into focus. A major proponent of self-efficacy theory is Bandura (1997) who defined the term as the belief in one's capability to execute a task. This belief further influences a person's

choice, action, and satisfaction. Four major sources of information that determines self-efficacy include (1) performance accomplishments or inactive mastery experience which refers to validation of one's success in doing a task, (2) vicarious experience, inspiration from other people's capacity to perform the same task, (3) verbal persuasion referring to authentic feedback of achievement and (4) physiologic states as reflected by anxiety and stress involved in doing a task. The author of this paper initially was reluctant to ground this study on the theory of Bandura as the e-learning concept did not materialize yet during the early development of the self-efficacy theory. There were, however, studies which bridged the macro-level theory of Bandura to the recent concept of e-learning. A study by Lin, Liang, Yang, and Tsai (2013, as cited in Alqurashi, 2016) showed that the general concept of Bandura (1997) on self-efficacy is applicable among adult online learners. Embedding the concept of Bandura (1997) in the context of e-learning, a person with high self-efficacy has positive self-appraisal and recognizes the challenges of learning through an online environment. They seek available resources to fully utilize it and gain a sense of personal accomplishment. A person with low self-efficacy has low belief in self and will avoid engaging with the new mode of learning and deny diffusion of technology into practice. They linger on their failure and eventually disengage in e-learning.

Other studies were conducted and delved deeper into the context of self-efficacy in online learning. Alqurashi (2016) conducted a literature review of studies about online learning self-efficacy conducted between the years 1997 to 2015. Three major themes emerged as influential factors that determine online self-efficacy: (1) Computer Self-efficacy – utilization of computer and related technology, (2) Internet and Information Seeking Self-efficacy – navigation and accessing suitable information over the World Wide Web and (3) Learning Management System (LMS) Self-efficacy – interaction with the functionalities of a LMS platform. Computer self-efficacy refers to the confidence in using the computer and related technology. Alqurashi (2016) presented several studies such as those of Jan (2015), Lim (2001), Pellas (2014), Simmering (2009), and Womble (2007) which pointed out computer self-efficacy as a significant factor for e-learning. Internet and information seeking self-efficacy relates to the capability of navigating through the World Wide Web with confidence. The proponent also found several studies confirming the association between internet self-efficacy and e-learning which included those of Kuo, Walker, Schroder, & Belland, (2014), Tang and Tseng (2013), and Womble (2007). LMS self-efficacy refers to the confidence of users to utilize different functionalities of an e-learning platform such as asynchronous and synchronous communication, accessing course content and advanced tools. This component was found to have a positive impact on course performance in an online environment. This paper conceptualized e-learning self-efficacy based on these published works as the nurses' trust in their ability to succeed in e-learning through proficiency in using computer-related technology, online navigation, and platform utilization.

The mandate to incorporate e-learning competencies in the Philippine curriculum did not concretely materialize until 2012 through the Commission on Higher Education (CHED) Memorandum Order 46. With the said timeline, it is safe to say that e-learning is still in the infancy stage in the country. This supported the notion of Doculan (2016) that most research instruments on e-learning were developed for “e-mature” countries. Models that have been proposed to assess the degree of e-learning readiness such as those of Aydin and Tasci (2005), Chapnick (2000), and Watkins (2004) were not meant for developing countries. She further stated that e-learning models may not universally apply due to varying needs of stakeholders. Research tools should consider the culture, norms and infrastructure of a country. The Modified E-learning Readiness Assessment Tool (MERAT) was developed based on a Philippine study

assessing online self-efficacy. It addressed issues of compatibility and was created in the context of the local setting to capture the domain of e-learning self-efficacy of operating room nurses working in the Philippines. Furthermore, efforts were made to validate the applicability of the items on the MERAT to the Philippine setting by appraisal from authorities in the fields of computer and nursing. As it was developed within the local context, the questions on the tool cover only the first 2 levels of informatics competency presented by Staggers et al. (2001). The MERAT may not be applicable for developed countries with high-level technology use. The tool specifically included items relating to computer skills, internet, and online skills, and software application, which aligned with the conceptualization of experts previously mentioned. It was also intended to help in creating a comprehensive and sustainable e-learning strategy for the country.

Major players in education emphasized the need for incorporating e-learning into the country's school system. Some of the e-learning initiatives have gained ground and were sustained despite some limitations in infrastructure and user competencies. The University of the Philippines established the UP Open University (UPOU). The University of Santo Tomas has its own e-Learning Access Program (e-Leap). TESDA, a government agency, spearheaded the use of Moodle, an online-based course management system that allows trainers to implement e-learning programs. Arimbuyutan, Kim, Song, and So (2007) on the contrary, conceded that Filipinos are used to the traditional classroom set-up, which may slow down the transition to a new learning modality. They, however, saw potential from a large sector of Filipinos utilizing the internet and engaged in online gaming. This may lead to a promising combination of users and infrastructure. Fung (2016) further proclaimed the youths of today as "digital natives" who are familiar with computer functionalities. These users are expected to harness the potential of e-learning. The current cadre of nurses working in the hospitals falls into this generation. It remains to be seen if this innate instinct to use technology outweighs the deficiencies of the nursing educational sector. Arimbuyutan et al. (2007) implored for the advancement of e-learning in the Philippines to remain competitive in the global market. The community must address issues towards this new frontier, particularly in infrastructure, investment, pedagogy, cost, and resistance to change.

Methodology

Objective

This study sought to assess the e-learning self-efficacy of operating room nurses in a selected hospital in Cebu, Philippines.

Research Design

A descriptive survey design was used to determine the e-learning self-efficacy of the respondents of the study.

Research Environment

This study was conducted at the operating room unit of Cebu Doctors' University Hospital (CDUH). The institution is a tertiary unit hospital providing general to specialized care to different clienteles. CDUH-OR has 8 operating room theaters that cater to general and specialized surgical cases and a special unit dedicated to eye surgeries. It also has a Post

Anesthesia Care Unit (PACU) where clients are monitored after surgery. Data collection was conducted in the conference room situated inside the unit.

Research Participants

A total of 31 operating room nurses were recruited and completed the survey during March 2019. The roster of nurses was obtained from the list provided by the nursing department. Nurses who refused to participate, were on leave status during the data collection, and those with pending resignation were not included. The data collection package, which includes the informed consent form and questionnaire were printed on paper prior to data collection. The sheets were distributed and collected personally by the proponent to the respondents of the study. New nurses assigned to the unit relayed that they needed another avenue for learning as the preceptorship they undergo during the training process is not comprehensive enough to deal with more sophisticated and specialized surgical cases. The rigid schedule of nurses also makes it difficult to participate in continuing education courses. They also utilize printed and downloaded materials for additional learning.

Research Instrument

This study utilized the Modified E-learning Readiness Assessment Tool (MERAT). It is a 16-item questionnaire that assesses for self-efficacy in using the computer, navigating the internet and online environment, and utilization of software such as the Learning Management System (LMS) for e-learning. Each statement in the MERAT is matched to a 5-point Likert Scale represented by 1 (Not at all), 2 (Very Least), 3 (Little), 4 (Great) and 5 (Very Great) which refers to the respondent's confidence to perform the activity.

The items on the MERAT cover the indicators of e-learning self-efficacy as conceptualized in this study, which includes: Computer Skills, Internet/Online Skills, and Software Application Skills. Computer Skills Self-efficacy refers to the confidence in the utilization of computer and related technology. These include item numbers 1 (Knowledge on Basic Computer Function), 4 (Troubleshooting Hardware Problems), 14 (Utilization of Word Processing Software), 15 (Multitasking in Multiple Workstations) and 16 (Utilization of Spreadsheet). Internet or Online Skills Self-efficacy refer to confidence in accessing and navigation on the World Wide Web and information-seeking capabilities over the net. These include item numbers 5 (Email Attachment), 6 (Online Etiquette), 7 (Internet Navigation), 8 (Internet Browser Usage), 9 (Troubleshooting Internet Connection Problem) and 13 (File Downloading). Software Application Skills refer to the users' confidence in utilizing computer programs or applications. There are 5 items related to the utilization of the e-learning platform, including item numbers 2 (Document Access), 3 (Configuration Setting), 10 (File Search and Download), 11 (Online Library) and 12 (Asynchronous Tools).

The instrument also possessed good psychometric properties based on its administration to respondents in Luzon and Cebu, Philippines. It has a Cronbach's alpha ranging from 0.7 to 0.75.

Treatment of Data

Descriptive statistics were used to determine the e-learning self-efficacy of the respondents. An item analysis was primarily conducted using percentage and mean computation. An inductive process was made to identify patterns and clusters of indicators for a secondary

analysis of the e-learning self-efficacy. The statistical software IBM SPSS version 22 was used to process the data. Data were organized and presented through tables.

Ethics Review Process

The study protocol was submitted for initial review to Cebu Doctors' University - Institutional Ethics Review Committee (CDU-IERC) on February 20, 2019. The study qualified for expedited review under the protocol code 2019-040-Aventurado-OperatingRoom. The issuance of the CDU-IERC code signified fulfilment of the institutional requirement for mandatory registration of the research study. The paper was subjected for appraisal by a primary and secondary reviewer. The result of the first review by the panel was released February 26, 2019 with minor modifications required prior to approval. Revisions were made and the study was granted approval for implementation February 27, 2019. The CDU-IERC Final Report was accomplished by the proponent at the completion of the study and ethical clearance was secured on April 8, 2019.

The study was conducted in compliance with the prescribed institutional guidelines for ethics which specifically included the following: (1) Informed consent was obtained from the respondents which signified their understanding of the nature of the study, voluntary participation and willingness to partake the benefits from the study; (2) study protocols such as controlled room entry and appropriate spacing were strictly adhered during data collection to ensure protection of the participants' rights and integrity; and (3) data obtained from the study were collected and kept with confidentiality through removal of identifiers and using of code numbers.

Findings

Item Analysis

An item analysis of the e-learning self-efficacy of the respondents was conducted based on the Modified E-learning Readiness Assessment Tool (MERAT). Presented below are the items on the MERAT on the first column, followed by the distribution of responses according to percentage. Item mean was also computed to describe the scale and provide a basis of indicator clustering for further analysis.

Item mean interpretation was based on the following hypothetical ranges and descriptors: 4.21-5.00 (E – Excellent), 3.41-4.20 (VG – Very Good), 2.61-3.40 (Good), 1.81-2.60 (Satisfactory), 1.00-1.8 (Poor). The table below presents the item analysis of each indicator of e-learning self-efficacy among the operating room nurses of the selected institution.

Table 1: E-learning self-efficacy item analysis

Indicators	Not at all	Very least	Little	Great	Very Great	Item Mean	Intr.
1. I know the basic functions of computer hardware components (CPU, monitor) including its peripherals like printer, speaker and mouse.	0%	0%	3.2%	41.9%	54.8%	4.52	E
2. I know how to open documents in an e-learning platform.	0%	9.7%	22.6%	48.4%	19.4%	3.77	VG
3. I am comfortable in changing the configuration settings of an e-learning platform.	0%	12.9%	16.1%	58.1%	12.9%	3.71	VG
4. I know how to resolve common computer hardware or software problems or I can access technical support in case I encounter a problem.	0%	9.7%	29%	45.2%	16.1%	3.68	VG
5. I can send an email with file attachments.	0%	3.2%	3.2%	41.9%	51.6%	4.42	E
6. I am familiar with online etiquette.	0%	6.5%	22.6%	61.3%	9.7%	3.74	VG
7. I know how to surf the internet and navigate the web.	0%	0%	3.2%	38.7%	58.1%	4.55	E
8. I can use web browsers (Internet Explorer, Google Chrome) confidently.	0%	0%	3.2%	45.2%	51.6%	4.48	E
9. I know how to resolve common errors while surfing the internet like “page cannot be found” or “connection time out”.	0%	12.9%	25.8%	35.5%	25.8%	3.74	VG
10. I am comfortable with things like doing searches and downloading files in an e-learning platform.	0%	12.9%	25.8%	41.9%	19.4%	3.68	VG
11. I know how to access an online library in an e-learning platform.	0%	6.5%	25.8%	41.9%	25.8%	3.87	VG
12. I know how to use asynchronous tools in an e-learning platform like discussion boards and chat tools effectively.	0%	12.9%	19.4%	51.6%	16.1%	3.71	VG
13. I know what PDF files are and I can download and view them.	0%	0%	3.2%	48.4%	48.4%	4.45	E
14. I am comfortable with word processing and use it comfortably.	0%	0%	6.5%	29%	64.5%	4.58	E
15. I am able to open several applications at the same time and move between them.	0%	0%	6.5%	35.5%	58.1%	4.52	E
16. I know how to use spreadsheet applications.	3.2%	12.9%	41.9%	35.5%	6.5%	3.29	VG

Most of the participants' responses were positive (great or very great) among all the items of MERAT except item 16. Most of the respondents answered "great" for items 2, 3, 4, 6, 9, 10, 11, 12 and 13. Most of the respondents answered "very great" for items 1, 5, 7, 8, 13, 14 and 15. The highest item mean was computed for item number 14 which reflects utilization of word processing software, and item number 7 which depicts capability in internet navigation. The lowest item mean was obtained for item 16 which reflects spreadsheet mastery, item 4 which involves troubleshooting hardware issues and item 10 which reflects ability to search and download files. The participants obtained mean score ranges of 3.29 to 4.55, with nine out of 16 indicators interpreted as "Very Good" self-efficacy and 7 indicators rated as "Excellent" in self-efficacy.

Indicator-Clusters Analysis

The researcher analyzed the results of the item analysis and synthesized the individual indicators of e-learning self-efficacy into clusters. Clustering was done by utilizing the principle of similarity and contrast while considering the data trends within a set of indicators. For example, indicators that point to basic computer competencies may be grouped together, but may be subdivided based on the complexity or resources required to perform the skill. The different themes that emerged from clustering are presented on the table below.

Table 2: E-learning self-efficacy indicator-clusters analysis

Cluster	Description	Set of Indicators	Interpretation
A	Basic Computer Skills	Basic Computer Function, Word Processing, Spreadsheet Application	E
B	Complex Computer Skills	Troubleshooting, Spreadsheet Application	VG
C	Basic Online Skills	Email Attachment, Internet Navigation, Browser Utilization, File Downloading	E
D	Online Etiquette	Online Etiquette	VG
E	Troubleshooting	Troubleshooting: Hardware and Software, Internet Connection	VG
F	E-learning Platform	E-learning Platform: Document Access, Configuration, File Search and Download, Online Library, Asynchronous Tools	VG

The indicators relating to computer skill self-efficacy are items 1, 4, 14, 15 and 16. Participants rated items 1 (Basic Computer Function), 14 (Word Processing) and 15 (Multiple Workstations) with "Excellent" self-efficacy. These indicators are labeled as Cluster A and are considered as very basic computer skills. Cluster B are indicators related to computer skills but are more complex and not within the entry-level domain of nursing. This includes items 4 (Troubleshooting: Hardware and Software) and 16 (Spreadsheet Utilization) which obtained a rating of "Very Good" self-efficacy among the respondents.

The indicators relating to internet and online self-efficacy were items 5, 6, 7, 8, 9 and 13. Cluster C consolidated items 5 (Email Attachment), 7 (Internet Navigation), 8 (Browser Utilization) and 13 (File Downloading). These online skills are the basic ones and are part of regular internet activity which justified the "Excellent" self-efficacy rating of the respondents to these items. Item 6 was placed on a separate cluster due to its unique nature and lower rating among its counterpart. Cluster D represents online etiquette which obtained a mean item interpretation of "Very Good".

Cluster E grouped items number 4 and 9 which shares the domain of troubleshooting hardware and internet issues. The last set of indicators, Cluster F, relate to software application self-efficacy which include item 2 (Document Access), 3 (Configuration Setting), 10 (File Search and Download), 11 (Online Library) and 12 (Asynchronous Tools). Respondents rated themselves “Very Good” in terms of self-efficacy in Clusters E and F.

Clustering of the indicators based on their similarity and data trends is a preliminary step to determine the need for improvement. Grouping together similar indicators economically allowed for more specific measures to address the concern. This subsection culminates with the categorization of the indicators for e-learning self-efficacy into clusters: Cluster A (Basic Computer Skills), Cluster B (Complex Computer Skills), Cluster C (Basic Online Skills), Cluster D (Online Etiquette), Cluster E (Troubleshooting) and Cluster F (Utilization of E-learning Platform).

Discussion

The findings of this study revealed that participants have acceptable levels of e-learning self-efficacy with the majority of the indicators rated positively based on item responses and means. This contradicts the prior assumption that nurses are not prepared to engage in e-learning due to lack of standardized competencies, inconsistency in the integration of Nursing Informatics in the curricula and lack of nursing experts in the field (Staggers, Gassert, & Curran, 2001). The operating room nurses of the selected hospital reflect individuals with good self-efficacy who recognize the challenges and seek the full potential of online learning (Bandura, 1997). This tendency has been attributed in part to the younger generation of nurses getting into the workforce who have been educated in nursing informatics in the newly revised nursing curriculum. They may have gained competencies from the nursing educational program prior to their nursing career.

A look into the history of nursing informatics in the Philippines revealed that despite the lack of standardized model and experts, the nursing informatics course was already incorporated into the nursing curriculum during the year 2008 through the Commission on Higher Education (CHED) Memorandum Order 5, Series of 2008. This was later revised and revived as Health Informatics by CHED Memorandum Order 14 implemented in the summer of 2010 (Sumabat, 2010). The current batch of nurses moving into the workforce has already been exposed to the course considering the timeframe of implementation. This may have provided the impetus to be confident in dealing with the e-learning environment.

Being an educator of nursing informatics at the university, the proponent reinforced that the course is taught at the nursing academe following the framework set by international experts. A primary reference of the course was based on the works of Staggers et al. (2001) who emphasized the competencies of computer skills, informatics competencies, and informatics skills. Provision of the course in the undergraduate level may have influenced the e-learning self-efficacy of the participants. Availability and utilization of research-based materials further molded the development of nursing informatics on a standardized scale.

Higher scores on items dealing with basic computer and online skills reinforced the notion that nursing informatics in the country is superficially taught covering only basic computer skills (Bernal et al., 2008; Sumabat, 2010). It is also highly unlikely that operating room nurses have enrolled in post-graduate education, which covers advanced informatics competencies as this is only highly required in the academic field. Another perspective may also be given on the experiential point of view as the scope of nursing in the area includes the application of skills

such as electronic encoding of surgery-related documents, use of word processing documents, accessing the internet and file downloading and uploading. Results obtained by the respondents on Cluster A (Basic Computer Skills) and Cluster C (Basic Online Skills) indicators supported this claim.

The indicators relating to Cluster B (Complex Computer Skills) is an area of concern. The data supports the perspective of local experts that only basic computer skills are focused on in the nursing informatics education of students in the Philippines (Bernal et al., 2008; Sumabat, 2010). The framework made by Staggers et al. (2001) regarding informatics competencies at 4 levels of practice also suggests that these skills belong to a higher level of complexity. This line of logic and the traditional delivery of education in the country also supports the need to improve Cluster F (Utilization of E-learning Platform) indicators. As of date, there are only a handful of academic institutions in the country fully equipped and utilizing online platforms.

Cluster D (Online Etiquette) was also pointed out as an area of concern. It is quite surprising with the participants rating themselves good with basic online skills; there still remains a need to improve online etiquette. Online etiquette involves behaviors over the net that portrays respect to others in the internet community. The course content of nursing informatics course offered locally was reviewed, and it was found out that there is no specified unit to tackle the concept of online etiquette, but this might be discussed along with the topic of online privacy and security.

Cluster E (Troubleshooting) indicators apparently are problematic. Nurses are not trained to solve computer-related issues by profession. In fact, the informatics competencies collectively merged by Staggers et al. (2001) along the four levels of practice, and the list of competencies presented by the Technology Informatics Guiding Educational Reform (TIGER) (Fung, 2016) did not include troubleshooting of computer hardware, software or networking as an essential skill of a nurse.

Limitations

The exposure of participants to e-learning and similar technology along their course of work may affect the findings of this study. As of date, Cebu Doctors' University Hospital (CDUH) has started incorporating an electronic health record and hospital information system in selected units of the institution such as the emergency room and pharmacy. These systems have yet to be streamlined into the overall operations of the hospital. The participants may have been oriented to these applications according to their previous assignments and rotation. Some staff nurses may also have enrolled in post graduate programs which deliver courses through e-learning and other online modalities.

Recommendations

This paper has dealt with e-learning self-efficacy as a major indicator of e-learning readiness. It is one of the major prerequisites to initiate and sustain e-learning as a new modality of education and training among operating room nurses. In line with this, it is recommended to explore and look into other domains of readiness to fully utilize and harness the potential of this technology into the field of health care. Literature offers other factors that may influence e-learning readiness such as availability of human resources, access to technology, infrastructure support and personal attributes including study habits, motivation, time management and self-directed learning. With the findings that the operating room nurses are

in the positive spectrum of readiness in terms of e-learning self-efficacy, future researches may be conducted to develop, incorporate and determine the effects of e-learning towards the education and training of these care providers.

Conclusion

The operating room nurses of the selected hospital have positive e-learning self-efficacy based on the item analysis and secondary indicator-clusters analysis. Item analysis reflected the distribution of responses and item means of the respondents to be on the higher end level of self-efficacy based on the Modified E-learning Readiness Assessment Tool (MERAT). Cluster analysis also revealed that the participants perceived themselves to be “Very Good” in terms of complex computer skills, online etiquette, troubleshooting computer-related issues and usage of an e-learning platform, and “Excellent” in terms of basic computer and online skills.

The operating room nurses involved in the study portray individuals with good self-efficacy (Bandura, 1997) as those who recognize the challenges and seek the full potential of online learning. Hence, e-learning initiatives may still diffuse well into the health care system to augment education and training of nurses despite manpower shortage and issues surrounding the incorporation of informatics competencies into their knowledge and skills base.

References

- Akaslan, D., & Law, E. L.-C. (2011). Measuring teachers' readiness for e-learning in higher education institutions associated with the subject of electricity in Turkey. *2011 IEEE Global Engineering Education Conference (EDUCON)*.
<https://doi.org/10.1109/educon.2011.5773180>
- Alqurashi, E. (2016). Self-efficacy in online learning environments: A literature review. *Contemporary Issues in Education Research (CIER)*, 9(1), 45–52.
<https://doi.org/10.19030/cier.v9i1.9549>
- Arimbuyutan, R. C., Kim, S., Song, J., & So, W. (2007). A study on e-learning for Philippines. *International Journal of Multimedia and Ubiquitous Engineering*, 2(4), 49–54. <https://doi.org/10.14257/ijmue.2007.2.4.05>
- Aydin, C. H., & Tasci, D. (2005). Measuring readiness for e-learning: Reflections from an emerging country. *Educational Technology & Society*, 8(4), 244–257.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W.H. Freeman.
- Bernal, A. B. S., Tolentino, P. A. P., Gavino, A. I., Fontelo, P., & Marcelo, A. B. (2008). Nursing informatics: Challenges to Philippine nursing curriculum. *AMIA Annual Symposium Proceedings*. Nov. 6, 876.
- Demir, Ö., & Yurdugül, H. (2015). The exploration of models regarding e-learning readiness: Reference model suggestions. *International Journal of Progressive Education*, 11(1), 173–194. <https://doi.org/10.18844/ijire.v1i1.117>
- Dray, B. J., Lowenthal, P. R., Miskiewicz, M. J., Ruiz-Primo, M. A., & Marczyński, K. (2011). Developing an instrument to assess student readiness for online learning: a validation study. *Distance Education*, 32(1), 29–47.
<https://doi.org/10.1080/01587919.2011.565496>
- Doculan, J. A. D. (2016). E-Learning readiness assessment tool for Philippine higher education institutions. *International Journal on Integrating Technology in Education*, 5(2), 33–43. <https://doi.org/10.5121/ijite.2016.5203>
- Fung, K. Y. M. (2016). *Utilizing TIGER competencies to improve informatics practice*. Doctor of Nursing Practice Projects, 76. School of Nursing and Health Professions: University of San Francisco.
- High Level Forum on the Health MDGs (2004) *Summary of discussions and agreed action points*. Geneva: High Level Forum. <http://www.who.int/hdp/en/summary.pdf>
- Hung, M.-L., Chou, C., Chen, C.-H., & Own, Z.-Y. (2010). Learner readiness for online learning: Scale development and student perceptions. *Computers & Education*, 55(3), 1080–1090. <https://doi.org/10.1016/j.compedu.2010.05.004>
- Institute of Health Policy and Development Studies. (2006). *Migration of health workers: Country case study Philippines*. Geneva: International Labour Office.
<http://www.ilo.org/public/english/dialogue/sector/papers/health/wp236.pdf>
- International Council of Nurses. (2006). *The global nursing shortage: Priority areas for intervention*. Geneva: International Council of Nurses.
- Jan, S. K. (2015). The relationships between academic self-efficacy, computer self-efficacy, prior experience, and satisfaction with online learning. *American Journal of Distance Education*, 29(1), 30–40. <https://doi.org/10.1080/08923647.2015.994366>

- Kadivar, M., Seyedfatemi, N., Zolfaghari, M., Mehran, A., & Hossinzade, Z. (2016). The impact of virtual-based education on nurses' self-efficacy in the level II neonatal care. *Journal of Critical Care Nursing*, 9(4). <https://doi.org/10.17795/ccn-9281>
- Kuo, Y.-C., Walker, A. E., Schroder, K. E., & Belland, B. R. (2014). Interaction, internet self-efficacy, and self-regulated learning as predictors of student satisfaction in online education courses. *The Internet and Higher Education*, 20, 35–50. <https://doi.org/10.1016/j.iheduc.2013.10.001>
- K-12 Blueprint (2014). *Learning management system (LMS) guide*. <https://www.k12blueprint.com/sites/default/files/Learning-Management-System-Guide.pdf>
- Lim, C. K. (2001). Computer self-efficacy, academic self-concept, and other predictors of satisfaction and future participation of adult distance learners. *American Journal of Distance Education*, 15(2), 41–51. <https://doi.org/10.1080/08923640109527083>
- Lin, Y.-C., Liang, J.-C., Yang, C.-J., & Tsai, C.-C. (2013). Exploring middle-aged and older adults' sources of internet self-efficacy: A case study. *Computers in Human Behavior*, 29(6), 2733–2743. <https://doi.org/10.1016/j.chb.2013.07.017>
- Littlejohn, L., Campbell, J., Collins-McNeil, J., & Thembisile, K. (2012). Nursing shortage: A comparative analysis. *International Journal of Nursing*, 1(1), 22–27. <https://doi.org/10.1.1.300.9995>
- Maertens, H., Madani, A., Landry, T., Vermassen, F., Herzeele, I. V., & Aggarwal, R. (2016). Systematic review of e-learning for surgical training. *British Journal of Surgery*, 103(11), 1428–1437. <https://doi.org/10.1002/bjs.10236>
- Moftakhari, M.M. (2013). *Evaluating e-learning readiness of faculty of letters of Hacettepe*. Ankara, Turkey: Hacettepe University.
- Momanyi, N. B., & Kaimenyi, C. K. (2015). An investigation into factors causing high nurse turnover in mission hospitals in Kenya: A case for Pcea Chogoria hospital. *International Journal of Academic Research in Business and Social Sciences*, 5(3). <https://doi.org/10.6007/ijarbss/v5-i3/1499>
- Oliver, R. G. (2001). *Assuring the quality of online learning in Australian higher education*. Proceedings of 2000 Moving Online Conference (pp.222-231). Gold Coast, QLD.: Norsearch Reprographics
- Pellas, N. (2014). The influence of computer self-efficacy, metacognitive self-regulation and self-esteem on student engagement in online learning programs: Evidence from the virtual world of Second Life. *Computers in Human Behavior*, 35, 157–170. <https://doi.org/10.1016/j.chb.2014.02.048>
- Simmering, M. J., Posey, C., & Piccoli, G. (2009). Computer self-efficacy and motivation to learn in a self-directed online course. *Decision Sciences Journal of Innovative Education*, 7(1), 99–121. <https://doi.org/10.1111/j.1540-4609.2008.00207.x>
- Smith, P.J. (2005). Learning preferences and readiness for online learning. *Educational Psychology: An International Journal of Experimental Educational Psychology*, 25(1), 3–12.
- Staggers, N., Gassert, C. A., & Curran, C. (2001). Informatics competencies for nurses at four levels of practice. *Journal of Nursing Education*, 40(7), 303–316.

- Sumabat, K. R. (2010). History of nursing informatics in the Philippines. http://cebunursinginformatics.weebly.com/uploads/5/0/0/6/5006028/history_of_nursing_informatics.pdf
- Takase, M. (2010). A concept analysis of turnover intention: Implications for nursing management. *Collegian*, 17(1), 3–12. <https://doi.org/10.1016/j.colegn.2009.05.001>
- Tang, Y., & Tseng, H. W. (2013). Distance learners' self-efficacy and information literacy skills. *Journal of Academic Librarianship*, 39(6), 517–521. <https://doi.org/10.1016/j.acalib.2013.08.008>
- Tubaishat, A., & Lansari, A. (2011). Are students ready to adopt e-learning? A preliminary e-readiness study of a university in the Gulf Region. *International Journal of Information and Communication Technology Research*, 1(5), 210–215.
- Valtonen, T., Kukkonen, J., Dillon, P., & Väisänen, P. (2009). Finnish high school students' readiness to adopt online learning: Questioning the assumptions. *Computers & Education*, 53(3), 742–748. <https://doi.org/10.1016/j.compedu.2009.04.014>
- Watkins, R., Leigh, D., & Triner, D. (2008). Assessing readiness for e-learning. *Performance Improvement Quarterly*, 17(4), 66–79. <https://doi.org/10.1111/j.1937-8327.2004.tb00321.x>
- Womble, J. C. (2007). *E-learning: The relationship among learner satisfaction, self-efficacy, and usefulness*. (Unpublished doctoral dissertation), Alliant International University, San Diego.

Corresponding author: Paul John G. Aventurado

Contact email: pjaventurado0521@gmail.com

eHealth Literacy of High School Students in the Philippines

Mark Kenneth S. Camiling
University of the Philippines, Diliman, Philippines

Abstract

The Internet has become a chief health information source. It is posited that people who use the Web for health information must possess requisite eHealth literacy to avoid misuse. eHealth literacy refers to the skills in searching, retrieving, understanding, evaluating, and applying online health information to alter or maintain well-being. This research employed mixed methods of data collection, following a three-phase explanatory sequential design: 1) survey and eHealth literacy test, 2) focus group discussion, and 3) observational study, to describe the state of eHealth literacy of high school students in terms of their online health information seeking behaviors, search, retrieval, and evaluation strategies, actual eHealth literacy levels, and perceived eHealth literacy levels. Furthermore, the research aimed at investigating the relationships among school type, actual eHealth literacy levels, and perceived eHealth literacy levels. Results show that students are adept in searching and retrieving online health information. However, their evaluation strategies are suboptimal as they lack ability to check for content accuracy and source credibility. Findings also reveal a significant relationship between school type and perceived eHealth literacy levels, $X^2(2, N=263) = 14.21, p=0.00, \alpha=0.05$. Private school students tend to score their perceived eHealth literacy levels higher. There is also a significant difference between actual eHealth literacy levels and perceived eHealth literacy levels, with students rating their perceived eHealth literacy levels ($M=32.45, SD=6.10, N=40$) higher than their actual eHealth literacy levels ($M=29.13, SD=2.92, N=40$), $t(40)=4.16, p=0.000, \alpha=0.05$. It is concluded that while students are adept in computer and traditional literacies, they still need to further develop health and information literacies to effectively evaluate and apply the searched and retrieved online health information.

Keywords: eHealth, eHealth literacy, high school students

According to Internet Live Statistics (2016), about 50% of the world population is connected to the Internet. In the local setting, the Philippines registered an Internet Penetration Rate (IPR) of 43.5%. Furthermore, according to Cruz (as cited in Bristol, Caro, Mangaliman, & Bernarte, 2016), 60% of Filipino Internet users belong to the youth category of 15-19 years old, the largest representation in national figures. In the report of Bayani (2014, para. 8), global information and measurement company, Nielsen, found that a few of the top online activities of Filipinos are logging on to social networking sites, participating in online discussions and chatrooms, and conducting academic research.

“The Internet, with its capacity to provide information that transcends time and space barriers, continues to transform how people find and apply information to their own lives” (Seckin, Yeatts, Hughes, Hudson, & Bell, 2016, p. e161). Hence, the emergence of the Internet has rapidly changed the paradigm of information consumerism, particularly in the health sector. Fox and Duggan (2013) found that 72% of Internet users in the United States searched for online health information. Tracing the early years of the 20th century, one in three adolescents used the Internet as a reference for health information (Lenhart, Madden, & Hitlin, 2005). Fox and Duggan (2013) further found that the majority of Internet users sought information about a specific condition or disease to medically diagnose themselves. Moreover, 28% of these users did not follow up further with a medical professional. According to Atienza, Hesse, Gustafson, and Croyle (as cited in Seckin et al., 2016), they generally consult the Internet first before their physician. These reports imply a strong, apparent influence of the Internet in the way people manage their health and well-being.

Though access to online health information may develop the consumer to become empowered and reflexive, Im (as cited in Seckin et al., 2016) strongly declares that regardless of one’s level of reflexivity and empowerment, a person must still possess a requisite high level of health literacy to avoid information misuse. Health literacy has blended in and evolved with the advancement of technology and onset of Internet access. Hence the emerging concept of eHealth literacy is coined and explored.

eHealth literacy is defined as “the ability to read, use computers, search for information, understand health information, and put it into context” (Norman & Skinner, 2006a, p. e27). Simple as it may seem, eHealth literacy is a multi-skill competency. The ability to navigate the computer and access health information requires complex processes. Understanding health knowledge involves critical evaluation of the acquired information. Lastly, putting the information into real-life context entails careful reflection while being faced with various decision-making mediators.

There have been numerous studies that have attempted to provide descriptions of, indicators of, and/or baseline data on eHealth literacy of various populations such as adolescents (Ghaddar, Valerio, Garcia, & Hansen, 2012), adults (Marazienė, Klumbienė, Tomkevičiūtė, & Misevičienė, 2012), and health information and services consumers in general (AlGhamdi & Moussa, 2012). However, these studies were conducted by foreign researchers. Hence, there is a wide gap between the global research development on the emerging concept of eHealth literacy and the findings from within the Philippines.

Apart from the studies previously mentioned, it is imperative to initiate research on this emerging field because the advent of technology has prompted schools to revitalize their curricula in order to respond to the needs of the learners. To contextualize, competencies on digital literacy and consumer health have been incorporated into the Enhanced K-12 Basic Education Curriculum of the Philippines since its implementation in 2012. Though there is no

competency specifically targeting the development of eHealth literacy, its components are taught separately across subjects and grade levels.

The rationale for this research is the need for immediacy to address the absence or lack of contextualized studies on eHealth literacy. This research aimed to consolidate the theoretical underpinnings of the concept in an attempt to quantify the eHealth literacy of the most ideal sample, adolescents, particularly those who are transitioning from secondary to tertiary education, where the level of independence and reflexivity is increased. This study focuses on Filipino high school students and specifically investigated the following research questions:

1. What is the state of eHealth literacy of high school students in the Philippines in terms of online health information-seeking behavior, strategies for search and retrieval of online health information, criteria for evaluating online health information, and perceived and actual eHealth literacy levels?
2. What relationship exists among school type, perceived eHealth literacy level, and actual eHealth literacy level?
3. Is there a significant difference between the perceived and actual eHealth literacy levels of high school students in the Philippines?

Literature Review

Defining eHealth Literacy

eHealth literacy is a combination of different literacies simultaneously applied in eHealth conditions such as facing online health information and availing of Internet health services. Norman and Skinner (2006b) developed the Lily Model (Figure 1) to illustrate the facets of various literacies incorporated in eHealth literacy: traditional literacy and numeracy, and computer, media, science, information, and health literacies. The researchers explain that these are further categorized into two central types or models – *analytic* and *content-specific*. Analytic literacies are a set of skills that are practiced regardless of the content or situation. Content-specific literacies apply to particular situations.

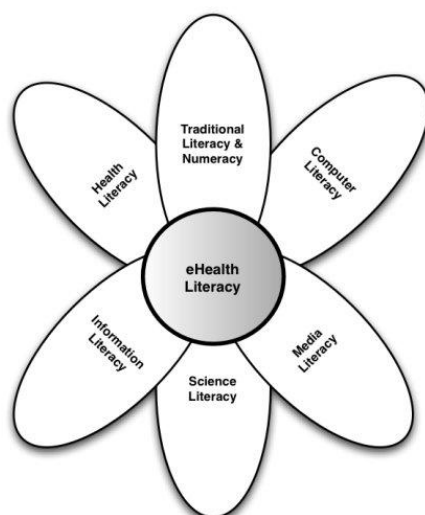


Figure 1: The eHealth Literacy Lily Model (Norman & Skinner, 2006b, eHealth Literacy Model, para. 1)

The lily metaphor used by the researchers seamlessly represents how eHealth literacy operates in the minds of individuals. In its practice, each of the literacy components is applied independently, whether simultaneously or consecutively. However, efficacy in the application of eHealth literacy greatly relies on the interdependence of all its components. The eHealth literacy as the pistil, as used by Norman and Skinner (2006b), encapsulates this interrelationship – the central concept holding its components [petals] which have their respective characteristics.

Online Health Information Search, Retrieval, and Evaluation

Online health information-seeking behaviors, patterns, and skills have become an emerging field in health research over the past two decades. For example, in the study of Eysenbach and Kohler (2002), it was uncovered that people find it “easier to access the quality of information on the [Inter]net than elsewhere because they could verify and cross check the information on different sites” (p. 575). However, it also discovered that their search techniques of the online users are suboptimal. It means that they are not utilizing effective strategies to retrieve accurate, complete, and reliable information. The researchers further reported that this state is due to reasons such as inability to utilize medical portals or sites of medical societies or libraries as a starting point and usually choosing the first results displayed by the search engine without exploring the succeeding pages. The participants were also asked about what they consider in checking the website reliability. They mentioned criteria such as professional layout and writing, indication of official authority, and citation of scientific references.

Measuring eHealth Literacy

Little is known about how to quantitatively measure eHealth literacy. Pleasant (2009) argues that while existing tests are comprehensive, they are merely screening tools. He explains that “the goal of screening is to divide people into healthy and sick categories and it does not tell what is actually wrong with the patient” (p. 18). In the same light, Baker (2006) posits that the measurement of literacy must also involve the individual’s reading ability and vocabulary, not only their health status. Considering that literacy operates through interactive relationship among individuals and the healthcare system, he further stressed that measuring the communication capacities of the person is also necessary.

As the instruments evolve to cater to the changing profiles of the population, contexts at which the individuals are assessed adjust as well. According to the Institute of Medicine (as cited in Norman & Skinner, 2006a), there is “a need to look at the different contexts where health information is obtained and used as part of a strategy of addressing health literacy” (Introduction section, para. 4). These contexts include electronic sources. This has been the inspiration of Norman and Skinner (2006a) in developing the eHealth Literacy Scale (eHEALS) which is “a self-report tool that can be administered by a health professional and is based on an individual’s perception of her or his own skills and knowledge within each measured domain” (p. e27). It is crafted to measure individual’s estimated literacy level, used to make clinical decisions. Contextualizing the aims of this present study, it may be inferred that the instrument most appropriate to use is the eHEALS as it is the only instrument that provides if not actual – at the very least perceived – a quantitative measure to describe the eHealth literacy profile of an individual.

eHealth Literacy and Adolescents

It is ideal to identify the youth as a focus for eHealth literacy studies for many reasons. First, adolescents are about to enter college life, which is “a transitional time for taking charge of their own health and maintaining a healthy lifestyle, which is essential to their academic achievement and their overall adult health outcomes” (Ma & Latham, 2013, p. 793). Second,

they are highly familiar with technology as evidenced by their high IPR (Cruz, as cited in Bristol et al., 2016). This is further supported by Norman and Skinner (2006a) when they sampled youth in their research because of the age group's high level of eHealth use. Third, adolescents are found to experience difficulty “engaging with eHealth and understanding or using health information online” (Gray, Klein, Noyce, Sesselberg, & Cantrill, 2005 in Norman & Skinner, 2006a, Introduction, para. 7). In addition, Ivanitskaya, Boyle and Casey (2006) concluded in their study that adolescents do not possess the ability to “conduct advanced information searches, judge the trustworthiness of health-related websites and articles, and differentiate between various information sources” (Conclusions, para. 1). The authors further stated that even if adolescents reported high confidence in perceived eHealth literacy, their skills are still not an accurate predictor of their health information competencies. It is hypothesized by Norman and Skinner (2006a) that the longer the exposure of an individual to technology, the more likely s/he to use it as a tool to aid in health management.

Therefore, as adolescents grow in technology-rich environments, they will continue to seek health information from these digital sources. With this inference, it is of high importance that continuous research be conducted in order to appropriately and adequately address the adolescents' eHealth literacy needs through intervention provisions.

eHealth Literacy in the Philippine National Curriculum

As of this writing, there is no competency in the Philippine national health education curriculum that deliberately and specifically covers the development of eHealth literacy across elementary and high school. However, the components of eHealth literacy are taken independently. For example, sources of reliable information are initially discussed in Grade 3. It is the terminal lesson in the 3rd Quarter wherein at the end, the students are expected to “[identify] reliable sources of health information” (Department of Education, 2016, p. 36). The following are the sources of health information explicitly mentioned in the document: a) government agencies, b) health professionals, and c) printed materials produced by health professionals or legitimate health institutions. On the other hand, it is in the health curriculum of Grade 10 when evaluation of health information is tackled. The learning competencies required of the students after they study consumer health in the 1st Quarter (p.87) are: differentiates reliable from unreliable health information, products, and services; explains the guidelines and criteria in the selection and evaluation of health information, products, and services; explains the nature and dangers of quackery; and reports fraudulent health services. Although these topics are not “online” in nature, it must be posited that high school students are equipped with skills needed in the practice of eHealth literacy.

Methodology

Research Design and Methods

The study employed a three-phase explanatory sequential mixed methods design (Cresswell & Plano Clark, 2007): survey and eHealth Literacy Test (eHLT), focus group discussion (FGD), and observational study (OS). The first phase aimed at eliciting the respondents' demographic profile and online health information-seeking behavior. It was followed by FGD to gather qualitative data on factors that influence the state of eHealth literacy of the high school students and their retrieval and evaluation strategies. Finally, the last phase elicited observations on the personal search and retrieval processes of the high school students given a specific task.

The research was conducted within the school year when it commenced. Furthermore, the data gathering procedures were carried out consecutively with short intervals. This is due to factors such as time, experience, exposure to technology, and learning of new concept and skills in

regular class that may affect the perceived and actual levels of eHealth literacy of the high school students.

Sample and Sampling Procedures

The research was conducted in Quezon City, Metro Manila to ensure variation in student characteristics. It has also the highest student population in the country. In addition, Metro Manila registered the highest IPR of 19% in the country (Social Weather Stations, 2013; as cited in Labucay, 2014).

Grade 10 students from four private and four public schools were purposively chosen because at the time this study has been conducted, they have completed the core competencies of the national health curriculum, particularly on consumer health.

There were two sampling procedures employed. The first determined the survey and eHLT participants. The eight schools were chosen through criterion sampling. Medium and large schools, as categorized by the Department of Education, were considered to ensure maximum variation. Excluding homogenous classes, the section in each school was selected through random sampling. The number of respondents in each school varied as intact class sampling was employed. Tables 1 and 2 describe the demographic information of the participants.

Table 1: Population of schools

School	School Population*	Grade 10 Population	Sample Surveyed	Invalidated Surveys**	Actual Sample Size	Actual Sample Size by School Type
A	368	71	29	3	26	Private = 128
B	975	168	43	4	39	
C	297	92	39	3	36	
D	***	224	29	2	27	
E	2748	622	39	7	32	Public = 146
F	3314	607	40	4	36	
G	3126	658	36	4	32	
H	1978	510	48	2	46	
Total			303	29	274	274

*both Junior and Senior High Schools

**incomplete and incorrectly answered

***did not disclose

Table 2: Demographic information of survey and eHLT respondents

	School								Total
	A	B	C	D	E	F	G	H	
Sex:									
Male	16	14	22	14	14	13	14	21	128
Female	10	25	14	13	18	23	18	25	146
Age:									
15	13	11	14	9	15	8	4	17	91
16	11	26	16	14	13	20	16	20	136
17	2	1	5	3	2	6	9	7	35
18	-	1	1	1	1	1	-	2	7
19	-	-	-	-	-	1	3	-	4
20	-	-	-	-	1	-	-	-	1

The second sampling procedure was carried out to identify the FGD and OS participants. Through purposive sampling, four schools (a pair from each school type) with the highest and lowest means of perceived eHealth literacy level were considered. Table 3 shows the results of the eHLT. Ten students from Schools A, B, E, and H participated in the FGD and OS. These students were composed of the five respondents who scored the lowest and five who scored the highest perceived eHealth literacy levels. Table 4 details their demographic information.

Table 3: eHLT results

Type	School	Mean
Private	A	31.77
	B	35.21
	C	33.00
	D	32.67
Public	E	28.44
	F	29.31
	G	30.06
	H	32.47

Table 4: Demographic information of FGD and OS participants

	School				Total
	A	B	E	H	
Sex:					
Male	6	2	6	5	19
Female	4	8	4	5	21
Age:					
15	5	1	4	5	15
16	4	8	4	2	18
17	1	-	1	3	5
18	-	1	1	-	2

Research Instruments

The research instruments utilized in the study are the survey, eHLT, and eHealth Literacy Rubric (eHLR), which are supplemented with guides for the conduct of the FGD and OS.

a. Survey

The survey is based on the instrument developed by TNS Political & Social (2014) as published in their research on digital health literacy of European citizens. The first of two parts collected demographic information. The second part is composed of open- and close-ended questions that elicited information on the students' online health information-seeking behaviors.

b. eHLT

Administered simultaneously with the survey, the eHLT was utilized to investigate the respondents' perceived eHealth literacy level. It was developed by the researcher as a derivation of Norman and Skinner's eHEALS (2006a). It measured the respondents' perceived level of effectiveness in the completion of tasks related to the application of eHealth literacy. The respondents assigned a perceived level of effectiveness in accomplishing each task. The ratings and their corresponding descriptions are listed in Table 5.

Table 5: eHLT rating of task effectiveness

Rating	Description
4	I can do the task alone confidently and effectively.
3	I can do the task effectively but with minimal assistance from another person.
2	I can do the task when fully assisted by another person.
1	I cannot do the task alone or even with assistance from another person.

In the context of online health information search and retrieval to address a health concern or problem, Table 6 presents the tasks in the sequence of accomplishment and the literacies being practiced.

Table 6: eHLT tasks

Task	Literacy/ies
1. Understand the information needed to search for when asked to address a health concern or problem	Traditional literacy and numeracy
2. Tell whether the technological tool is connected to the Internet or not	Computer
3. Identify appropriate software applications to use to search for online health information	Computer
4. Navigate the software application used to search for online health information	Computer
5. Identify websites that are credible sources of health information	Health and information
6. Check if an unfamiliar website is a credible source of health information	Health and information

7. Understand the language used in the information presented	Traditional literacy and numeracy
8. Identify helpful information from a text presented	Health, information, media, and science literacies
9. Tell whether the online health information is accurate or not	Health, information, and science
10. Explain the answer to a health concern after searching and retrieving online health information	Traditional literacy and numeracy

c. eHLR

The eHLR is a researcher-developed rubric used to score the respondents' actual performance of eHLT tasks during the simulation activity in the OS.

Prior to data gathering, an expert validation and a pilot study were administered to ensure the validity and reliability of the research instruments. Four content professionals and one language expert participated in the expert validation. The pilot study was conducted in two secondary schools: one public and one private.

Having an expert validation rating of *Exceeds expectation* (Survey: $M=3.75/4.00$; eHLT: $M=3.91/4.00$; eHLR: $M=3.81/4.00$), *Good* Cronbach's alpha (α) of 0.82 from the pilot study, and no major recommendations for language revision, the results of the instrument validation and pilot study indicated that the research tools are valid and reliable.

Data Analysis

The resulting data from the various methods of collection were rendered and analyzed through different means. The data analysis procedure is subdivided into three phases.

Phase one. Descriptive statistics were employed to organize survey data which include the demographic profile and the prevalence and patterns of online health information-seeking behaviors.

The eHLT was scored accordingly, with minimum score of 10 and maximum of 40. This determined the perceived eHealth literacy level. As the score adds, the level increases. Table 7 indicates the range of scores and corresponding proficiency levels. This is based on the study of Cutilli and Benett (2009, Results of the NAAL section), where adult health literacy in the United States was evaluated through a series of tasks. Proficient eHealth literacy refers to the ability to perform complex tasks such as knowing how to properly use online health information and evaluate content validity and source credibility. Intermediate eHealth literacy refers to skills that allow the person to perform moderately complex tasks such as knowing where to find helpful health information on the Internet. Basic eHealth literacy refers to the ability to perform simple tasks such as accessing the Internet. Below basic eHealth literacy describes the skill level below simple and concrete tasks, which include the inability to use technology to access online health information.

Table 7: eHLT proficiency levels

Score	Level
29 – 40	Proficient
24 – 28	Intermediate
19 – 23	Basic
10 – 18	Below Basic

Phase two. The results of the FGD were rendered through thematic analysis. On the other hand, each respondent's effectiveness in the performance of eHealth literacy-related tasks during the OS was scored accordingly using the eHLR. The same scoring and assignment of literacy levels used in the eHLT evaluation were utilized. The results from the eHLR yielded each participant's actual eHealth literacy level.

Phase three. Using IBM SPSS Statistics version 20 for Windows, inferential statistics were employed to answer Research Questions 2 and 3. A chi-square test was administered to describe the relationship that exists among school type, perceived eHealth literacy level, and actual eHealth literacy level. In addition, a paired samples *t*-test was administered to determine if there is a significant difference between the means of perceived and actual eHealth literacy levels of the high school students.

Ethical Considerations

Several ethical guidelines were upheld in the conduct of the study. The well-being of the respondents was protected at all times, with their identities kept confidential. Necessary permits were also secured from appropriate channels prior to administration of any data gathering procedure. Informed consent, verbal assent, and written consent were also secured wherever imperative to do so. No individual was forced to participate in the study and all were given freedom to leave the study any time they feel the need to do so.

Results and Discussion

Access to the Internet and Online Health Information

It is not surprising that 100% of the respondents in this study reported access to the Internet, with personal gadgets used most frequently (at 92.0%). The age group of the respondents makes up the biggest populace of Filipino Internet users. According to On Device Research (2014), 53% of Filipino Internet users are under the age of 24. In terms of frequency of use, 89.8% of the respondents reported daily access to the Internet. This percentage even surpasses the finding of Labucay (2014) that three-fifths of Filipino Internet users are "frequent to moderate users" (p. 39), accessing the Web a few times or at least once daily.

Of those who access the Internet, 96% reported searching for online health information, with personal gadgets remaining to be the top choice for use (at 89.4%). Of this percentage, 47.5% conveyed that they do so weekly, while 41.4% reported monthly access. The high percentage of reported access to online health information even exceeds the range of 40%-73.4% described in existing literature on adolescents (Jimenez-Pernett, de Labry-Lima, Bermudez-Tamayo, Garcia-Gutierrez, & Salcedo-Sanchez, 2010). These also support the findings of Labucay (2014) as she reported that health, dieting, and fitness information-seeking and -learning are one of the major online activities of Internet users.

Type of Health Information Searched Online

The types of health information searched for by the respondents vary. In general, most of the information gathered by the students is about personal health (60.8%), nutrition (58.2%), and injury prevention, safety, and first aid (52.5%). This finding supported the study of Fernando-Callo (2009) on high school students' expressed health interests. She reported that the top three health interest topics are about mental health, nutrition, and safety education and first aid.

These concerns are linked to health risk behaviors reported by Peltzer and Pengpid (2015) in their cross-sectional study on the results of the 2003, 2007, and 2011 Global School-based Health Survey to investigate the trends in the health risk behaviors of adolescents aged 10-19. These behaviors include improper dieting, lack of physical activity, increased sedentary habits, injury and violence involvement, and practices that contribute to poor mental health. According to Miguel-Baquilod (as cited in Peltzer & Pengpid, 2015, p. 1), risk behaviors relative to the aforementioned list are correlated with the leading causes of death among the youth in the Philippines.

Peltzer and Pengpid (2015) reported that there were significant improvements in malnutrition and mental health over the nine-year coverage of the study. However, it has been found that there is an increase of health risk behaviors that pertain to bullying, injury, and loneliness. This particular finding of their research is indicative of this study's results on the specific health concerns being searched for online by the respondents.

The high percentage of information search about mental health also supports the results of the 2015 National Youth Assessment Study reported by Cendeña (2017). Cendeña mentioned that 20% of the 2,762 respondents "have experienced extreme emotional distress" (p. 20), while about a third "thought at least once that life was not worth living" (p.20). This may be an underlying reason why this study's participants reported the highest frequency of online information search for mental health concerns.

Sources and Consumers of Online Health Information

Results show that 63.5% of the respondents use Google Chrome, Mozilla Firefox, Bing, Yahoo, Safari, and Internet Explorer for health information search. These bridge the Internet users to various websites that offer health content. Boyer & Geissbuhler (2006, in Jimenez-Pernett et al., 2010) posit that these mechanisms are most frequently used "because they are very easy, accessible, fast, and contain a great deal of information" (p.5).

At 42.6%, the second most frequently visited source of online health information are social media sites. Official websites of government and non-government health organizations ranked fourth at 14.4%. Online newspapers and magazines are reported to be the least common source of online health information at 12.5%.

Jacobs, Amuta, and Kwon (2017) mentioned that the motivations behind the health information-seeking behavior are the individual's perception of health, health status, and family health history. This is consistent with the results of this study's survey. When asked for whom the health information search is for, 72.6% of all respondents reported that they are the mere consumers of the information. Only 25.1% searches online health information for their family members and a low of 2.3% for their friends.

The survey also prompted the respondents to identify all possible reasons for online health information search. A high percentage of 65% stated that they wanted to gain additional knowledge on the topics searched. It is interesting to note that private and public schools differ

on the second most common reason for searching online health information. Among students from public schools, 13.0% reported that they seek clarification in the Internet regarding the opinion they gathered from a medical check-up. In the private school setting, 8.0% of the students indicated that they search for online health information to guide them in buying a health product or availing of a health service.

Perceived eHealth Literacy

The results of the eHLT revealed that the respondents perceive their eHealth literacy level as proficient at $M=31.75$ ($n=263$). The mean eHLT scores of students from private and public schools are 33.30 ($n=125$) and 30.30 ($n=138$) respectively. These results indicate that generally, the students' eHealth literacy level is proficient. Figure 2 indicates the complete eHLT results.

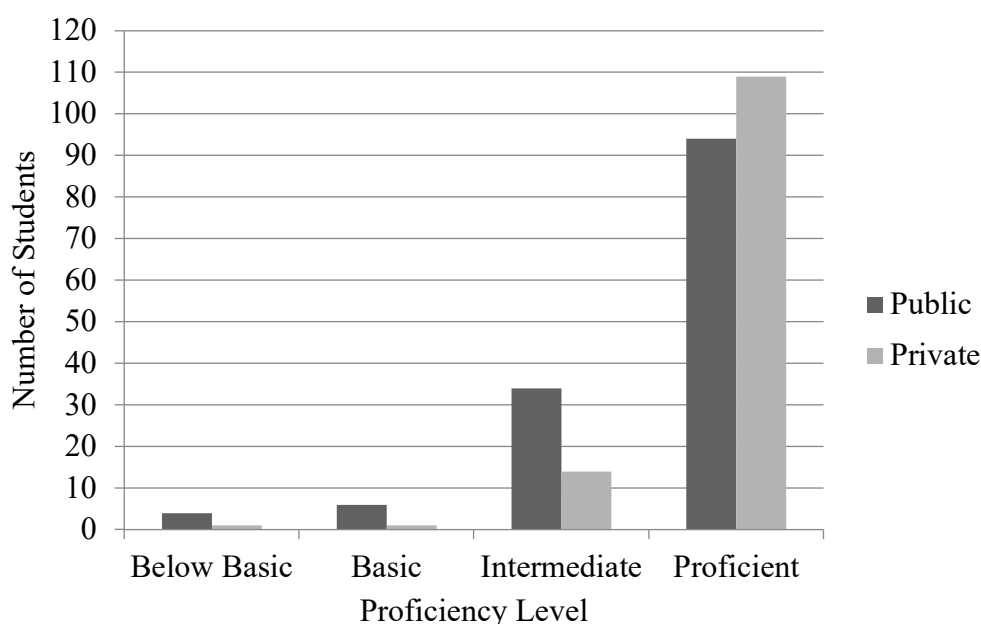


Figure 2: Perceived eHealth literacy levels

The eHLT also indicated that the participants are most confident in efficiently performing tasks that practice their computer and traditional literacies. These include the ability to understand the information needed to retrieve to address the health concern ($M=3.21$), to tell whether the tool is connected to the Internet or not ($M=3.35$), to identify the software application needed to retrieve online health information ($M=3.22$), to navigate the software application ($M=3.16$), and to understand the language used in the presentation of information ($M=3.30$). Different factors may explain this trend. First, it has been established that today's youth are tech-savvy. Second, this is supported by the high basic and functional literacy rates of the country. In the Philippine in Figures 2017 Report of the Philippine Statistics Authority (2017), the basic literacy rate of Filipinos in 2013 is 96.5% while the functional literacy rate is 90.3%.

On the other hand, they scored their lowest efficiency in tasks that apply health and information literacies. The majority of the respondents reported difficulty and need of full assistance from another person in explaining the answer to a health concern after an information search ($M=3.15$), identifying credible websites ($M=3.10$), checking the credibility of an unfamiliar website ($M=3.01$), and proving the accuracy of the online health information ($M=2.98$).

Focus Group Discussion

FGD results revealed that the participants preferred Google Chrome as their starting point in searching and retrieving online health information due to its speed and variety of references. The participants also reported the use of both English and Filipino in accessing online health information. There are more participants from private schools who type keywords on the search engine because for them, it will provide more varied scope. The sentence or question form is more preferred by participants from public schools as they think it provides them exact information they need to address their concern or question. When asked which from the Google results list is first chosen, the majority of the respondents reported that they select the first website because they think it is the most rated and reliable.

Upon analyzing the emerging themes, there are only three main criteria used by the respondents to evaluate the credibility of the online health information: user rating and review, commonality of content across websites, and authority of source. It may be deduced that the criteria are somewhat ineffective. For one, user rating and review may not necessarily guarantee the accuracy of content. The anonymity of the source is already a cause of doubt and worry. Moreover, the commonality of content across websites is neither a reliable criterion because information can easily be disseminated online by anyone. It is only the authority of source that has high reliability in terms of discerning the trustworthiness of the source. In terms of action taken after information retrieval, the majority of the respondents reported that they immediately applied the information to address their concerns through self-medication, which has no guarantee of effectiveness and may pose great harm.

Observational Study

The search and retrieval process was simulated during the OS. The 40 respondents visited a total of 113 webpages from 35 unique websites. The average time in finishing the search and retrieval process is 7 minutes 20 seconds. All participants used Google Chrome as a starting point and Google Search as the engine for information retrieval. With relatively fast duration of search and familiarity with online navigation, it was observed that the students are adept in terms of their computer literacy.

The majority of the health concerns searched were phrased in English. In analyzing the quality of search, it is imperative to validate whether the phrase or sentence searched is accurate to the concern being addressed. Although the majority of the participants scored high in their ability to understand the information needed to search ($M=3.55$), which is a skill practiced in traditional literacy, there is disparity in terms of phrasing the information. There were instances when the information typed in the search bar included unnecessary details. In addition, none of the participants utilized Boolean operators for a more efficient search.

About 60% of the participants clicked the first website in the results list. 90% of the respondents reported lack of familiarity with the websites they visited. When asked to check for credibility, almost half admitted to having no idea. When probed by the researcher, the students mentioned that they tend to consider the physical layout or attractiveness of the website as the primary basis to determine its credibility.

Identifying helpful information in the article is not considered a challenge for the respondents. With the mean score of 3.40, it may be analyzed that the participants' facility in the English and Filipino languages aided them in the understanding of information that will answer the health concern. However, checking the information's accuracy seems to be a challenge for the participants. A low mean score of 1.43 in the particular task only dictates that the participants cannot verify the information even if assistance and cuing are given. From the abovementioned

observations, it is inferred that the students need further development of their health, information, media, and scientific literacies.

At the end of the OS, the participants were required to explain to the researcher the information gathered to address the health concern. With a mean score of 3.05, it is inferred that they are equipped in terms of comprehension and summarizing skills.

Actual eHealth Literacy

The results of the OS complement the reported perceived inefficiency of the respondents in applying their health and information skills. The general mean score of students in the OS is 29.13 ($n=40$), which translates to borderline intermediate to proficient eHealth literacy level. Unpacking the results further, students from private schools scored lower in the search and retrieval experiment ($M=28.85$, intermediate eHealth literacy) than those from public schools ($M=29.40$, proficient eHealth literacy). Figure 3 indicates the participants' actual eHealth literacy scores.

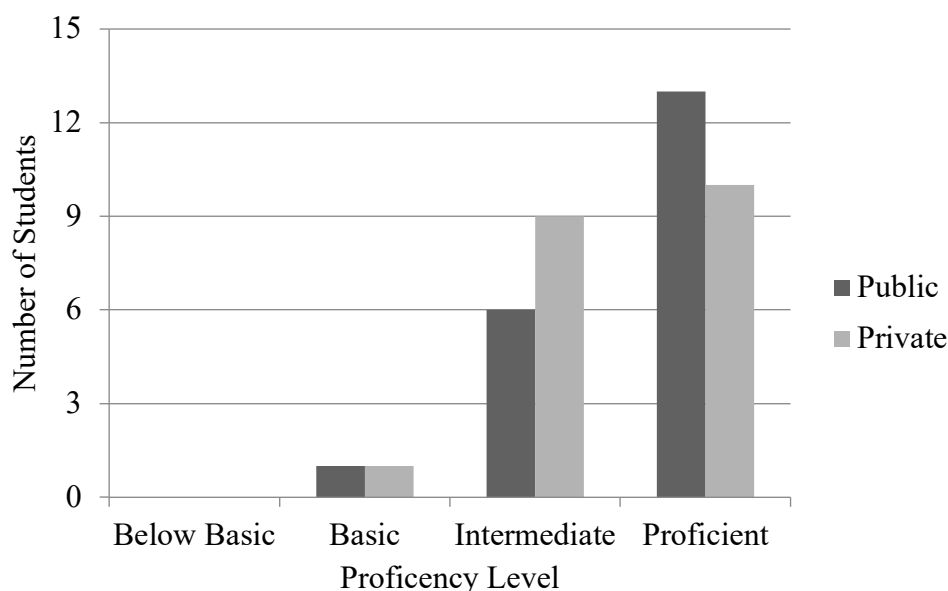


Figure 3: Actual eHealth literacy levels

Relationships among Variables Affecting eHealth Literacy

The chi-square test of independence also indicated that the actual eHealth literacy level does not depend on the school type, $X^2(2, N=40)=0.99$ with p -value of 0.61 at 95% confidence. However the results of the same test indicate that school type affects the perceived eHealth literacy level, $X^2(2, N=263)= 14.21$ with p -value of 0.00 at 95% confidence. Students from private schools tend to score their perceived eHealth literacy level higher than their counterparts in public schools.

Lastly, a paired samples t -test was administered to investigate if there is a significant difference between the perceived and actual eHealth literacy levels of the high school students. Results show that there is a significant difference between the two variables. The high school students rated their perceived eHealth literacy ($M=32.45$, $SD=6.10$, $N=40$) higher than their actual eHealth literacy ($M=29.13$, $SD=2.92$, $N=40$), $t(40)=4.16$, $p=0.000$ at 95% confidence.

Summary and Conclusion

This study aimed at describing the state of eHealth literacy of high school students in terms of their online health information-seeking behavior, strategies for search and retrieval of online health information, and criteria for evaluating online health information. It also intended to provide a quantitative description of the perceived and actual eHealth literacy of the students along with identifying their relationship with school type.

The high school students indicate high frequency of use of personal gadgets to search for online health information to maintain or improve their well-being. They prefer to use search engines as a starting point. They generally search for information about personal health, nutrition, and injury prevention, safety and first aid. Personal consumption was the main motivation for the online search. When asked for the general satisfaction, almost all participants provided an affirmative response.

The high school students' ability to evaluate the credibility of online sources of health information and the accuracy of health information in general is suboptimal. They tend to consider the layout of the website rather than its content. It may be concluded that the respondents have not mastered the curricular competencies covering these skills. It is in the national health curriculum of Grade 10 (p. 87) when evaluation of health information is tackled. It is essential to point that the participants of the study are Grade 10 students and the research was conducted during the 4th Quarter; this means that these competencies should have been learned by the students already.

The high school students perceive their eHealth literacy level higher than their actual ability. This finding implies that they may not have been given enough opportunities to practice their learning competencies on evaluation of health information and health information sources. Knowledge may have been imparted, but its actual application may be missing.

In summary, the high school students, though adept in terms of traditional and computer literacies, still need to further develop their scientific, media, information, and health literacy in order to effectively consume and apply online health information to maintain and/or improve their well-being.

Recommendations

It is recommended to conduct further research to investigate other influencing factors to eHealth literacy. A study on the impact of educators and other stakeholders in the development and enhancement of eHealth literacy is imperative to expounding on the emerging skill. It is also essential to develop and validate eHealth literacy measurement tools in the local language.

Since the findings of the study indicate absence/lack of the skill integration in the curriculum, reviews by program and curriculum planners must be initiated to incorporate the emerging concept especially in consumer health learning competencies. It is also necessary to reinforce consumer health instruction in schools through the educational policy-makers, administrators, and educators in order to strengthen the foundational skills of the students in terms of evaluating source credibility and content accuracy of health information gathered whether online or through other emerging forms of media. In terms of classroom assessment, review and enhancement of methods to evaluate consumer health skills must be proposed so that actual practice of such among students shall be evident and successful. If curricular inclusion may not

be possible, it can be recommended that school administration devises an eHealth literacy development program or module as supplementary instruction in regular classes.

Extending the utilization of the research results to the healthcare setting, medical personnel may use the data to enhance patient-professional relationship as the services are being rendered. Furthermore, the findings may also be key in the improvement of user interface of online sites that provide health information, products, and services.

References

- AlGhamdi, K. M. & Moussa, N. A. (2012, June). Internet use by the public to search for health-related information. *International Journal of Medical Informatics*, 81(6), 363–373. <https://doi.org/10.1016/j.ijmedinf.2011.12.004>.
- Baker, D. W. (2006). The meaning and the measure of health literacy. *Journal of General Internal Medicine*, 21(8), 878–883. <https://doi.org/10.1111/j.1525-1497.2006.00540.x>
- Bayani, O. (2014, Jun 25). Internet penetration doubles in PH, owed to mobile boom. *Marketing*. <http://www.marketing-interactive.com/internet-penetration-doubles-ph-owed-mobile-boom/>
- Bristol, N. M., Caro, J, J.D., Mangaliman, C.C., & Bernarte, R.P. (2016, February). The digital media consumption, dependency and its self-perceived effects on familiar and peer interpersonal relationships of the Filipino youth. *Asia Pacific Journal of Multidisciplinary Research*, 4(1), 91–98.
- Cendeña, P. (2017). Making sense of the complicated: Highlights of the 2015 National Youth Assessment Study [PowerPoint slides]. <http://yptoolbox.unescapsdd.org/wp-content/uploads/2017/08/National-Youth-Assessment-Study.pdf>
- Cresswell, J. W. & Plano Clark, V. (2007). *Designing and conducting mixed methods research*. Thousand Oaks, CA: Sage.
- Cutilli, C., & Benett, I. (2009). Understanding the health literacy of America results of the National Assessment of Adult Literacy. *Journal of Orthopaedic Nursing*. 28(1): 27–34. <https://doi.org/10.1097%2F01.NOR.0000345852.22122.d6>
- Department of Education. (2016). K-12 Health Curriculum Guide. <http://www.deped.gov.ph/sites/default/files/Health%20CG.pdf>.
- Eysenbach, G. & Kohler, C. (2002). How do consumers search for and appraise health information on the world wide web? Qualitative study using focus groups, usability tests, and in-depth interviews. *BMJ*, 321, 573–577. <https://doi.org/10.1136/bmj.324.7337.573>
- Fernando-Callo, L. (2009). Students' expressed health interest and parents' perceptions of their children's health needs (Unpublished masters thesis). University of the Philippines-Diliman, Quezon City.
- Fox, S. & Duggan, M. (2013). *Health online. Pew internet and American life project*. <http://pewinternet.org/Reports/2013/Health-online.aspx>
- Ghaddar, S. F., Valerio, M. A., Garcia, C. M., & Hansen, L. (2012, January). Adolescent health literacy: The importance of credible sources for online health information. *Journal of School Health*, 82(1), 28–36. <https://doi.org/10.1111/j.1746-1561.2011.00664.x>
- Gray, N. J., Klein, J. D., Noyce, P.R., Sesselberg, T. S., & Cantrill, J. A. (2005, April). Health information-seeking behaviour in adolescence: the place of the internet. *Social Science and Medicine*, 60(7), 1467–78. <https://doi.org/10.1016/j.socscimed.2004.08.010>
- Internet Live Stats. (2016, Jul 1). *Internet users*. <http://www.internetlivestats.com/internet-users/>
- Ivanitskaya, L., O'Boyle, I., & Casey, A. M. (2006). Health information literacy and competencies of information age students: Results from the interactive online research

- readiness self-assessment. *Journal of Medical Internet Research*, 8(2), e6.
<https://doi.org/10.2196/jmir.8.2.e6>
- Jimenez-Pernett, J., de Labry-Lima, A., Bermudez-Tamayo, C., Garcia-Gutierrez, J., & Salcedo-Sanchez, M. (2010). Use of the internet as a source of health information by Spanish adolescents. *BMC Medical Informatics and Decision Making*, 10(6).
<https://doi.org/10.1186/1472-6947-10-6>
- Jacobs, W., Amuta, A., & Kwon, C. (2017). Health information seeking in the digital age: An analysis of health information seeking behavior among US adults. *Cogent Social Sciences*, 3. <http://dx.doi.org/10.1080/23311886.2017.1302785>.
- Labucay, I. D. (2014). Patterns of internet usage in the Philippines. In J. D. James (ed.), *The internet and the google age: Prospects and perils* (pp. 27–49). Dublin: Research-publishing.net. <https://doi.org/10.14705/rpnet.2014.000176>
- Lenhart, A., Madden, M., & Hitlin, P. (2005 July 27). *Teens and technology: Youth are leading the transition to a fully wired and mobile nation*. Washington, D.C.: Pew Internet & American Life Project.
- Ma, J. & Latham, D. (2013). Interacting with health information for self-care: A pilot study exploring undergraduates' health information literacy. *iConference 2013 Proceedings* (pp. 793–796). <https://doi.org/10.9776/13390>
- Marazienė, D., Klumbienė, J., Tomkevičiūtė, J., & Misevičienė, I. (2012). Sources and reasons for seeking health information by Lithuanian adults. *Medicina (Kaunas)*, 48(7), 371–378. <https://doi.org/10.3390/medicina48070055>
- Norman, C. D., & Skinner, H. A. (2006a). eHEALS: The eHealth literacy scale. *Journal of Medical Internet Research*, 8(4), e27. <https://doi.org/10.2196/jmir.8.4.e27>
- Norman, C. D., & Skinner, H. A. (2006b, Jun 16). eHealth literacy: Essential skills for consumer health in a networked world. *Journal of Medical Internet Research*, 8(2), e9. <https://doi.org/10.2196/jmir.8.2.e9>
- On Device Research. (2014, Jul 8). The Philippines mobile internet crowd: Young, affluent, and growing [Blog post]. <https://ondeviceresearch.com/blog/philippines-mobile-internet-trends>
- Peltzer, K. & Pengpid, S. (2016). Health risk behaviour among in-school adolescents in the Philippines: Trends between 2003, 2007, and 2011, a cross-sectional study. *International Journal of Environmental Research and Public Health*, 13(1), 73. <https://dx.doi.org/10.3390%2Fijerph13010073>
- Philippine Statistics Authority. (2017). Philippines in figures 2017. http://psa.gov.ph/sites/default/files/PIF_2017.pdf
- Pleasant, A. (2009). Health literacy measurement: A brief review and proposal. In L. Hernandez (Ed.), *Measures of health literacy: Workshop summary* (pp. 17–22). Washington, D.C.: National Academy of Sciences.
- Seckin, G., Yeatts, D., Hughes, S., Hudson, C., & Bell, V. (2016, Jul 18). Being an informed consumer of health information and assessment of electronic health literacy in a national sample of Internet users: Validity and reliability of the e-HLS instrument. *Journal of Medical Internet Research*, 18(7), e161. <https://doi.org/10.2196/jmir.5496>
- TNS Political & Social. (2014). Flash Eurobarometer 404: European citizens' digital health literacy. European Union: Directorate-General for Education. <https://doi.org/10.2759/86596>

Corresponding author: Mark Kenneth S. Camiling

Contact email: mark.camiling@gmail.com

Comparative Study Between Traditional and Peer Assisted Learning of Business Management Students on Accounting Module

Siu Wo Tarloff Im
City University of Hong Kong, Hong Kong

Pit Ho Patrio Chiu
City University of Hong Kong, Hong Kong

Michelle Ng
City University of Hong Kong, Hong Kong

Abstract

Candidates who study business disciplines are trained to be all-round administrative staff to handle business-related issues. Knowledge of a basic accounting principle for supporting financial decisions is vital in business operations, and is especially crucial for managerial workers of a listed company. Indeed, the accounting module is one of the core modules for higher education students who are studying in business disciplines. With the College Heads' endorsement when departments joined the Peer-Assisted-Learning using Supplemental Instruction (PALSI) scheme, the academic results of two accounting modules were collected anonymously for research purposes.

The subject registration information shows that each cohort had at least 300 enrolments and, at most, over 800 enrolments. A review of academic results throughout four academic years was performed, the sample size of the study consisting of a total of 1,815 PALSI students and 5,869 non-PALSI students. This article focuses on the quantitative analysis in comparing the performance of PALSI students and non-PALSI students by monitoring their academic results consecutively in different cohorts. In this study, a t-test is implemented to evaluate the effectiveness of the peer-assisted learning scheme by identifying the academic results of each cohort to ascertain if there is a significant difference between the two groups.

Similar investigation on the effectiveness of the PALSI scheme with different accounting knowledge background before joining the undergraduate programmes is implemented in the latter part. The findings of the analysis provide remarkable academic enhancement for students with PALSI support, and it is concluded that the scheme is worth extending to different subjects in the business discipline in the future.

Keywords: peer-assisted learning, business, accounting, learning support, deep-learning

Introduction

In the past, Hong Kong Certificate of Education Examination (HKCEE) and Hong Kong Advanced Level of Education Examination (HKALE) candidates were prescribed to select science, business, and arts subjects in a specific combination for fulfilling the entry requirements of the undergraduate programmes in the previous 3-4-3 academic structure – 3 years junior secondary level; 4 years senior secondary level; 3 years undergraduate level. Even though such modules were available for students to enroll, only the minority of high school students had the opportunity to take subjects “Principles of Accounts” in HKCEE or HKALE (Hong Kong Examinations and Assessment Authority, 2018a).

Hong Kong Diploma of Secondary Examination

A new 3-3-4 academic structure includes three junior years plus three senior years in secondary education as well as preparing candidates to enroll in a four-year higher education journey. It was first implemented in 2012 to offer the Hong Kong Diploma of Secondary Examination (HKDSE). Therefore, professional subjects are likely to be taught at university level rather than providing training with limited time in senior secondary school life. The Hong Kong Examinations and Assessment Authority offers twenty-four senior secondary subjects, which are four core subjects and twenty elective subjects. HKDSE candidates are required to select elective subjects to form a study combination on top of the four core subjects - Chinese Language, English Language, Mathematics, and Liberal Studies.

After implementing the four-year curriculum in higher education, the constraint of selecting high school elective subjects was removed. Four core subjects plus one elective subject are the general university entry requirement for HKDSE candidates. Usually, there are no specific entry requirements for enrolling in programmes in the business discipline. By reviewing the registration records of the HKDSE examination of the last several years, it has been found that nearly 70% of the candidates have enrolled in four core subjects plus two elective subjects. Moreover, the accounting subject was not as popular as other elective subjects, that is, biology, chemistry, or economics.

Accounting modules enrolments of HKDSE. When HKDSE was officially launched in 2012, there were two subjects related to the accounting discipline. One of them was classified as a Category A Senior Secondary Subject – “Business, Accounting and Financial Studies” – and another one was classified as a Category B Applied Learning subject – “Practical Computerised Accounting” (Hong Kong Examinations and Assessment Authority, 2018b). By reviewing the data source of the Hong Kong Examinations and Assessment Authority (HKEAA), the statistics of the subjects’ enrolments were discovered. Table 1 shows that the number of candidates for the HKDSE entries in accounting and accounting-related subjects from 2012 to 2016 has been dropping continuously, from 17.7 percent to 15.2 percent. The figures conclude that the accounting subject was not as popular as other subjects in secondary students’ mindset after the implementation of the new HKDSE curriculum. Therefore, the number of students with accounting training before entering university was limited.

Table 1: HKDSE accounting subject enrolments from 2012 to 2017

Year	Business, Accounting and Financial Studies ⁺	Accounting ⁺⁺	HKDSE number of candidates	Percentage of Accounting students
2012	12,412		70,282	17.7%
2013	11,482		69,750	16.5%
2014	10,375		65,270	15.9%
2015		9,288	61,136	15.2%
2016		8,300	56,112	14.8%
2017		7,783	51,192	15.2%

Notes:

⁺The figures are the number of candidates take the elective part “Accounting Module”

⁺⁺After 2015, Business, Accounting and Financial Studies module was reformed into two subjects “Accounting” and “Business Management”

Entrance requirements for bachelor’s degree programmes. HKDSE candidates are responsible for checking the entrance requirements of each undergraduate programme when they are applying to study. For example, calculus knowledge is an essential tool for engineering students in science and engineering disciplines, where such specific pre-requisite for mathematics knowledge would be an advantage. However, HKDSE Mathematics extended parts Module 1 (M1) – “Calculus and Statistics” or Module 2 (M2) – “Algebra and Calculus” is not defined as one of the compulsory subjects in HKDSE level for enrolling into science or engineering disciplines.

In contrast, admission requirements of studying Bachelor of Business Administration programmes under the College of Business do not have a pre-requisite for accounting studies at the HKDSE level. In other words, there is no advantage for the students who have taken accounting as the HKDSE elective module to apply for the undergraduate programmes in the College of Business (City University of Hong Kong, 2018).

Accounting modules in undergraduate programmes at the College of Business. In the business world, accounting is a profession about managing financial accounts, auditing, and communicating amongst different stakeholders in financial terms. Accountants are required to possess basic accounting knowledge in designing appropriate business models or solving any financial difficulties of existing business operations. Thus, national institutes and professional bodies in various countries recognise such professional qualifications mutually in accounting.

It is common to find that Bachelor of Business Administration (BBA) students in the College of Business need to take the accounting discipline modules. BBA students are required to study either one or two modules related to accounting in the first two years of their study. As shown in Table 2 below, there are thirteen programmes which require undergraduates to take module CB2100 – “Introduction to Financial Accounting” in Year One. Ten of these programmes also require module CB2101 – “Introduction to Managerial Accounting” as one of the core modules in Year Two. Regardless of whether the students are going to select accounting as the major or the minor discipline of their undergraduate programme, the curriculum dictates these two subjects. Due to the high demands on these two accounting modules, both courses are usually

offered to two cohorts for each academic year by the Department of Accountancy to serve a large number of students from the College of Business.

Table 2: Study requirements for students in College of Business

Undergraduate programme	CB2100 - Introduction to Financial Accounting	CB2101 - Introduction to Managerial Accounting
BSc Computational Finance	Y	
BBA Global Business	Y	Y
BBA Accountancy	Y	Y
BBA Business Economics	Y	
BBA Finance	Y	Y
BBA Global Business Systems Management	Y	Y
BBA Information Management	Y	Y
BBA Management	Y	Y
BBA Business Analysis	Y	Y
BBA Business Operations Management	Y	Y
BBA Marketing	Y	Y
BBA Human Resources Management	Y	Y
BBA International Business	Y	

Although these modules are the introductory level for students enrolled in the business programmes, teaching staff might encounter difficulties in handling Year One candidates with different accounting knowledge during the semester. The objectives of our study are to identify the effectiveness of implementing the Peer Assisted Learning with Supplemental Instruction (PALSI) scheme to support learning for business modules, and recognise that the scheme is still favourable to learners with subject knowledge background of the module.

Literature Review

Traditionally, teachers usually use the teacher-centred approach in a classroom or a lecture theatre to deliver knowledge in the lessons of primary school, high school, or university. In recent years, there are lots of teaching and learning approaches to strengthen the learning supports for new undergraduates, such as blended-learning, e-Learning, and flipped classrooms. Educators started adopting the student-centred learning model, as they believe that the deep-learning process will happen through indirect knowledge transfer. However, some of these approaches might require teaching staff to redesign the course curriculum, apply new teaching strategies, or even plan alternative activities to implement different teaching and learning tasks. Eventually, faculty staff in universities are reluctant to attempt such a new teaching approach because the teaching effectiveness might be unremarkable.

In recent years, there have been lots of researchers evaluating their learning performances in various disciplines, such as medical study (Burgess, McGregor, & Mellis, 2014; Herrmann-Werner et al., 2017), nursing study (McLelland, McKenna, & French, 2013; Williams, Olausson, & Peterson, 2015; Williams & Reddy, 2016), radiography (Meertens, 2016), biology (Rayner & Papakonstantinou, 2018), geography (West, Jenkins, & Hill, 2017), mathematics (Duah, Croft, & Inglis, 2014), accounting (Marrone & Draganov, 2016; Sudhakar, Tyler, &

Wakefield, 2016; Supple, Best, & Pearce, 2016), mechanical engineering (Qonda, 2017) and other challenging subjects of undergraduate programmes. However, not many longitudinal studies have been conducted on the subjects in business disciplines with Peer Assisted Learning support.

Studies have been done to investigate the effectiveness of peer-assisted learning, and researchers conclude that academic mean scores are increased by comparison with groups without peer-assisted learning support (Riaz, 2014; Bennett, Morris, & Mirza, 2018). Moreover, Williams and Reddy (2016) state that the academic enhancement of student tutors is most significant.

In the light of this literature, this paper attempts to extend the study on peer-assisted learning support from science and engineering subjects to modules in business disciplines, and prove the academic performance of the PALSIs group is enhanced effectively. The statistical t-test was implemented by comparing the academic mean results of the PALSIs and non-PALSIs groups in this longitudinal study. Moreover, this study would like to highlight that the peer-assisted learning scheme is not only for helping mid-range students, but also for boosting the performance of top-tier students.

Methodology

The PALSIs course nomination form was sent to the College Heads seeking their endorsement to follow the PALSIs guidelines before each semester started. The colleges and departments agreed that the academic results of the PALSIs courses would be collected anonymously for research purposes, and such a statement was written on the PALSIs course nomination form. During the orientation sessions, an acknowledgement about performance comparison was made to the students who wished to join the PALSIs scheme. The anonymous analysis was to investigate the effectiveness of joining the PALSIs scheme in each module. At the end of the academic year, all these findings were to be compiled into a PALSIs report and sent back to the corresponding departments for reviewing the scheme on different modules.

Statistical tables and charts were compiled to present the academic performance mean value descriptively with different cohorts. After that, a t-test would be implemented to evaluate the effectiveness of peer-assisted learning between the PALSIs and non-PALSIs students. Interesting findings on the academic performance were revealed by comparing the Grade Point Average (GPA) mean value of PALSIs and non-PALSIs students. A similar study on the academic results related to the PALSIs scheme on undergraduate mathematics modules has been done before (Im, Chiu, Shek, & Liu, 2017). The previous performance study was also divided into two groups based on whether they had advanced mathematics training or without advanced mathematics training before the undergraduate study.

Data Analysis

With collecting the academic results of four academic years, the sample size of the PALSIs students and non-PALSIs students are 1,815 and 5,869, respectively. Also, for each cohort, there were at least 300 enrolments to over 800 enrolments. To study the learning effectiveness of students who have joined the PALSIs scheme, we list the grade distribution summary to obtain an overview of the academic performance. In Table 3 referring to CB2100, it shows that the number of PALSIs students in “A range” is nearly the same as the number of non-PALSIs

students in “A range” in most of the cohorts. For 2015-16 Semester B, it finds that over half of the “A Range” students have joined PALSI.

In another module CB2101, Table 4 shows that PALSI students are not the majority of the “A range” students; only a few cohorts of PALSI students are dominant in the “A Range”. However, similar findings on the relationship between the percentage of “A Range” students and the percentage of PALSI students conclude that they are correlated positively. Two charts – Figure 1 and Figure 2 are created to visualize the relationship of the “A Range” students and the PALSI students for different cohorts of CB2100 – Introduction to Financial Accounting and CB2101 – Introduction to Managerial Accounting.

Table 3: Grades distribution for eight cohorts of CB2100

Year/Cohort	PALSI	Grades										
		A+	A	A-	B+	B	B-	C+	C	C-	D	F
2014-15 Semester A	Y	5	11	15	19	19	17	14	7	5	3	20
	N	3	16	27	43	49	41	37	36	28	12	63
2014-15 Semester B	Y	16	13	15	24	21	15	11	8	6	0	4
	N	28	13	37	52	38	53	33	25	19	13	39
2015-16 Semester A	Y	11	10	19	34	38	25	17	11	12	2	9
	N	7	18	22	47	36	37	42	21	16	12	35
2015-16 Semester B	Y	30	18	22	30	36	19	21	5	3	1	2
	N	15	17	31	57	51	44	43	30	5	1	19
2016-17 Semester A	Y	10	10	23	35	19	13	7	7	3	1	12
	N	9	25	26	38	42	41	23	21	13	8	37
2016-17 Semester B	Y	4	12	12	25	35	16	6	5	0	1	5
	N	12	21	34	45	65	50	29	16	8	8	42
2017-18 Semester A	Y	9	11	10	9	31	16	10	1	3	1	6
	N	50	26	21	33	57	48	30	11	9	6	29
2017-18 Semester B	Y	5	16	15	21	33	14	11	2	3	1	6
	N	21	42	34	39	90	58	52	28	14	1	48

Table 4: Grades distribution for seven cohorts of CB2101

Year/Cohort	PALSI	Grades										
		A+	A	A-	B+	B	B-	C+	C	C-	D	F
2014-15 Semester A	Y	0	2	4	2	2	7	9	2	0	1	0
	N	14	28	42	43	73	49	19	18	13	9	11
2015-16 Semester A	Y	19	23	16	27	30	22	14	11	6	1	4
	N	35	59	48	51	68	78	37	27	24	2	25
2015-16 Semester B	Y	1	8	8	12	11	10	8	2	0	0	2
	N	23	35	56	81	72	53	36	18	6	9	22
2016-17 Semester A	Y	23	31	31	46	42	22	11	7	0	1	8
	N	43	74	86	123	97	97	75	31	8	4	39
2016-17 Semester B	Y	6	5	5	5	1	3	2	0	1	0	3
	N	26	32	58	73	62	51	28	13	9	5	21
2017-18 Semester A	Y	25	21	20	26	26	3	2	2	2	0	1
	N	43	66	70	105	126	56	45	18	23	8	25
2017-18 Semester B	Y	7	7	2	7	2	2	1	0	1	2	1
	N	29	45	68	63	36	41	34	20	8	9	21

Descriptive Statistics Information about Studies with “A Range” Students

In Figure 1, it shows that in seven out of eight cohorts PALSI students had a higher percentage in “A Range” students than non-PALSI students for CB2100. In most of the cohorts, the PALSI group has at least 5% more than the non-PALSI group with such substantial differences. Similarly, Figure 2 shows that CB2101 has five out of seven cohorts PALSI students with the percentage of the “A Range” students higher than the non-PALSI students. All the cohorts of the PALSI students having “A Range” results are over 20%, and three cohorts are significantly as high as 50%.

According to these two figures, it draws our attention that PALSI students’ contribution to “A Range” is far more than the percentage than a normal distribution should have. Although not all the cohorts were consistent to draw the same conclusion, it is believed that students who had joined the PALSI scheme were aimed high and capable of achieving excellent academic performance.

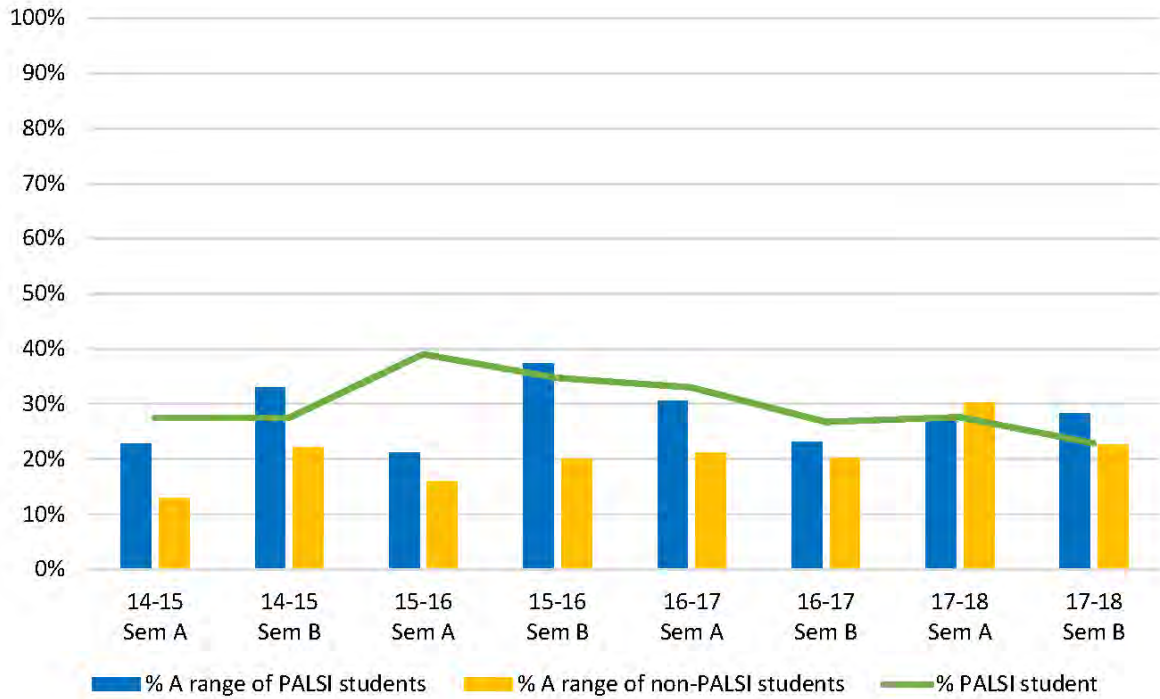


Figure 1: CB2100 – “A Range” percentage of PALSIs students and non-PALSIs students

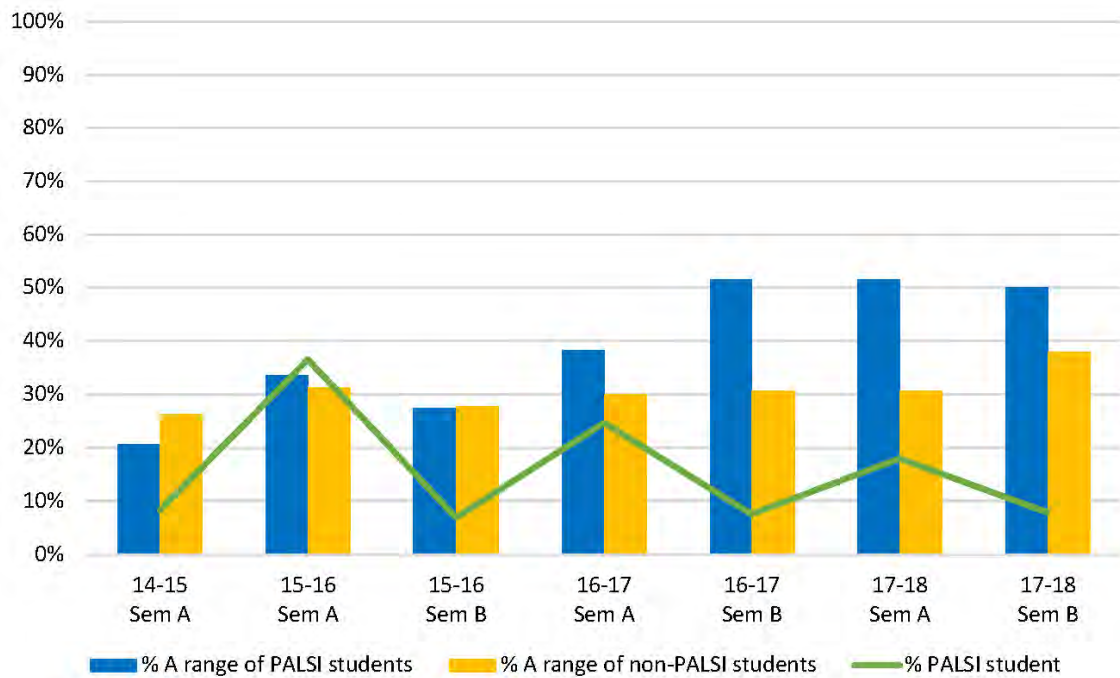


Figure 2: CB2101 – “A Range” percentage of PALSIs students and non-PALSIs students

Findings with t-test on PALSIs and Non-PALSIs Students’ Performance

The academic results are collected from 2014-15 to 2017-18, and the data include a total of eight cohorts in CB2100 and seven cohorts in CB2101. In general, the data of different grades would follow the normal distribution, and only the top tier percentile part represents “A Range”

performance. Nevertheless, the academic performances of PALS I students of both modules have formed skewed distribution with a higher mean value than the normal distribution from previous observations. Further analyses for in-depth inferential statistical t-test are conducted to investigate whether there is a significant difference in the GPA mean values of these two groups. Relevant data of both modules are shown in Table 5 and Table 6 as below.

The performances are analysed by comparing their GPA mean values with the SPSS statistical package (IBM) to show the mean difference. The p-values of the t-test for PALS I and non-PALS I students found that all eight cohorts of CB2100 are $<.05$, which represent their means of these two groups are different with statistically significant results. In another module CB2101, three cohorts have p-values $<.05$, and it is noted that those cohorts with p-values $>.05$ are relatively low PALS I enrolment numbers.

Table 5: Inferential statistics for studying CB2100

Year / Cohort	PALS I			Non-PALS I			p-value
	Mean	N	SD	Mean	N	SD	
2014-15 Semester A	2.55	135	1.27	2.23	355	1.25	.013*
2014-15 Semester B	3.09	133	0.91	2.60	350	1.21	<.001*
2015-16 Semester A	2.85	188	0.95	2.47	293	1.17	<.001*
2015-16 Semester B	3.11	167	0.74	2.80	313	0.96	<.001*
2016-17 Semester A	2.94	140	1.10	2.55	283	1.22	.002*
2016-17 Semester B	3.02	121	0.84	2.61	330	1.19	.001*
2017-18 Semester A	2.96	107	0.98	2.67	280	1.13	.02*
2017-18 Semester B	3.01	127	0.91	2.67	427	1.16	.002*

Note: * $p < .05$ statistically significant

Table 6: Inferential statistics for studying CB2101

Year / Cohort	PALS I			Non-PALS I			p-value
	Mean	N	SD	Mean	N	SD	
2014-15 Semester A	2.76	29	0.69	2.92	319	0.91	.35
2015-16 Semester A	3.10	173	0.88	2.93	454	1.02	.05*
2015-16 Semester B	3.03	62	0.80	2.95	411	0.98	.51
2016-17 Semester A	3.22	222	0.87	2.97	677	0.99	.001*
2016-17 Semester B	3.17	31	1.25	2.99	378	0.99	.34
2017-18 Semester A	3.51	128	0.67	3.03	585	0.95	<.001*
2017-18 Semester B	3.31	32	1.09	3.00	374	1.05	.11

Note: * $p < .05$ statistically significant

Results and Discussion

In general, the p-values of both modules support that there is a difference in the academic performance of the PALS I group and non-PALS I group. In other words, students who have joined the PALS I scheme could attain better performance in the accounting modules, after

analysing the academic results with a series of the cohort. As mentioned in the former part, HKDSE graduates might have taken the “Accounting” subject when they were studying in senior secondary school. According to the information provided by the Academic Regulations and Records Office (ARRO), only their previous accounting knowledge in HKDSE of the PALS I students could be identified. Thus, Table 7 shows the percentage of PALS I students who have enrolled in HKDSE “Accounting” subject; the results show that around one-third of them had accounting knowledge before the undergraduate studies. In the light of that, another set of paired t-tests were run to investigate any performance advantages for PALS I students with previous accounting qualification background.

Table 7: PALS I enrolments details from 2014 to 2017

Year	No. of students enrolled in PALS I	No. of PALS I students enrolled in HKDSE Accounting subject	% of all PALS I students enrolled in HKDSE Accounting subject
2014	297	93	31.3%
2015	590	184	31.2%
2016	514	178	34.6%
2017	394	107	27.2%

The endorsement form for joining the PALS I scheme signed from the colleges and the departments allowed us to collect academic results anonymously to perform data analysis for the research purpose. Therefore, we are able to access the study background of PALS I students. However, for those who did not participate in the PALS I scheme, the study background of non-PALS I students could not be analysed.

PALS I students’ performance of each module is further categorized into two smaller groups based on their prior accounting experience. In Table 8 and Table 9, the two groups are named “HKDSE accounting = YES” and “HKDSE accounting = NO”, with a t-test on the mean values comparisons.

Table 8: Comparison with different accounting background of CB2100 PALS I students

Year	HKDSE accounting=YES			HKDSE accounting=NO			p-value
	Mean	N	SD	Mean	N	SD	
2014-15 Semester A	2.98	39	1.00	2.38	96	1.33	.012*
2014-15 Semester B	3.46	47	0.77	2.88	86	0.92	<.001*
2015-16 Semester A	3.06	50	0.87	2.77	138	0.96	.065
2015-16 Semester B	3.32	56	0.76	3.00	111	0.71	.009*
2016-17 Semester A	3.34	52	0.75	2.71	88	1.21	.001*
2016-17 Semester B	3.38	25	0.57	2.92	96	0.88	.02*
2017-18 Semester A	3.16	30	0.54	2.88	77	1.10	.18
2017-18 Semester B	3.40	23	0.48	2.93	104	0.97	.02*

Note: * $p < .05$ statistically significant

Table 9: Comparison with different accounting background of CB2101 PALSİ students

Year	Advanced accounting=YES			Advanced accounting=NO			p-value
	Mean	N	SD	Mean	N	SD	
2014-15 Semester A	2.43	7	0.84	2.86	22	0.63	0.15
2015-16 Semester A	3.29	62	0.75	3.00	111	0.93	.04*
2015-16 Semester B	3.12	16	0.54	3.00	46	0.88	.62
2016-17 Semester A	3.47	86	0.58	3.06	136	0.99	.001*
2016-17 Semester B	3.06	15	1.45	3.27	16	1.08	.65
2017-18 Semester A	3.43	42	0.58	3.55	86	0.72	.34
2017-18 Semester B	3.60	12	0.95	3.15	20	1.16	.27

Note: * $p < .05$ statistically significant

From the analysis of the PALSİ students' performance, both accounting modules with a large number of PALSİ enrolments show that at least one sub-grade improvement is achieved. The continuous study on different cohorts in four academic years – eight semesters proves that the PALSİ scheme contributes substantial enhancements in the academic performance of accounting disciplines. Those findings also provide supportive evidence that the PALSİ scheme is not solely for “high-risk” modules of the engineering undergraduate programmes (Im et al., 2017). Students with accounting training before are also interested in joining the PALSİ scheme in order to achieve higher academic performance.

Conclusions

In the City University of Hong Kong, the Peer Assisted Learning (PAL) scheme has been implemented to support learning for those most challenging “high risk” subjects of undergraduate candidates. Especially in various subjects of engineering and science disciplines, the peer group learning approach has ensured that the learner-centered approach could enhance the learning experience.

In this study, the accounting modules of the College of Business were selected to evaluate academic performance. These core modules of thirteen undergraduate programmes provide nearly two thousand quotas for every academic year. The PALSİ scheme was introduced to junior year students to provide extensive teaching and learning support. Such peer-to-peer support opportunities have engaged students more interactively through the small class-size teaching mode.

Topping and Ehly (1998) state that collaborative learning experience is constructed through a series of the understanding process – questioning, answering, discussing, clarifying, giving examples, and receiving feedback. More interactive discussions during peer-assisted learning sessions could offer additional opportunities to develop metacognition, which are different from traditional tutoring sessions in higher education (Vygotsky, 1978). Peer tutoring with supplemental instruction not only encourages students to be engaged in group discussions but also turns them from passive listeners to active learners in collaborative learning. Researchers have studied the different perspectives about education learning, Marton and Säljö (1976a, 1976b) point out that there are two kinds of learning development processes, which are “surface-level processing” and “deep-level processing”.

The findings from this longitudinal study in accounting modules show that increasing the time given to accounting topics with the learner-centred approach can eventually help to enhance the study performance. Although scaffolding the knowledge through peer learning could achieve a good learning experience, it might require regular meeting schedules with an adequate attendance rate. Therefore, further studies on the relationship in attendance records and academic performance would be our future analysis direction.

References

- Bennett, S. R., Morris, S. R., & Mirza, S. (2018). Medical students teaching medical students surgical skills: The benefits of peer-assisted learning. *Journal of Surgical Education*, 75(6), 1471–1474. <https://doi.org/https://doi.org/10.1016/j.jsurg.2018.03.011>
- Burgess, A., McGregor, D., & Mellis, C. (2014). Medical students as peer tutors: a systematic review. *BMC Medical Education*, 14(1), 115. <https://doi.org/10.1186/1472-6920-14-115>
- City University of Hong Kong. (2018, December 19). *Bachelor's Degree Programmes | Undergraduate Admissions*. <https://www.admo.cityu.edu.hk/jupas/entreq/bd>
- Duah, F., Croft, T., & Inglis, M. (2014). Can peer assisted learning be effective in undergraduate mathematics? *International Journal of Mathematical Education in Science and Technology*, 45(4), 552–565. <https://doi.org/10.1080/0020739X.2013.855329>
- Herrmann-Werner, A., Gramer, R., Erschens, R., Nikendei, C., Wosnik, A., Griewatz, J., ... Junne, F. (2017). Peer-assisted learning (PAL) im medizinischen Grundstudium: eine Übersicht. *Zeitschrift Fur Evidenz, Fortbildung Und Qualitat Im Gesundheitswesen*, 121, 74–81. <https://doi.org/10.1016/j.zefq.2017.01.001>
- Hong Kong Examinations and Assessment Authority. (2018a, December 20). *Development of Public Exams in Hong Kong*. http://www.hkeaa.edu.hk/en/recognition/develop_hk_pub_exam/
- Hong Kong Examinations and Assessment Authority. (2018b, December 20). *Subject Information*. http://www.hkeaa.edu.hk/en/hkdse/assessment/subject_information/
- Im, S. W. T., Chiu, P. H. P., Shek, C. H., & Liu, D. Y. W. (2017). Performance evaluation of college of science and engineering students with the PALSI scheme. *International Journal of Science, Mathematics and Technology Learning*, 24(1), 27–34. <https://doi.org/10.18848/2327-7971/CGP/v24i01/27-34>
- Marrone, M., & Draganov, L. (2016). Peer assisted learning: Strategies to increase student attendance and student success in accounting. In L. N. Wood & Y. A. Breyer (Eds.), *Success in higher education: Transitions to, within and from university* (pp. 149–165). <https://doi.org/10.1007/978-981-10-2791-8>
- Marton, F., & Säljö, R. (1976a). On qualitative differences in learning: I - Outcome and process. *British Journal of Educational Psychology*, 46(1), 4–11. <https://doi.org/10.1111/j.2044-8279.1976.tb02980.x>
- Marton, F., & Säljö, R. (1976b). On qualitative differences in learning — II Outcome as a function of the learner's conception of the task. *British Journal of Educational Psychology*, 46(2), 115–127. <https://doi.org/10.1111/j.2044-8279.1976.tb02304.x>
- McLelland, G., McKenna, L., & French, J. (2013). Crossing professional barriers with peer-assisted learning: Undergraduate midwifery students teaching undergraduate paramedic students. *Nurse Education Today*, 33(7), 724–728. <https://doi.org/10.1016/j.nedt.2012.10.016>
- Meertens, R. (2016). Utilisation of a peer assisted learning scheme in an undergraduate diagnostic radiography module. *Radiography*, 22(1), e69–e74. <https://doi.org/10.1016/j.radi.2015.08.004>

- Qonda, M. (2017). Peer-assisted learning programme: Supporting students in high-risk subjects at the mechanical engineering department at Walter Sisulu University. *Journal of Student Affairs in Africa*, 5(2), 17–31. <https://doi.org/10.24085/jsaa.v5i2.2700>
- Rayner, G., & Papakonstantinou, T. (2018). The use of peer-assisted learning to enhance foundation biology students' understanding of evolution. *International Journal of Innovation in Science and Mathematics Education*, 26(3), 65–77.
- Riaz, I. (2014). Peer assisted versus expert assisted learning: A comparison of effectiveness in terms of academic scores. *Journal of the College of Physicians and Surgeons--Pakistan : JCPSP*, 24(11), 825–829. <https://doi.org/11.2014/JCPSP.825829>
- Sudhakar, A., Tyler, J., & Wakefield, J. (2016). Enhancing student experience and performance through peer-assisted learning. *Issues in Accounting Education*, 31(3), 321–336. <https://doi.org/10.2308/iace-51249>
- Supple, B., Best, G., & Pearce, A. (2016). “My purpose was to help them with accounting, not English”: An exploratory study of languages other than English in peer assisted study sessions. *Journal of Peer Learning*, 9, 49–65. <https://ro.uow.edu.au/ajpl/vol9/iss1/6>
- Topping, K. J., & Ehly, S. W. (1998). Introduction to peer-assisted learning. In *Peer-assisted learning* (pp. 1–23). Mahwah, N.J.: Routledge.
- Vygotsky, L. (1978). *Mind in society : the development of higher psychological processes*. M. Cole (Ed.). Cambridge, Mass: Harvard University Press.
- West, H., Jenkins, R., & Hill, J. (2017). Becoming an effective peer assisted learning (PAL) leader. *Journal of Geography in Higher Education*, 41(3), 459–465. <https://doi.org/10.1080/03098265.2017.1315384>
- Williams, B., Olausson, A., & Peterson, E. L. (2015). Peer-assisted teaching: An interventional study. *Nurse Education in Practice*, 15(4), 293–298. <https://doi.org/10.1016/j.nepr.2015.03.008>
- Williams, B., & Reddy, P. (2016). Does peer-assisted learning improve academic performance? A scoping review. *Nurse Education Today*, 42, 23–29. <https://doi.org/10.1016/j.nedt.2016.03.024>

Corresponding author: Siu Wo Tarloff Im

Contact email: sw.im@cityu.edu.hk

Evaluation of Self and Peer Assessments in a Second Year Engineering Module

David Hassell
University of Bath, United Kingdom

Kok Yueh Lee
Universiti Teknologi Brunei, Brunei Darussalam

Abstract

This paper evaluates the use of peer and self-assessments as part of the learning process of an open ended, essay-based course in a second-year degree engineering module in Brunei Darussalam. The essays were marked using a rubric by the student, a peer, and the lecturer, with students being pre-trained on the use of the rubric prior to the exercise. Comparison of the marks awarded by the different markers (student, peer, lecturer) showed that whilst there might be correlations between different markers (i.e. peer - self; or lecturer - self) for marks on certain sub-sections of the work, there was no overall correlation between marks for this open ended problem. This lack of consistency highlights the subjective nature of marking essay-based work, even with the use of a rubric. Feedback on the students' experiences was obtained using a questionnaire, and most students felt that the peer assessment exercise was a worthwhile activity which aided both their learning and students' motivation to learn. Analysis of student performance in the exam, after the exercise, identified that almost all students did better in the question linked to the exercise than in others, further reinforcing this student view. The poor mark concordance in this study indicates that both techniques are not suitable to quantitatively evaluate student performance, however they had a positive impact on student learning. It is recommended that this approach is incorporated in other open-ended assessments as a form of formative feedback with the provision of adequate tutor and student preparation.

Keywords: peer-assessment; self-assessment; rubrics; engineering; student experience; higher education

Higher Educational institutions increasingly view assessment within curriculum as methods for learning rather than methods of measuring learning. Within the former, student, peer and self-assessment and the use of rubrics are favourably supported and encouraged in higher education (Falchikov, 2003, 2005; Hanrahan & Isaacs, 2001) and are a useful technique for the evaluation of student performance and focal point for self-reflection. Asikainen, Virtanen, Postareff, and Heino (2014) have suggested that long-term pedagogical training is not the only way to develop university teaching and learning, and that the application of rubrics and peer assessment can be an effective teacher-focused approach to improve student learning. However, Liu and Carless (2006) have indicated that there is resistance to this shift from lecturer assessment to peer assessment by both staff and students for reasons such as the reliability and fairness of peer assessment and the increasing the workload of lecturers as the peer marks would have to be collated. Contextual factors such as students and lecturers in Hong Kong perceiving assessment as the lecturer's duty and students believing that lecturers are more knowledgeable in assessing. To mitigate student reluctance, Sendziuk (2010) proposed lecturers deliver written feedback and not award grades in assignments to ensure students would value the feedback. Other approaches include involving students in creating the assessment criteria, the emphasis being the process of learning instead of performance.

Previous literature within engineering has focused on assessment of numerically based questions or problems (Davey, 2011), or student presentations (Montalvão & Baker, 2015), and there is little research on the application of self and peer assessments using rubrics in complex problem-based essays. This paper presents an evaluation of the use of peer and self-assessments using rubrics as part of the learning process for essay based open-ended coursework in a module studied in year two of an engineering degree. The work investigates the effectiveness of the peer-to-peer marking in accurately capturing the final student mark when compared to lecturer marks, and investigates the impact of this assessment process on student experience and learning.

The aims of this study were to:

1. Assess the capacity of engineering students to grade their own work and other students work when provided with suitable training and a rubric marking scheme.
2. Determine the statistical correlation and concordance between the students' peer and self-assessed marks and that of the lecturer.
3. Identify whether students valued this type of active self and peer assessment exercise and in what ways they found it effective/ineffective using an anonymous and voluntary established survey.
4. Identify any differences in performance and perception of the exercise based on course of study.

Literature Review

Self-assessment refers to the assessment exercise where students evaluate their own work in relation to their performance and ability or achievements (Andrade, 2010; Andrade & Boulay, 2003; Andrade & Valtcheva, 2009). It has been reported by Andrade (2010) that it enhances learning and achievement and aims to provide informative feedback on students' achievements in order to improve their abilities. In a similar manner, Nicol, Thomson, and Breslin (2014) describe peer-assessment as a classroom exercise whereby students take on the role as the assessor to evaluate their peer's work, either in the form of scoring, grading or through feedback. Arendt, Trego, and Allred (2016) stated that involving students in their own

assessment has been shown to improve students' performance if implanted effectively while Boud (1995) reported that both assessments engage students to be active participants in their own learning.

Whilst some researchers such as Montalvão and Baker (2015) applied peer-assessment without rubrics in what they described as a “holistic approach”, in general it is more common to provide students with a marking rubric when applying peer and self-assessment. There is a large amount of literature available outlining the use of rubrics over a wide range of disciplines and academic levels (see for instance, Andrade, 2000; Andrade, Du, & Wang, 2008; Cho, Schunn, & Wilson, 2006; Moni & Moni, 2008; Tierney & Simon, 2004). Whilst there are still instances such as those reported by Reyna and Meier (2018) where inadequate rubrics are used, the benefits of using rubrics in educational contexts have been reported by Andrade (2000, 2005), Andrade and Du (2005), and Reddy and Andrade (2010) to be of help to students to comprehend tutor's expectations, understand the specific intended learning outcomes of the assignment or task, as well as providing feedback to students indicating their strengths and weaknesses.

Using rubrics during summative assessment poses multiple challenges for the lecturer, including rubric reliability and validity (Andrade, 2005) and rater reliability (Moskal & Leydens, 2000). Work by Cho et al. (2006) looked at the reliability of peer review and found that it requires multiple peer assessors to be reliable. When evaluating the reliability of students to accurately capture their performance in comparison to that of their lecturer, there are conflicting results reported within the literature. A recent review of literature (Brookhart, 2018) reported that most literature claims a high inter-rater reliability, however the criteria for these claims are variable and whilst some studies report high correlation between lecturer and student marking (see for instance, Freeman, 1995; Fry, 1990; Longhurst & Norton, 1997; Oldfield & Macalpine, 1995; Orpen, 1982) there are others that acknowledge low correlation (see for instance, Kwan & Leung, 1996; Rushton, 1993). Low correlation suggests that lecturers and students have different interpretations towards the criteria set out in the rubrics indicating that rubrics can be rather subjective. Both Andrade (2000), and Jonsson and Svingby (2007) have stated that a careful and well-designed rubric can promote students' learning, enhancing the teaching and learning process whilst stimulating thinking processes. However other studies have found no direct effect of rubrics on student performance (Tobajas, Molina, Quintanilla, Alonso-Morales, & Casas, 2019) and to adequately capture the development of student learning, rubric validity is important, with minimal student mark sensitivity based on the assessor. The lecturer also has to have a well-defined and transparent understanding and definition of what is required, with Rezaei and Lovorn (2010) reporting that they also need to be well-trained when it comes to designing and implementing rubrics.

Within the field of engineering, Davey (2011) and Davey and Palmer (2012) found average marks awarded by assessor and assessee using rubrics were similar, although a closer look at the results indicate considerable scatter. Later work by Davey (2015) reported that students undertaking self-assessment of a mid-term test marked their work on average 16% higher than the tutor did. The main differences were observed in only two of the five questions, and indicates that rater reliability is a consequence of the type of question posed as well as any training raters receive. Recently work has been presented arguing that peer assessment can provide similar marking to the lecturer (Rodgers, 2019), however the considerable scatter in the results again indicate a danger when interpreting student marks through statistics. These seemingly conflicting findings illustrate the challenges faced when implementing rubrics and the use of peer and self-assessments into the evaluation of student learning.

Apart from assisting in the evaluation of students' performances, rubrics can also be used for self and peer assessments as part of formative assessment. Nagori and Cooper (2014) have outlined the usefulness of these techniques for formative assessment, where students are partial assessors of their own work. In this, the emphasis is on the learning attainment rather than scores or grades where the peer and self-assessments allow students to be judges of their own work as well as of their peers. Whilst studies such as that presented by De Grez, Valcke, and Roozen (2012) and Davey (2015) have reported students expressing a positive opinion on the experience, there are limited studies providing evidence of the approach leading to improved performance in subsequent assessments.

Methodology

Participants

Participants were from a Petroleum Engineering Bachelor's degree (38 students) and Foundation degree in Process Engineering (58 students) who were all studying the same module. The participants were selected based on convenience sampling as the students would have undergone multiple assessment methods and were familiar with peer and self-assessment exercises. The entry requirements of the students entering these two courses is different: Foundation degree D, D in A-level mathematics and physics/chemistry; Petroleum Engineering B, B, C in A-level mathematics, physics and chemistry. In both cohorts, almost all students were nationals of Brunei Darussalam, with just one or two foreign students from Malaysia. All 96 participants volunteered to take part in the study and were allowed to withdraw from the study at any time without any negative implications. Ethical considerations to protect students' rights included completing an anonymised questionnaire and assessing their peers anonymously.

Research Context

This study was carried out on a piece of coursework in a second-year engineering module, Petroleum Refining, which consisted of 56 hours of content time between the lecturer and students over 14 weeks.

The coursework to be assessed was handed out to the students at the beginning of the semester and took the form of a 600 word essay worth 10% of the final grade. The task involved describing the various factors to be considered when locating an oil refinery. The coursework handout is provided in Appendix A. The students were provided with six weeks in which to complete their work and once the students had finished the course, they were provided with a set of rubrics to evaluate their work. At the end of the module students undertook an exam which was worth 70% of the total marks. As part of the exam, one section worth 15% evaluated students' understanding of the topics covered in the assignment, and this was used in part to evaluate the students' retention of information relevant to the assignment.

Procedure

Both Jonsson and Svingby (2007), and Reddy and Andrade (2010) have indicated that student use of a rubric must include an element of training for the student to understand its implementation. In this study, students were given a half hour oral presentation and demonstration prior to implementation of the rubric for self and peer assessments. The students were then given one hour to mark two pieces of work using the rubric, their own (self-assessment) and that of one other student (peer assessment). For expediency, peer assessment was facilitated by students collecting work from the front of the lecture hall, with each piece of work being assessed by oneself and one peer marker. The reviewing process was

anonymised (no assessor names) and as a result students were unaware of who assessed their work. Whilst grading of work was mandatory, the provision of written feedback was made optional, and marking by the lecturer took place subsequent to this activity. The total process took approximately two hours to complete, and was undertaken during a normal lecture period for the module. The self and peer assessment marks, whilst provided to the students, did not contribute to the overall mark of the module.

Of the 96 students from both cohorts, 59 participated in the self and peer assessment tasks (a response rate of 62%) and 65 students took part in completing the questionnaire (a response rate of 68%). Six students did not complete the assessment forms. This highlights one limitation of the voluntary nature of the work, with students choosing whether to attend the session and submit their assessment for evaluation.

Rubric

A set of descriptive rubrics was distributed to students. The rubric included specific points that should have been made in the coursework, and is provided in Appendix B, along with the list of points used during assessment. Whilst it is normally the case that rubrics are handed out with the assessment, they were not provided in this case as elements of the rubric included specific answers which would undermine the assessment purpose. These points were included to facilitate more accurate marking with the intention of reducing subjectivity caused by variable markers. After marking, students were asked to return the assessment rubric to the lecturer for subsequent evaluation, and the lecturer marked all coursework with these marks contributing towards the final student mark for the module. These marks were then compared with the results of self and peer assessment. Upon analysis it was found that some data were missing. Not all peer and self-assessment forms were submitted and there were six omissions (all from Petroleum Engineering). This highlights that more attention should have been taken by the academic staff when receiving the assessment forms, and as a result there were slightly more questionnaire responses than there were complete self and peer assessment pairs, with a summary provided in Table 1.

Questionnaire

This study implemented a mixed methods approach for data collection and analysis. Data was collected using both quantitative and qualitative methods. Once the assessment process was finished, students were asked to complete an anonymised questionnaire seeking information to investigate students' experiences of and attitudes towards rubrics and peer assessment. The questionnaire is provided in Appendix C and comprised 21 statements of fixed-response type rating their agreement using a seven-point Likert scale (Likert, 1932). Ratings ranged from Strongly Agree to Strongly Disagree. The questionnaire focused on students' perception of peer marking to identify the extent to which students felt that they were adequately prepared to assess others work based on a complex open-ended problem. Complementary and contradicting statements were used in the questionnaire in order to check the validity and reliability of student's response. For instance,

Q11. I took a serious attitude towards marking peers' work.

Q12. I felt that I was critical of others when marking it.

were examples of complementary statements, whereas

Q17. I think that the rubrics was written in a clear manner which allowed me to accurately assess the work.

Q20. I found the rubrics for the coursework confusing.

were examples of contradictory statements

There was also an optional, open-ended question where students were prompted to offer additional comments on peer assessment. The responses were generally short, descriptive comments reflecting their thoughts. Upon completion, students were then asked to return the questionnaire results to the lecturer for analysis. A total of 65 questionnaires from both cohorts were obtained (as shown in Table 1). The response rate of the questionnaire for the entire cohort was between 67 and 72% for the Foundation degree cohort and 66 and 72% for the Petroleum Engineering cohort, with not every student answering all questions in the questionnaire and not all students providing comments for the optional open-ended question. Student comments on their thoughts were coded into common themes: experiences of and attitudes towards rubrics; and experiences of and attitudes towards peer assessment.

Table 1: Number of questionnaire responses, and self and peer assessment marking for coursework.

Course	Assessment paring			Questionnaire responses
	Male	Female	Total	Total
Foundation Degree (N=58)	13	29	42	42
Petroleum Engineering (N=38)	10	7	17	23

(Note: Six students from Petroleum Engineering did not complete the assessment forms)

Analyses

Marks and responses were statistically evaluated using Excel software, and the mean and standard deviation were calculated to quantify group responses. In addition, Spearman's correlation coefficient was used to measure the strength and direction of association between ranked variables. A value of 1 illustrated a perfect correlation between both variables, meaning that an increase in one was found to indicate an increase in the other variable. A value of -1 was taken as a perfect anti-correlation between the variables, indicating that as one variable increased, the corresponding response for the second variable decreased. As the significance of the coefficient varies with sample size, results were taken to be statistically significant based on the data provided in Zar (1984) using a significance level (α) of less than 0.025 unless otherwise stated in the text.

Results and Discussion

Montalvão and Baker (2015) reported that students marked over a narrower distribution than the lecturer when undertaking peer assessment, with one conclusion drawn being that students were reluctant to fail their peers. Comparison of the marks obtained in this study do not support this view, with a minority of marks being in the failed range for both cohorts. Montalvão and Baker (2015) applied a “holistic approach” with a scale from 1 – 10 rather than a detailed rubric as used in this study, and it is likely that this provision of a detailed framework on which to evaluate both themselves and peers led to increased confidence and understanding to provide a fail mark.

Comparison of Marks Between Lecturer, Self and Peer Assessment

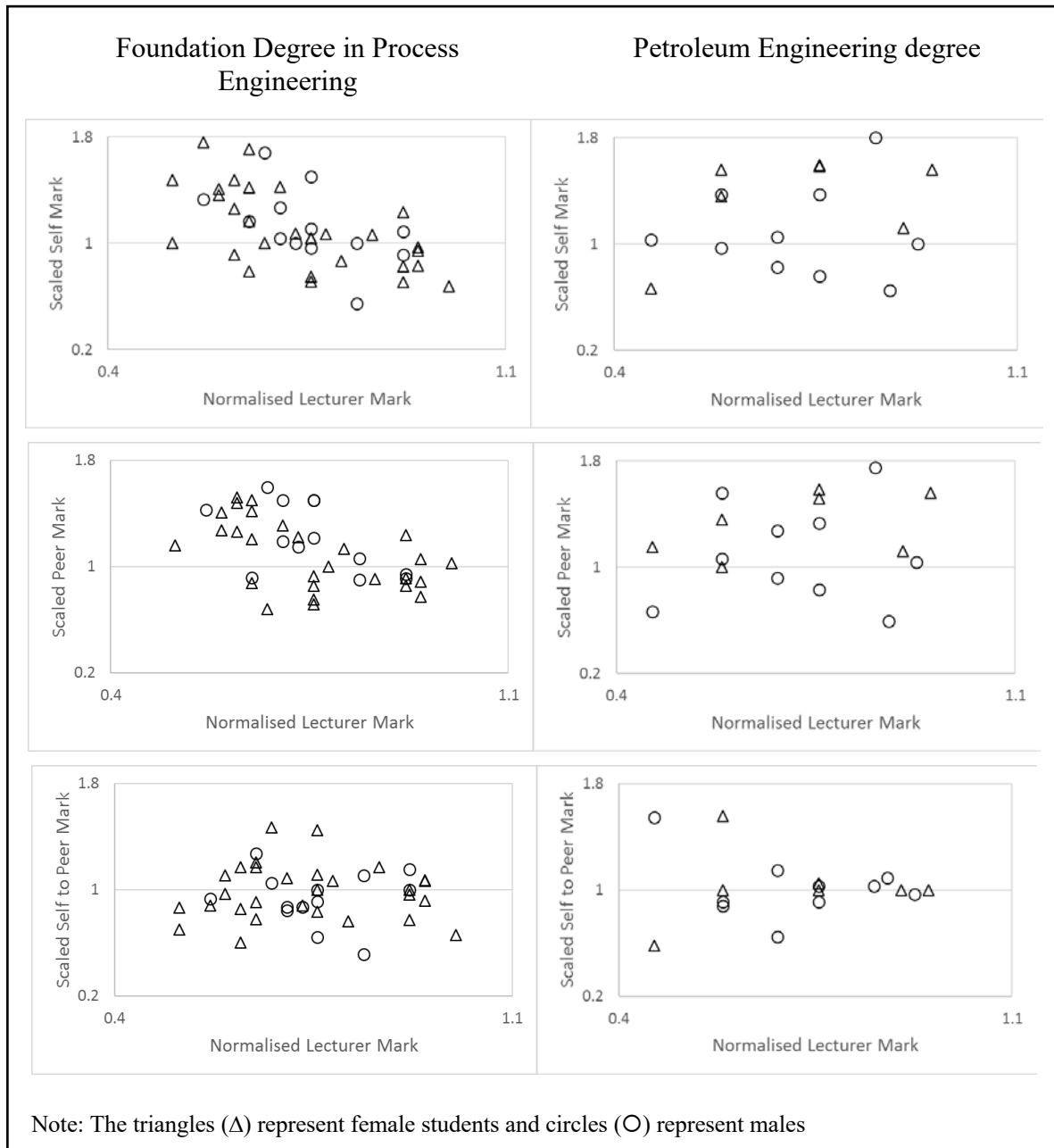
A comparison is presented in Table 2 between the marks awarded by each assessor using the lecturer mark as a reference. The data is presented as the difference between the average cohort marks, calculated as the total marks allocated within the cohort divided by the number of students, and then as the average variation in individual marks, calculated as the summed difference between markers for each student divided by the number of students.

Table 2: Difference in marks given to students as compared to the lecturer

Gender	Course	Average overall marks for the cohort (%)		Average variation in individual marks for the cohort (%)			
		Self-assessment	Peer assessment	Self-assessment		Peer assessment	
				M	SD	M	SD
Male	Foundation Degree	+10	+20	21.2	21.8	26.7	20.4
	Petroleum Engineering	+3	+4	24.2	24.6	30.0	22.9
Female	Foundation Degree	+7	+7	24.1	20.2	28.2	25.6
	Petroleum Engineering	+30	+30	39.8	20.8	31.1	22.4

When looking at the average overall marks of the cohort, it can be seen that the total number of marks awarded for Petroleum Engineering students is similar for all assessment types whilst marks given for self and peer assessment are much greater for the Foundation degree students. At a rudimentary level this might indicate that the self and peer assessment gave an accurate indication of the cohort average performance for Petroleum Engineering students. However, a more detailed comparison for individual students indicates that the average difference between assessors was over 20% with Foundation degree students actually being slightly closer to the lecturer mark than the Petroleum Engineering students. The cohort averages for self-assessment indicate that students were less generous with themselves (excepting female Petroleum Engineers) when compared to peer-assessment, with the average difference being three to ten percent higher than the lecturer. Interestingly, peer assessment marks were generally higher than self-assessment apart from female Petroleum Engineers where there were no major differences between their self and peer marks. The average variation in individually awarded marks is considerably larger than the difference in the cohort average, and this is best represented for the case of Petroleum Engineering male students. The average overall marks agree within 4% for both self and peer assessments, whilst the average absolute difference between the marking is closer to 24 – 30%. It is important to represent the results as critically as possible, as any future use of the techniques evaluated can affect individual student attainment and its measurement. This was also observed in by Davey (2015), although not explicitly stated, who reported agreement in terms of question averages but comparison of the data illustrated significant average difference between markings similar to this study.

Spearman Ranks were calculated for the individual cohorts, and no statistically relevant correlation was observed for the Petroleum Engineering students, perhaps as a result of their small cohort sizes. Figure 1 provides the ratio of self/peer to lecturer marks (scaled) to against the normalised lecturer mark with respect to the highest mark awarded for self-assessment, peer assessment and ratio of self to peer mark. Amongst Foundation Engineering students, there are negative correlations for both peer and self for both male and female students [Spearman Ranks: male self (-0.898), male peer (-0.623), female self (-0.604), and female peer (-0.615)]. This indicates that using the lecturer mark as a benchmark of student performance, students who performed weakly in the assessment were more likely to be over-marked by both themselves and their peers.



Note: The triangles (Δ) represent female students and circles (○) represent males

Figure 1: Comparisons of lecturer marks awarded to students from self, peer and lecturer assessment. Unless explicitly stated in the figure, scaled marks are those divided by the lecturer mark for that student.

No correlation was observed in Figure 1 for the ratio of self to peer mark plotted against lecturer mark, and Figure 2 presents a comparison of the same ratio plotted against normalised peer mark.

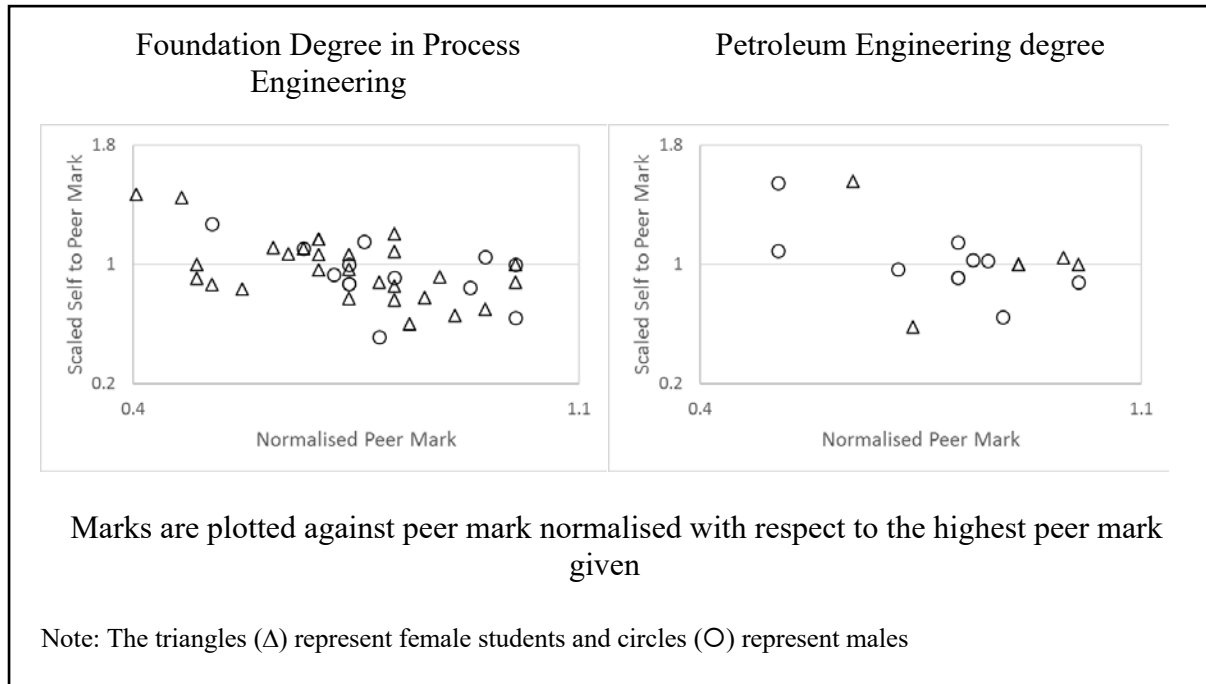


Figure 2: Comparison of self to peer marks. Scaled marks are those divided by the peer assessment mark for that student.

A negative correlation for the Foundation students [Spearman Ranks: male (-0.633), female (-0.435, significant for $\alpha = 0.05$)] is observed, indicating that as the peer mark decreases, students have a tendency to mark themselves more highly in self-assessment. This could indicate that weaker students tend to overestimate their own ability in comparison to others. The results in Figure 1 also indicate that higher scoring students were given lower marks by peers in this study, when compared to marks given to the lower scoring students. However, students are more likely to base their perception on student ability on the historical performance throughout the degree rather than unknown performance in an individual assessment.

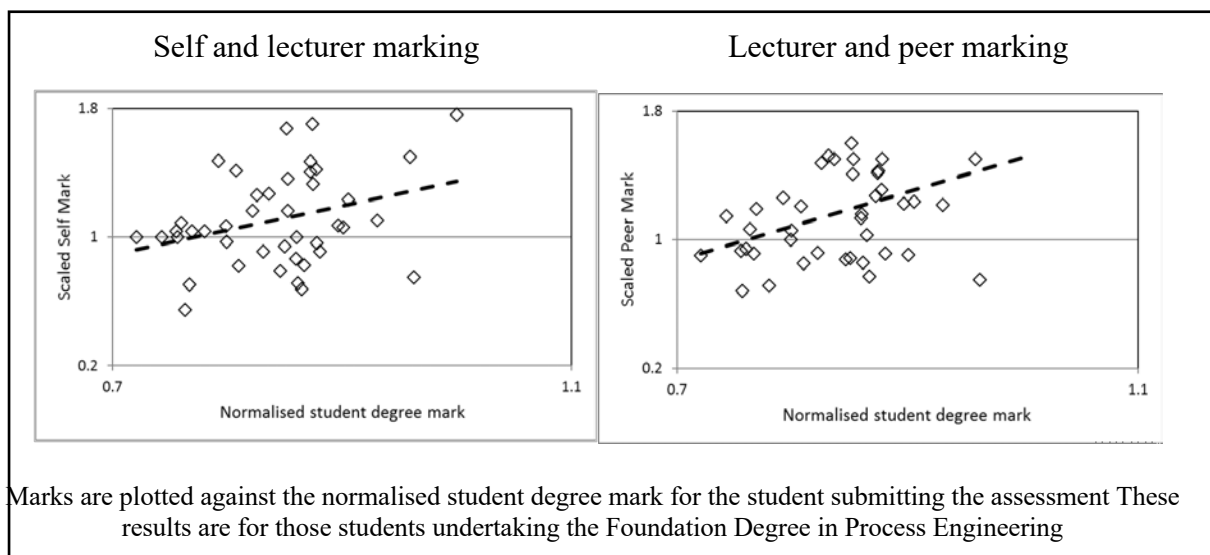


Figure 3: Comparison of marks between self and lecturer and lecturer to peer. Scaled marks are those divided by the lecturer mark for that student.

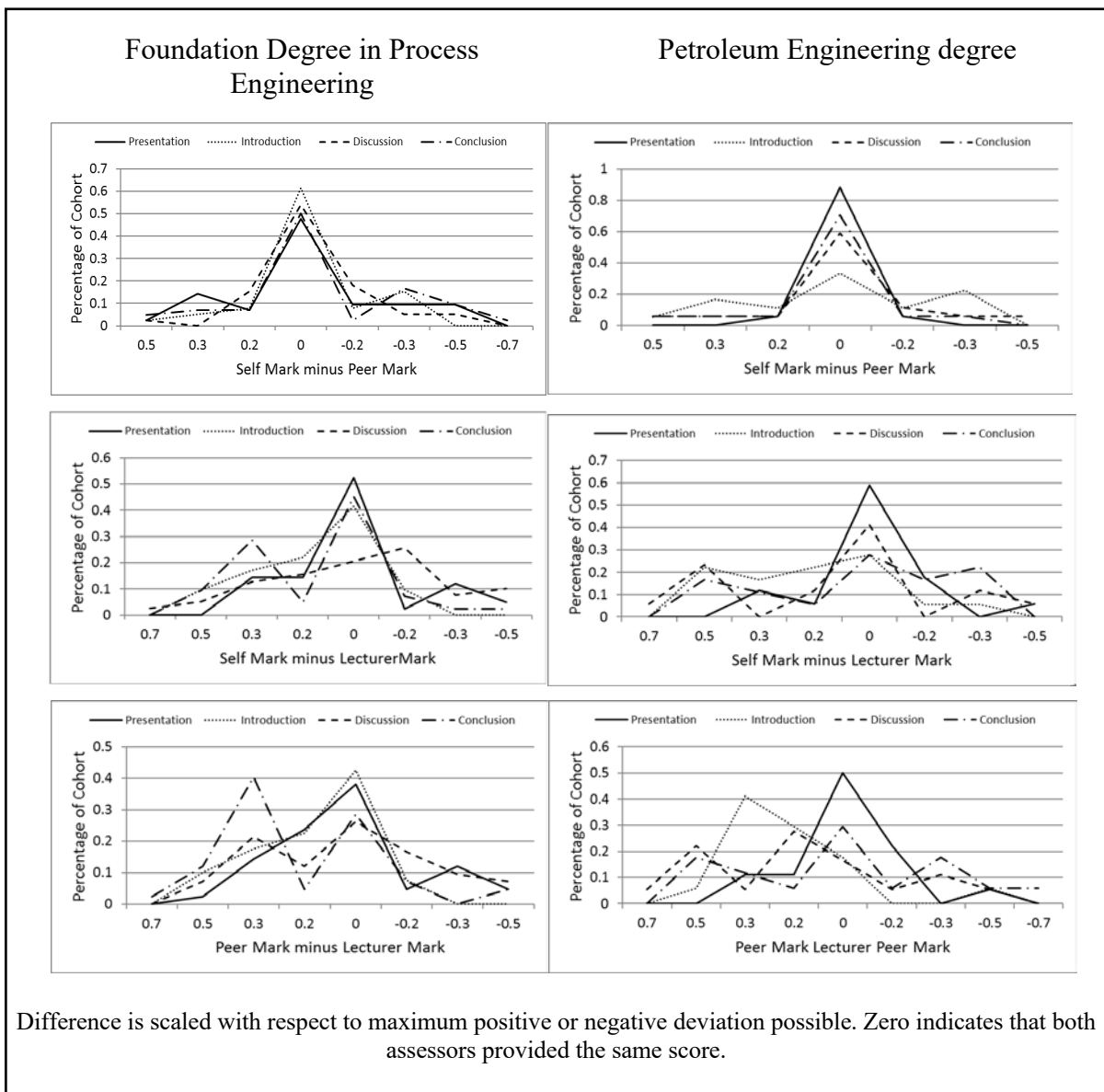
Figure 3 presents results for Foundation students of self and peer assessment, marks scaled by lecturer mark against their normalised performance in their overall degree. It indicates the level to which the students over or under mark themselves with respect to actual performance as determined by the lecturer. The correlation factors for these results are relatively low [Spearman Rank: peer (0.340) and self (0.255)] however, they could still be considered statistically significant for the sample size ($n=40$) at higher α values of 0.05 and 0.1 respectively and indicate a positive correlation between both self and peer assessment marks and student degree performance.

Whilst there is considerable scatter in the data, this positive correlation indicates that as academic performance (as measured by performance in overall degree) increases, both perception of performance by self and peer increases with respect to actual performance for students. In a study in the United States of America, Sadler and Good (2006) reported that poorly performing students have the tendency to overrate themselves as compared to tutor's grading, and this is different from the findings presented here. One possibility for the difference is as a result of the cultural background of the students involved in this work. Unlike in some Western societies, anecdotal evidence and experience indicates that students in South East Asia are more likely to view good academic performance with admiration rather than jealousy. As a result, there will not be the same negative perception of good performance, akin to that seen with "rate-busting" in western industries, and hence the students in this study are biased in the opposite manner, that is, towards rather than against high performing students.

It is noted that the quantitative results presented here have similarities to previous studies. The results concur with Davey (2015) with very poor agreement in marks between assessors and there is significant scatter in data as seen by Davey and Palmer (2012). The results also indicate poor rater reliability similar to Andrade (2005) and Moskal and Leydens (2000). As with Andrade and Du (2005), there was no obvious gender bias in the poor correlation, and students provide on average higher marks for both self-assessment (as with Davey, 2015) and De Grez et al., 2012) and peer-assessment (as with Montalvão and Baker, 2015). However, the analysis presented here are more scattered than for Davey (2015) indicating that self-assessment is more unreliable when compared to lecturer assessment when the assessment is based on open ended rather than closed questions.

Even with a rubric to guide students as in this work, or model answers as in the case of Davey (2015), students seem to be on average more generous than the lecturer. As a result, it seems that to maintain fair and consistent marking, all students in a cohort should be marked by the same individual or group of individuals. These large differences contradict the assertion by Asikainen et al. (2014) that when using peer assessment, only assessment marking with substantially different marks given by the assessors should require reassessment by the teacher to ensure reliability.

To see whether discrepancies in marking were caused by a specific element of the rubrics, the marks between each assessor (lecturer, self and peer) for the total marks were compared within the four categories: Presentation, Introduction, Discussion, Conclusion. Figure 4 presents a detailed evaluation of the similarity in marking between various assessors with the observed difference scaled with respect to maximum positive or negative deviation possible.



Difference is scaled with respect to maximum positive or negative deviation possible. Zero indicates that both assessors provided the same score.

Figure 4: Comparison of marks between assessors for the different sections

The degree to which marks between assessors were similar for the different sections of the rubric for Foundation degree and Petroleum Engineering is represented on the x-axis, where for a value of zero both assessors provided the same score. The result indicates that whilst there was a relatively high agreement on marks of individual sections between assessors, equivalent to 70% – 90% exact agreement in some cases, these were not carried forth into consistently high agreement in the total marks awarded. The sections with the highest level of agreement between assessors tended to be the presentation or introduction sections, but quantitatively the marks were not consistent between lecturer and either self or peer assessments. This poor correlation between different markers highlights the challenge in the development of a thorough methodology for the implementation of robust and repeatable student self and peer assessments. A past study in a Chemical Engineering class by Davey (2011) found that students generally gave higher marks for descriptive questions as compared to the lecturer, whilst both students and lecturer marked the numeric questions equally on average. The development of rubrics, even in non-technical disciplines, requires a great deal of effort and time and in this work, the very poor agreement in areas that require a higher level of technical knowledge are

likely attributed to a lack of in-depth knowledge by students on the arguments surrounding each technical point.

Hassmén, Sams, and Hunt (1996) found that students who undertook self-assessments performed better in the final test, whilst Andrade and Du (2005) stated that students' perceptions were that they attain better results or grades as a result of the use of rubrics. To compare the impact in this study, a comparison of the total marks awarded in the final exam is given in Figure 5 against the marks awarded for the question related to the topic covered in the coursework. As can be seen, both cohorts on average performed significantly better in the coursework related question than in the overall exam. Whilst this indicates that the coursework had long term impact on the students learning and recall of information, it should be noted that the improved performance could also be due to the level of the questions in the exam or be indicative that students found those topics easier to learn than others. It cannot be definitively proven which of the above arguments resulted in the increased student performance, however the results when combined with student feedback in Table 3 do suggest that at the very least, the use of rubric has not hindered the students learning as shown by subsequent assessments. The overall results of this study agree with those of others such as Falchikov and Boud (1989) and indicate that even though there is a lack of agreement between students and tutor's marks, self-assessment and peer assessment are valuable assessment tools by providing feedback to students on their learning and educational standards. Through undertaking the marking themselves they are learning through active practice, rather than passive participation, and therefore more likely to remember the information over a longer timeframe.

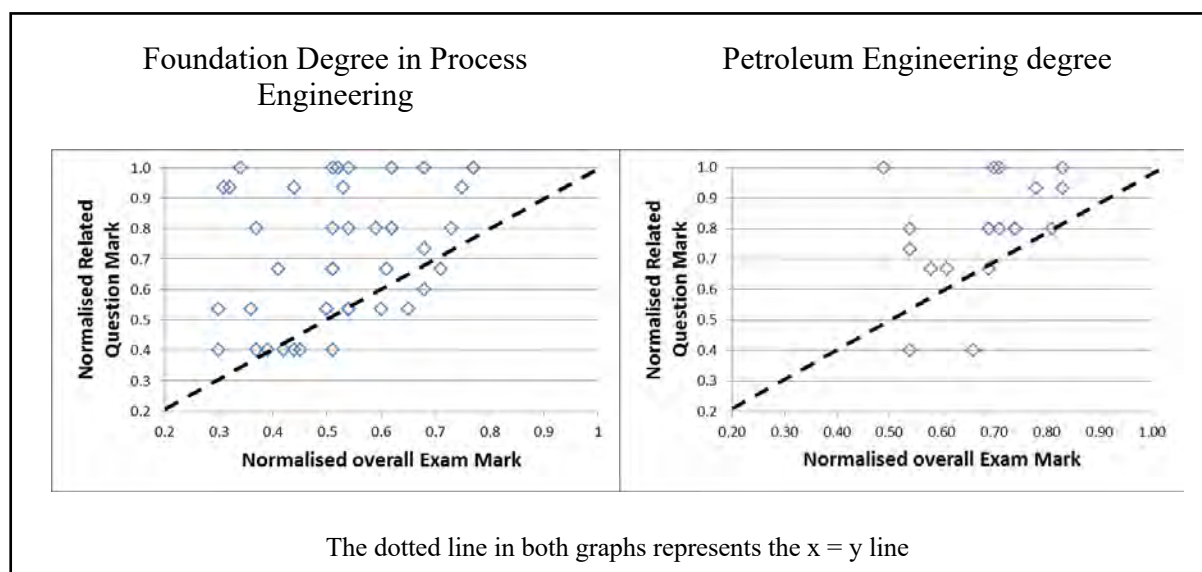


Figure 5: Comparisons of the exam mark against related question mark

Students' Experience of Learning

In addition to the correlation of rubrics with lecturer, self and peer marks, this study was also concerned with the students' perceptions of and the attitudes towards the peer and self-assessment exercise. Table 3 provides information on the student responses to the questionnaire survey along with cohort averages and standard deviations for each question. In subsequent sections these averages will be presented in square brackets to support interpretation of students' experiences.

Table 3: Summary of number of questionnaire responses and category of response for each survey statement. Numbers in brackets are the number of students who filed a response.

Q.	Survey Statement Response							Foundation Degree (n)		Petroleum Engineering (n)		TOTAL (n)	
	1	2	3	4	5	6	7	M	SD	M	SD	M	SD
1)	7	5	3	4	11	26	6	4.21 (39)	2.13	5.70 (23)	0.82	4.76 (62)	1.90
2)	0	0	2	11	26	17	6	5.25 (40)	0.95	5.18 (22)	1.01	5.23 (62)	0.97
3)	0	1	5	12	15	20	12	5.43 (42)	1.19	5.04 (23)	1.40	5.29 (65)	1.27
4)	1	2	4	21	12	20	5	5.12 (42)	1.17	4.39 (23)	1.44	4.86 (65)	1.31
5)	0	0	1	12	22	20	10	5.50 (42)	1.04	5.22 (23)	0.95	5.40 (65)	1.01
6)	0	0	3	24	18	12	6	4.85 (40)	1.05	5.00 (23)	1.13	4.90 (63)	1.07
7)	2	3	11	22	11	9	5	4.23 (40)	1.46	4.52 (23)	1.38	4.33 (63)	1.43
8)	11	12	17	22	2	0	1	3.05 (42)	1.10	2.74 (23)	1.51	2.94 (65)	1.26
9)	0	0	1	7	27	23	7	5.52 (42)	0.92	5.26 (23)	0.81	5.43 (65)	0.88
10)	0	0	3	20	20	18	4	5.14 (42)	1.05	4.74 (23)	0.92	5.00 (65)	1.02
11)	0	0	4	14	15	17	13	5.17 (42)	1.19	5.67 (21)	1.24	5.33 (63)	1.22
12)	0	0	4	19	22	15	5	4.81 (42)	1.02	5.26 (23)	1.05	4.97 (65)	1.05
13)	1	3	8	12	22	10	9	4.86 (42)	1.30	4.70 (23)	1.66	4.80 (65)	1.43
14)	0	0	1	7	28	19	10	5.43 (42)	0.89	5.52 (23)	1.04	5.46 (65)	0.94
15)	0	0	0	5	15	23	20	5.88 (40)	0.88	6.00 (23)	1.04	5.92 (63)	0.94
16)	0	0	0	4	14	23	19	5.90 (39)	0.88	6.05 (21)	0.97	5.95 (60)	0.91
17)	0	0	2	5	22	24	12	5.55 (42)	0.89	5.70 (23)	1.15	5.60 (65)	0.98
18)	0	0	1	7	20	26	11	5.52 (42)	0.77	5.74 (23)	1.21	5.60 (65)	0.95
19)	1	1	3	19	20	15	5	5.05 (42)	1.01	4.59 (22)	1.47	4.89 (64)	1.20
20)	5	10	8	25	9	2	1	3.53 (38)	1.37	3.59 (22)	1.33	3.55 (60)	1.35
21)	3	6	8	23	12	6	3	4.00 (39)	1.34	4.18 (22)	1.59	4.07 (61)	1.42

Note: Seven point Likert scale: 7 = strongly agree, 1 = strongly disagree, and 4 = no opinion or neutral response.

Statements:

1. I have undertaken peer assessment previously.
2. Peer assessment is a worthwhile activity.
3. Giving feedback to my peers is very difficult.
4. I feel that my peers have adequate knowledge to evaluate my work.
5. I feel that peer assessment is helpful to my learning.
6. Giving feedback to my peers is useful to me.
7. I would prefer not to do peer assessment on others.
8. I prefer peer assessment rather than lecturer's feedback.
9. I learnt something through performing peer review.
10. Peer assessment activity motivates me to learn.
11. I took a serious attitude towards marking peers' work.
12. I felt that I was critical of others work when marking it.
13. When marking the coursework, I focused on the task at hand, and did not find my mind wandering to how my own coursework was being marked.
14. I learnt something further about the subject through marking coursework using the rubrics.
15. Having used the rubrics, I now have a better understanding of what was expected in the coursework
16. Having marked coursework using a rubrics, I now have a better understanding of what is expected of me during coursework.
17. I think that the rubrics was written in a clear manner which allowed me to accurately access the work.
18. I think that the presentation given at the beginning of the class on how to use rubrics prepared me well enough to assess the work.
19. I think rubrics based peer assessment is a fair method to assess student's performance.
20. I found the rubrics for the coursework confusing.
21. I would like more assessment run in this manner in the future.

Experiences of and Attitudes Towards Rubrics

Previous research (Andrade & Du, 2005; Davey & Palmer, 2012; De Grez et al., 2012) has shown that students' perceptions on using rubrics are largely positive, and this was the general trend observed in this work. Students from both cohorts reported that they found the rubric well written [Q17: FD 5.55, PE 5.70] and did not find it confusing [Q20: FD 3.53, PE 3.59]. They also felt that the presentation and training at the beginning of the session prepared them well enough to implement the rubrics [Q18: FD 5.52, PE 5.74]. This indicates that despite the differences between assessor marks results presented previously, students felt that they were adequately prepared to assess their work using the provided rubric. Students also felt that the rubrics is a fair assessment method to assess students' performance [Q19: FD 5.05, PE 4.59]. This is highlighted by one student, as shown in the following extract.

It is nerve wrecking but at least I know why I lost and won some marks.

Davey (2015) found that the use of rubrics stimulated interest in the course. Students from both cohorts felt that by marking their coursework using rubrics enhanced their understanding of the module content [Q14: FD 5.43, PE 5.52], and students also found that the use of the rubrics improved their understanding of what was required for the coursework [Q15|Q16: FD 5.88|5.90, PE 6.00|6.05]. This is further supported by students' additional comments in the questionnaire, as shown in the following extracts below.

Rubric is very useful in the sense that we know what points we should raise while writing our report.

Interesting way of marking the coursework. Looking forward for the methods results.

Fun activity.

It was fun and a new experience for me.

An increased understanding of coursework expectations through the use of the rubric is an expected response, as students were provided with a detailed written description of how the work was to be marked alongside the demonstration of how to implement it. The use of the rubrics encourages students to learn more about the content of the module as they are motivated to at the very least on a superficial level to understand the content relating to the coursework in order to assess their peers. Andrade (2010) stated that rubrics provide informative feedback on students' knowledge and competency, and this is further illustrated in the results presented here.

Experiences of and Attitudes Towards Peer Assessment

The previous experience of students in this study to peer assessment was varied [Q1: FD 4.21, PE 5.70] with a greater proportion of the Petroleum Engineering cohort having undertaken it previously to the Foundation degree cohort. The results in Table 3 highlight that students in both cohorts found the use of peer assessment to be a useful activity [Q2: FD 5.25, PE 5.18] which aided their learning [Q5|Q9: FD 5.50|5.52, PE 5.22|5.26]. Students also found the peer assessment exercise motivated them to learn [Q10: FD 5.14, PE 4.74]. A previous study by Nicol et al. (2014) found that peer assessment is favoured positively by students and this is further illustrated in this work, and the students from both cohorts also felt that their peers had adequate knowledge to assess their them [Q4: FD 5.12, PE 4.39] and that they took on a professional attitude in doing the exercise [Q11|Q12|Q13: FD 5.17|4.81|4.86, PE 5.67|5.26|4.70]. Despite this, some students voiced concerns or doubts on peer assessment as noted by some students in the following extracts:

Some people do not have enough knowledge to actually give extra point for additional points.

I need to refer to someone more expert when marking other's papers in order to minimise the errors during marking.

I need more experience when marking others/papers as wrong way of marking might disrupt others' outcome.

I am concern on how people will see the way I mark their paper.

Bolton (2006) found that the use of rubrics can be useful in providing feedback to students, whilst Andrade (2005) have stated that it is not a direct replacement for instruction, lecturer feedback and opportunities to ask questions. These findings are consistent with the response of students during this work, and whilst both student cohorts find providing feedback to others useful [Q6: FD 4.85, PE 5.00], they did not view it as an acceptable replacement for lecturer feedback [Q8: FD 3.05, PE 2.74]. Unfortunately, it cannot be evaluated through their responses

whether or not the students realised that through applying the rubric to their and others' work they are obtaining much more detailed indirect feedback from the lecturer on both their work and that of others. Davey (2011) reported broad student agreement that peer assessment is an effective way to learn and stimulates interest in course material although idealised solutions of the lecturer were essential for successful peer assessment outcomes. Preferences for lecturer's feedback was also apparent as expressed by some of the students in their comments, illustrated by the following from three different students:

I would like the lecturer to mark it first, so that we could compare our marking with the lecturer straight away.

I prefer if the lecturer marks our report because they have deeper understanding on this module/topic of the report.

I prefer the hands of experts to mark the coursework.

In spite of students highlighting that the activity increased their learning and understanding of both the coursework expectations and course content, they acknowledged that giving feedback to peer was a difficult task [Q3: FD 5.43, PE 5.04] and they weakly indicated that they would rather not do it [Q7: FD 4.23, PE 4.52] and were non-committal about the approach being adopted in other modules [Q21: FD 4.00, PE 4.18]. This result is different from student perceptions reported by Davey (2015) for self-assessment at an Australian University who reported using a similar Likert scale that students were keen to have in other courses [average 4.7]. This indicates the challenges present in applying teaching methodologies across different cultures and provides data contrary to the views presented in Richmond (2007) that Asian students are willing to move away from the spoon-fed teaching culture which they have been traditionally subjected to and embrace other forms of learning. One student also suggested to be given more time in the peer assessment activity as 90 minutes can be rather tight when they had to do a self-assessment followed by a peer assessment.

Given the results presented in both the marks and questionnaire analysis, the students seem to have been unknowingly ill-prepared to accurately evaluate their work. One issue is that a 'non-expert' might have been awarding marks when the listed relevant points were raised in the essay, even when that argument point was presented incorrectly. Subsequent informal discussion with students highlighted that when evaluating the points in Appendix B, there were differences in interpretation depending on the context surrounding where in the work the point was raised. The technical expert caught numerous examples where the points raised met the initial rubric criteria however they were presented in the wrong context (specifically Discussion points 6-9). This level of subjectivity to the marking highlights a major failing with the manner in which the rubric was presented, with additional detail being required for each point to allow the students to accurately identify its relevant inclusion. Whilst a more detailed rubric might reduce ambiguity, it is unlikely that the assessor can foresee every argument in an open-ended problem. Indeed it was for this reason that the rubric allowed for "additional points". From a practical perspective, a balance is required between the need to develop robust and thorough rubrics for the assessment of work and the competing demands of lecturer time.

Conclusion

The work presented in this study presents an evaluation of the use of peer and self-assessments as part of the learning process of an open-ended essay-based coursework in a year two degree

engineering module in Brunei Darussalam. The present study sets out to investigate whether, given reasonable training on rubrics, students were capable to assess their own work as well as of their peers; the correlation between the assessed work (self, peer and lecturer) and students' perceptions of the self and peer assessment exercise. The study was undertaken on two different cohorts of students, and comparison of the marks awarded by different markers; student; peer; and lecturer; showed very poor correlation between marks. Whilst there were correlations between different markers (i.e. peer – self) for certain subsections of the work, these tended to be for the non-technical sections and there was no overall correlation between marks. Correlation for the technical components was very poor, and likely the result of the in-depth understanding required to accurately apply the rubric to the context surrounding the various points required in the coursework. Comparison between student marking and lecturer found differences to those observed elsewhere, indicating that cultural background impacts how students perceive themselves and others with respect to academic ability and their use of rubrics to evaluate others work. Student feedback to the exercise found that most students held positive attitudes towards peer-assessment and felt that peer-assessment was a worthwhile activity which aided both their learning and motivation to learn. Bruneian students were open to being critically evaluated by their peers and appreciated the opportunity to experience new approaches and methodologies in the classroom. However, they then contradicted themselves somewhat by indicating that they would have preferred not to have to do it, perhaps as a result of finding it a difficult process to go through. This indicates the difficulty in introducing new pedagogical practices into the classroom, where negative student feedback to difficult situations is in conflict with the positive learning experience. Whilst the poor mark concordance in this exercise indicates that both peer and self-assessment are not suitable to quantitatively evaluate student performance, the overall student experience was seen as positive and motivational to their learning and suitable for formative assessment.

The results of the present study suggest that more training is necessary for students in using rubrics as part of their assessment. A crucial message lies in the validity and reliability of rubrics having an impact on the quality of peer and self-assessments. This study only involved one second year class student undertaking a specific module within a programme, this limitation should be taken into account when considering the extent to which the results can be generalised into the wider higher education contexts. Although careful consideration was accounted for with respect to interrater reliability, the rater found that there is still a requirement for comprehensive training to increase the accuracy of rating. The implementation of rubrics in higher education has always been contextual, challenging and subjective. Peer and self-assessments can be alternatives to assessment along with the use of rubrics, provided all aspects are planned methodically and students are made conscious of the steps and procedures in order to execute it well.

References

- Andrade, H. G. (2000). Using rubrics to promote thinking and learning. *Educational Leadership*, 57(5), 13–19.
- Andrade, H. G. (2005). Teaching with rubrics: The good, the bad, and the ugly. *College Teaching*, 53(1), 27–31. <https://doi.org/10.3200/CTCH.53.1.27-31>
- Andrade, H. G. (2010). Students as the definitive source of formative assessment. In H. Andrade & G. Cizek, (Eds.). *Handbook of Formative Assessment*, (pp. 90–105). Florence, KY: Routledge.
- Andrade, H. G., & Boulay, B. A. (2003). Role of rubric-referenced self-assessment in learning to write. *Journal of Educational Research*, 97(1), 21–30. <https://doi.org/10.1080/00220670309596625>
- Andrade, H. G., & Du, Y. (2005). Student perspectives on rubric-referenced assessment. *Practical Assessment, Research & Evaluation*, 10(3), 1–11.
- Andrade, H. G., Du, Y., & Wang, X. (2008). Putting rubrics to the test: The effect of a model, criteria generation, and rubric-referenced self-assessment on elementary school students' writing. *Educational Measurement: Issues and Practice*, 27(2), 3–13. <https://doi.org/10.1111/j.1745-3992.2008.00118.x>
- Andrade, H. G., & Valtcheva, A. (2009). Promoting learning and achievement through self-assessment. *Theory into Practice*, 48(1), 12–19. <https://doi.org/10.1080/00405840802577544>
- Arendt, A., Trego, A., & Allred, J. (2016). Students reach beyond expectations with cafeteria style grading. *Journal of Applied Research in Higher Education*, 8(1), 2–17. <https://doi.org/10.1108/JARHE-03-2014-0048>
- Asikainen, H., Virtanen, V., Postareff, L., & Heino, P. (2014). The validity and students' experiences of peer assessment in a large introductory class of gene technology. *Studies in Educational Evaluation*, 43, 197–205. <https://doi.org/10.1016/j.stueduc.2014.07.002>
- Bolton, F. C. (2006). Rubrics and adult learners: Andragogy and assessment. *Assessment Update*, 18(3), 5–6. <https://doi.org/10.1002/au.183>
- Boud, D. (1995). Assessment and learning: contradictory or complementary? *Assessment*, 35–48.
- Brookhart, S. M. (2018). Appropriate criteria: Key to effective rubrics. *Frontiers in Education*, 3(22). <http://doi.org/10.3389/educ.2018.00022>
- Cho, K., Schunn, C. D., & Wilson, R. W. (2006). Validity and reliability of scaffolded peer assessment of writing from instructor and student perspectives. *Journal of Educational Psychology*, 98(4), 891–901. <http://dx.doi.org/10.1037/0022-0663.98.4.891>
- Davey, K. R. (2011). Student peer assessment: Research findings from a case study in a master of chemical engineering coursework-program. *Education for Chemical Engineers*, 6(4), e122–e131. <https://doi.org/10.1016/j.ece.2011.08.004>
- Davey, K. R. (2015). Student self-assessment: Results from a research study in a level IV elective course in an accredited bachelor of chemical engineering. *Education for Chemical Engineers*, 10, 20–32. <https://doi.org/10.1016/j.ece.2014.10.001>

- Davey, K. R., & Palmer, E. (2012). Student peer assessment: A research study in a level III core course of the bachelor chemical engineering program. *Education for Chemical Engineers*, 7(3), e85–e104. <https://doi.org/10.1016/j.ece.2012.04.001>
- De Grez, L., Valcke, M., & Roozen, I. (2012). How effective are self- and peer assessment of oral presentation skills compared with teachers' assessments? *Active Learning in Higher Education*, 13(2), 129–142. <https://doi.org/10.1177%2F1469787412441284>
- Falchikov, N. (2003). Involving students in assessment. *Psychology Learning & Teaching*, 3(2), 102–108. <https://doi.org/10.2304%2Fplat.2003.3.2.102>
- Falchikov, N. (2005). *Improving assessment through student involvement: Practical solutions for aiding learning in higher and further education*. Oxon, UK: Routledge.
- Falchikov, N., & Boud, D. (1989). Student self-assessment in higher education: A meta-analysis. *Review of Educational Research*, 59(4), 395–430. <https://doi.org/10.3102%2F00346543059004395>
- Freeman, M. (1995). Peer assessment by groups of group work. *Assessment & Evaluation in Higher Education*, 20(3), 289–300. <https://doi.org/10.1080/0260293950200305>
- Fry, S. A. (1990). Implementation and evaluation of peer marking in higher education. *Assessment and Evaluation in Higher Education*, 15(3), 177–189. <https://doi.org/10.1080/0260293900150301>
- Hanrahan, S. J., & Isaacs, G. (2001). Assessing self-and peer-assessment: The students' views. *Higher Education Research & Development*, 20(1), 53–70. <https://doi.org/10.1080/07294360123776>
- Hassmén, P., Sams, M. R., & Hunt, D. P. (1996). Self-assessment responding and testing methods: effects on performers and observers. *Perceptual and Motor Skills*, 83(3_suppl), 1091–1104. <https://doi.org/10.2466/pms.1996.83.3f.1091>
- Jonsson, A., & Svingby, G. (2007). The use of scoring rubrics: Reliability, validity and educational consequences. *Educational Research Review*, 2(2), 130–144. <https://doi.org/10.1016/j.edurev.2007.05.002>
- Kwan, K., & Leung, R. W. (1996). Tutor versus peer group assessment of student performance in a simulation training exercise. *Assessment & Evaluation in Higher Education*, 21(3), 205–214. <https://doi.org/10.1080/0260293960210301>
- Likert, R. (1932). A technique for the measurement of attitudes. *Archives of Psychology*.
- Liu, N.-F., & Carless, D. (2006). Peer feedback: the learning element of peer assessment. *Teaching in Higher Education*, 11(3), 279–290. <https://doi.org/10.1080/13562510600680582>
- Longhurst, N., & Norton, L. S. (1997). Self-assessment in coursework essays. *Studies in Educational Evaluation*, 23(4), 319–330.
- Moni, R. W., & Moni, K. B. (2008). Student perceptions and use of an assessment rubric for a group concept map in physiology. *Advances in Physiology Education*, 32(1), 47–54. <https://doi.org/10.1152/advan.00030.2007>
- Montalvão, D. & Baker, T. (2015). Correlating peer and tutor assessment on a low-stakes engineering assignment. *International Journal of Mechanical Engineering Education*, 43 (3), 168-179. <https://doi.org/10.1177/0306419015603008>

- Moskal, B. M., & Leydens, J. A. (2000). Scoring rubric development: Validity and reliability. *Practical Assessment, Research & Evaluation*, 7(10), 71–81.
- Nagori, R., & Cooper, M. (2014). Key principles of peer assessments: A feedback strategy to engage the postgraduate international learner. *IAFOR Journal of Education*, 2(2). <https://doi.org/10.22492/ije.2.2.07>
- Nicol, D., Thomson, A., & Breslin, C. (2014). Rethinking feedback practices in higher education: a peer review perspective. *Assessment & Evaluation in Higher Education*, 39(1), 102–122. <https://doi.org/10.1080/02602938.2013.795518>
- Oldfield, K. A., & Macalpine, J. M. K. (1995). Peer and self-assessment at tertiary level - an experiential report. *Assessment in Higher Education*, 20(1), 125–132. <https://doi.org/10.1080/0260293950200113>
- Orpen, C. (1982). Student versus lecturer assessment of learning: a research note. *Higher Education*, 11(5), 567–572. <https://doi.org/10.1007/BF00194421>
- Reddy, Y. M., & Andrade, H. G. (2010). A review of rubric use in higher education. *Assessment & Evaluation in Higher Education*, 35(4), 435–448. <https://doi.org/10.1080/02602930902862859>
- Reyna, J., & Meier, P. (2018). Learner-generated digital media (LGDM) as an assessment tool in tertiary science education: A Review of Literature. *IAFOR Journal of Education*, 6(3). <https://doi.org/10.22492/ije.6.3.06>
- Rezaei, A. R., & Lovorn, M. (2010). Reliability and validity of rubrics for assessment through writing. *Assessing Writing*, 15(1), 18–39. <https://doi.org/10.1016/j.asw.2010.01.003>
- Richmond, J. E. D. (2007). Bringing critical thinking to the education of developing country professionals. *International Education Journal*, 8(1), 1–29.
- Rodgers, T. L. (2019). Peer-Marking and peer-feedback for coding exercises. *Education for Chemical Engineers*, 29, 56–60. <https://doi.org/10.1016/j.ece.2019.08.002>
- Rushton, C. (1993). Peer assessment in a collaborative hypermedia environment: A case study. *Journal of Computer-Based Instruction*, 20(3), 75–80.
- Sadler, P. M., & Good, E. (2006). The impact of self-and peer-grading on student learning. *Educational Assessment*, 11(1), 1–31. https://doi.org/10.1207/s15326977ea1101_1
- Sendziuk, P. (2010). Sink or swim? Improving student learning through feedback and self-assessment. *International Journal of Teaching and Learning in Higher Education*, 22(3), 320–330.
- Tierney, R., & Simon, M. (2004). What’s still wrong with rubrics: focusing on the consistency of performance criteria across scale levels. *Practical Assessment, Research & Evaluation*, 9(2), 1–10.
- Tobajas, M., Molina, C. B., Quintanilla, A., Alonso-Morales, N., & Casas, J. A. (2019). Development and application of scoring rubrics for evaluating students’ competencies and learning outcomes in Chemical Engineering experimental courses. *Education for Chemical Engineers*, 26, 80–88. <https://doi.org/10.1016/j.ece.2018.11.006>
- Zar, J. H. (1984). *Biostatistical analysis*. (2nd ed.). New Jersey: Prentice-Hall, Inc., Eaglewood Cliffs.

Corresponding author: Lee Kok Yueh
Contact email: kokyueh.lee@utb.edu.bn

Appendices

Appendix A: Coursework Handout

Scenario: You are an employee of Hengyi, and you are evaluating the viability of building an oil refinery in Brunei (please ignore the fact that they are already building one). You have been asked to compile a 600-word report outlining the following:

Introduction: Basic introduction to your report, which should include the following; description of what an oil refinery does, including characteristic refinery size and life expectancy; main feedstock; main products and market for those products; introduction to Brunei, its location and resources. (100-150 words)

Discussion: This is where you discuss the advantages and disadvantages of locating a refinery in Brunei. The points for discussion could include, but are not limited to; suitable geographical location; access to and quality of raw materials over life cycle of the plant; access to product markets over life cycle of the plant; possible issues which affect refinery profitability; human capital resources; any social and political issues. (300-400 words)

Conclusion: This is where you highlight whether or not you think Hengyi should build a refinery in Brunei, along with the main arguments supporting your decision. (100-150 words)

Resources: You have been provided with a supporting document which you can use to start understanding where an oil refinery is placed within the “fuel supply chain”, along with some of the issues facing refineries. This document focuses on North America, and you are also expected to undertake your own research when considering both refineries and the local conditions present in Brunei.

Marking: This coursework will be peer evaluated by a fellow student in your class, and to help guide them a marking rubrics will be provided by the lecturer. The evaluation is provisionally scheduled to take place during a formally scheduled time slot in week 13 of the semester, prior to the exams. The report will subsequently be second marked by the lecturer, before a final mark is awarded to each student.

Appendix B: Rubrics and additional information

Name of student **self assessing**: _____ Course (FD or PE): _____

	Excellent (10 marks)	Good (8 marks)	Adequate (5 marks)	Needs improvement (3 marks)	Marks
Presentation (2)	<ul style="list-style-type: none"> Information is presented logically and naturally. There are no more than two mechanical errors or misspelled words to distract the reader. 	<ul style="list-style-type: none"> Information is presented in a logical manner that is easily followed. There is minimal interruption to the work due to misspellings and/or mechanical errors. 	<ul style="list-style-type: none"> The information is presented in an orderly fashion that can be followed with little difficulty. There are some misspellings and/or mechanical errors, but they do not seriously distract from the work. 	<ul style="list-style-type: none"> Information is presented in a disorganised fashion causing the audience to have difficulty following the author's ideas. There are many misspellings and/or mechanical errors. 	
Introduction (2)	10 – 11 of the points highlighted in the introduction list.	8 – 9 of the points highlighted in the introduction list.	5 – 7 of the points highlighted in the introduction list.	4 or less of the points highlighted in the introduction list.	
Discussion (4)	13 – 16 of the points highlighted in the introduction list.	10 – 12 of the points highlighted in the introduction list.	8 – 9 of the points highlighted in the introduction list.	7 or less of the points highlighted in the introduction list.	
Conclusion (2)	<ul style="list-style-type: none"> The audience is able to easily identify the focus of the work and is engaged by its clear focus and relevant details. Does not bring in any new arguments which haven't been included in the main text. Provides a summary of the main arguments covered in the discussion. 	<ul style="list-style-type: none"> The audience is easily able to identify the focus of the student work, supported by relevant ideas and supporting details. Does not bring in any new arguments which haven't been included in the main text. Provides a summary of most of the main arguments covered in the discussion. 	<ul style="list-style-type: none"> The audience can identify the central purpose of the student work without little difficulty and supporting ideas are present and clear. Introduces one new information or argument which isn't included in the main text. Provides a summary of some of the main arguments covered in the discussion. 	<ul style="list-style-type: none"> The audience cannot clearly or easily identify the central ideas or purpose of the student work. Introduces more than one new information or argument which isn't included in the main text. Provides a summary of only one of the main arguments covered in the discussion. 	
TOTAL MARKS					

	Points to raise
Introduction: description of what an oil refinery does, including characteristic refinery size and life expectancy	<ol style="list-style-type: none"> Oil refinery takes a mixture of crude oil feedstocks and converts it into a range of petroleum products. The configuration of the refinery depends on both the feedstock composition and product demand. Depending on prevailing economics the life expectancy would be multiples of 10's of years. A characteristic size for a refinery would be of the order 100-200,000 barrels per day. Whilst global range is 10,000 – 1.24million barrels per day.
Introduction: main feedstock; main products and market for those products;	<ol style="list-style-type: none"> Main feedstocks are crude oil of various qualities, normally a mixture of heavy, light, sweet and sour crude. Products are a combination of gasoline (petrol), diesel, jet fuels, kerosene, waxes and coke. Additional products are various petrochemical products used as intermediaries in chemical processes. Market for those products depends on global economic circumstances, and demand varies depending on the geographical location of the refinery.
Introduction: introduction to Brunei, it's location and resources	<ol style="list-style-type: none"> Brunei is a small country in SE Asia, located on Borneo Island. Brunei has a population of approx. 450,000. Brunei is a net exporter of oil and gas.
ADDITIONAL	If additional points are raised which you feel are valid information or arguments, you may allocate an extra point.
Discussion: suitable geographical location; access to and quality of raw materials over life cycle of the plant; access to product markets over life cycle of the plant;	<ol style="list-style-type: none"> Brunei is strategically located close to major international shipping lanes and several fast growing Asian economies. Brunei has good quality oil reserves for at least the next 25 years, which would meet the refineries medium term needs. Brunei has several deep water access points for importation of additional crude feedstocks and export of products. Products would be for other domestic (Bruneian) use or in subsequent Hengyi processes. Access to Hengyi plants in China should not be an issue as Brunei is well placed to serve this market. Both domestic demand and that in China should continue to grow as their populations grow and their economies mature.
Discussion: possible issues which affect refinery profitability; human capital resources; any social and political issues.	<ol style="list-style-type: none"> One factor which could affect profitability would be cost of raw materials. One factor which could affect profitability would be labour costs. One factor which could affect profitability would be safety laws. One factor which could affect profitability would be product demand and price. In relation to pt (6), long term contracts could reduce impact of feedstock and product price fluctuations. In relation to pt (7), salaries in Brunei are reasonable and additional labour is available from other Asian countries at reasonable costs. In relation to pt (8) safety laws in Brunei are acceptable but not excessive, whilst environmental laws are "forgiving". Brunei has many young, intelligent and qualified people suitable for employment at an oil refinery. Competition for jobs is increasing in Brunei, so it is likely that the company would be able to choose top employees at reasonable cost. Brunei employees are more likely to remain with their company than employees in some other countries, so staff retention should be very good. Brunei is socially and politically stable, so it is unlikely that the refinery will be affected by outside influences (war etc).
ADDITIONAL	If additional points are raised which you feel are valid information or arguments, you may allocate an extra point.

Appendix C: Student Questionnaire

Student Questionnaire 1

STUDENTS' EXPERIENCES MARKING COURSEWORK USING A RUBRIC

We are interested to find out students' learning experiences at Universiti Teknologi Brunei (UTB) and would like to know a little more about your experiences and how you found today's exercise marking peers coursework using a rubric. There are no right or wrong answers in this questionnaire, and all the information gathered will be dealt with in a confidential manner.

1. Personal Information

- a) Course (FD or PE): _____
- b) Gender: Male Female
- c) What is your mother tongue/first language?
 Malay English Chinese Others, please state: _____

2. Questions

Please tick (✓) your level of agreement on the following statements. Please answer every item by giving your immediate response.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Disagree or Agree	Somewhat Agree	Agree	Strongly Agree
I have undertaken peer assessment previously.							
Peer assessment is a worthwhile activity.							
Giving feedback to my peers is very difficult.							
I feel that my peers have adequate knowledge to evaluate my work.							
I feel that peer assessment is helpful to my learning.							
Giving feedback to my peers is useful to me.							
I would prefer not to do peer assessment on others.							
I prefer peer assessment rather than lecturer's feedback.							
I learnt something through performing peer review.							
Peer assessment activity motivates me to learn.							
I took a serious attitude towards marking peers' work.							
I felt that I was critical of others work when marking it.							

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Disagree or Agree	Somewhat Agree	Agree	Strongly Agree
When marking the coursework, I focused on the task at hand, and did not find my mind wandering to how my own coursework was being marked.							
I learnt something further about the subject through marking coursework using the rubrics.							
Having used the rubrics, I now have a better understanding of what was expected in the coursework							
Having marked coursework using a rubrics, I now have a better understanding of what is expected of me during coursework.							
I think that the rubrics was written in a clear manner which allowed me to accurately assess the work.							
I think that the presentation given at the beginning of the class on how to use rubrics prepared me well enough to assess the work.							
I think rubrics based peer assessment is a fair method to assess student's performance.							
I found the rubrics for the coursework confusing.							
I would like more assessment run in this manner in the future.							

3. Additional comments

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Disagree or Agree	Somewhat Agree	Agree	Strongly Agree
When marking the coursework, I focused on the task at hand, and did not find my mind wandering to how my own coursework was being marked.							
I learnt something further about the subject through marking coursework using the rubrics.							
Having used the rubrics, I now have a better understanding of what was expected in the coursework							
Having marked coursework using a rubrics, I now have a better understanding of what is expected of me during coursework.							
I think that the rubrics was written in a clear manner which allowed me to accurately assess the work.							
I think that the presentation given at the beginning of the class on how to use rubrics prepared me well enough to assess the work.							
I think rubrics based peer assessment is a fair method to assess student's performance.							
I found the rubrics for the coursework confusing.							
I would like more assessment run in this manner in the future.							

3. Additional comments

Decision Making Model of Vietnamese Students Studying Higher Education in England

Minh Hoang
Saigon Institute of Technology, Vietnam

Massoud Moslehpour
Asia University, Taiwan

Victoria Seitz
California State University, San Bernardino, USA

Abstract

Universities in England are now paying more attention to the Vietnamese student market for purposes of campus diversity and recruitment. The primary purpose of this paper is to have a better understanding of Vietnamese students' motives and drives to study abroad. More specifically, this study targets students studying in a public research university in England. To examine Vietnamese students' decision-making processes for choosing a university, the research is conducted in two stages: focus groups and then structured interviews. Findings reveal that the primary reason why Vietnamese students want to study abroad is because of parents' demands and English higher education qualifications. Secondly, it is because they want to achieve better qualifications to improve job prospects. Students do not fully trust agencies; however, they receive the most significant amount of information from agencies and subsequently verify their information with friends, alumni, and other independent authorities. Regarding choosing a university, the first and most influential factor is tuition fees and living costs, followed by course modules. In general, students are satisfied with course modules and services at the university. Although the findings are limited to the sample respondents that were Vietnamese students at this particular university, they are useful for university management and international recruitment offices to improve services provided to students during the recruitment process. This study provides a better understanding of factors influencing Vietnamese international students' decision-making process.

Keywords: decision making process, international students, study abroad, Vietnamese, England

British universities are falling behind international universities in the world. The number of universities and colleges in England with a financial deficit has jumped by almost 70% in just one year (Rhodes, 2019). In real terms, the teaching budget for 2019/2020 is 74% below the 2011/2012 budget (Bolton, 2019). This is raising fears that the British universities' status among the global elite is decreasing (Busby, 2018). With the prospect of a bleak financial outlook and the continued drop in ranking, universities and polytechnics in England are seeking other sources of revenue such as international students. International students are defined as students who sought higher education outside their home country and hold temporary student visas (Andrade, 2006). International students in UK universities are charged higher tuition fees than the local students; as a result, international students contribute a considerable amount of money towards the funds (Binsardi & Ekwulugo, 2003) as well as contribute their talent and bring diversity to campuses (Rhodes, 2019). In 2017, international students contributed more than £25 billion to the economy (Universities UK, 2017). Many other countries have also undertaken various marketing and recruiting activities directed at international students. In 2016, there were over 4.8 million international students, up from 2 million in 2000 (Migration Data Portal, 2017). More than half of these were enrolled in educational programs in six countries: the US, the UK, Australia, France, Germany and the Russian Federation. The UK accounted for around 10% of these international students (Study International News, 2018).

Vietnam is emerging as a country and worth paying attention to. The number of Vietnamese students who choose to study abroad has been increasing gradually year by year. In 2018, approximately 130,000 Vietnamese students studied abroad and spent about USD 4 billion (Vnexpress, 2018). However, only 12,000 Vietnamese students were studying in the UK in 2018 (Ha Phuong, 2018), accounting for only a small percentage of these Vietnamese overseas students. The statistics suggest that the United Kingdom is not as attractive as other countries for Vietnamese students. To attract and to market to Vietnamese students, it is necessary for English universities to understand their perceptions and behaviors in order to attract them. The purpose of this study is to investigate factors influencing university enrolment decision-making processes of Vietnamese students. More specifically, this study will look at Vietnamese students at a public university in England. Privacy and discretion of participants are central to ethical research practice in social research (Wiles, Crow, Heath, & Charles, 2008). This study is a low risk study. However, every effort is made to ensure that the data cannot be traced back to the participants or "the university". To preserve anonymity and confidentiality we use pseudonyms for participants and also for the location of the research.

Literature Review

The decision to study abroad is complex and involves deep deliberation in all stages in the decision-making process. The literature identifies five stages: problem recognition, information search, alternative evaluation, purchase decision, and post-purchase behavior (Solomon, 2017). Most students have limited experience, if any, of overseas higher educational opportunities, so they are involved in extensive information searching (Rafi, 2018). Studying abroad also involves high costs such as tuition fees, living costs abroad, and reduction of savings (Cebolla-Boado, Hu, & Soysal, 2018), as well as cultural and physiological costs (Madden & McMillan, 2018). Hence, students extensively evaluate benefits they might gain during and after studying abroad and subsequently worry about progress and performance in the course (Petzold & Moog, 2018).

Perceptions and behaviors of students are different from country to country. Hence, it is not possible to apply one strategy to all markets (Ma & Garcia-Murillo, 2018). Although overseas students from Asian countries share similarities such as sharing the Confucian heritage and moving to another country with a different culture for study, it would be problematic if these students are seen as homogeneous (Norazlyn, Sweeney, & Soutar, 2016). For instance, Malaysian students are found to be more cost-sensitive than Chinese students and prefer to study in the UK, while the latter favored Australia (Norazlyn et al., 2016). For Singaporean students, the Singaporean dollar stayed strong against the Australian dollar and British pound over the last few years. As a result, more and more of the island country's citizens gained the means to study abroad in the latter two countries (Study International News, 2017).

Problem Recognition and Information Search

When students near the end of high school, they wonder what they want to do with their lives: continue their studies at a university, go to work, or travel. If other students talk about their university plans, this may trigger studying further (Chen & Zimitat, 2006). Parents, especially those from a wealthy and highly-educated background, also play a crucial role in inspiring and supporting students to study overseas (Hulstrand, 2017). Many studies also find that studying abroad is believed to increase job prospects, provide a better opportunity to improve their English language skills, and enhance their understanding of different cultures and traditions (Moogan, Baron, & Harris, 1999). Liwinski (2019) finds that Polish students studying abroad earn, on average, 22 percent more in their first job than those who never studied in a foreign country. Despite the pressure from the government, higher education institutions in Vietnam are unable to provide statistics of employment rates to ensure their graduates' employability (Tong, 2019).

Students primarily receive their information through commercial channels. For instance, recruitment agents can make students' choices easier and the application procedures simpler because they have a vast network to obtain information. However, students also worry that recruitment agents may give false or biased information (Rafi, 2018). University rankings are unbiased reviews from experts to provide students with reliable and comparable information about higher education institutions worldwide, helping them make well-informed choices (Hou, Morse, & Shao, 2012). Electronic sources of information such as forums, blogs, and social networks also play an essential role in the decision-making process of prospective Asian students (Zhu, 2019). Unlike British and European students, Asian students are rarely able to attend open days at universities before deciding which university to choose because of geographic distance, so they rely heavily on the Internet to receive direct information from universities (Marsden, Ibanez-Tirado, McMurray, Yusopov, & Halliel, 2019; Wilkins & Huisman, 2015).

Alternative Evaluation, Purchase Decision, and Post-Purchase Behavior

Medina and Duffy (1998) suggest that evaluative criteria to choose a university involve five primary dimensions: learning environment, reputation, graduate career prospects, destination image, and cultural integration. Students choose English universities because of their reputation; other reasons are the effective and efficient procedures of admissions and immigration, and the opportunity of finding a job while studying in England as well as back in their home countries (Sá & Sabzalieva, 2018). The influence of parents is especially true if they are paying for their children's education, and parents have an immense influence regarding this decision (Hulstrand, 2017). Other factors influencing students' choice of an English university include visa requirements by the UK Border Agency (UKBA), English proficiency,

and evidence of funding (Tannock, 2018). In terms of English proficiency, many empirical studies indicate that English proficiency is an important indicator of academic success for international students (Martirosyan, Hwang, & Wanjohi, 2015). English proficiency plays a crucial role for international students in completing their studies in English language as well as adapting with different educational systems, teaching styles, and relationships with teachers and friends (Martirosyan et al., 2015). For example, those with weak English language skills have poor academic performance because they do not understand well a course's requirements and lessons (Martirosyan et al., 2015). They are also more likely to be isolated from local students and faculty members (Jehangir & Khan, 2015).

Students' educational experiences with a university's academic programs and augmented services provided over the courses influence student satisfaction with the institution (Elsharnouby, 2016). Augmented services consist of administrative services, staff, physical characteristics of academic facilities, and social environment and advising support (Parahoo, Harvey, & Tamim, 2013). Among these augmented services, maintenance activities (i.e., housing, food, and clothing) and campus life (i.e., availability of social and recreational activities, library services, quality of classroom instruction) significantly influence international students' satisfaction (Elsharnouby, 2016). According to Solomon (2017), universities that score high in student satisfaction often have a competitive advantage through an enhanced reputation that aids in the recruitment of additional students. Satisfied students are more likely to communicate openly, make constructive and insightful suggestions to a university, maintain the relationships with their institutions after graduation, and be potential donors in the role of alumni (Parahoo et al., 2013). In contrast, dissatisfied students tend to leave the institutions quietly or share their negative experiences with their circle of friends (Eisingerich, Auh & Merlo, 2013).

Research Method

This study includes two stages: focus groups (qualitative) followed by structured interview surveys (quantitative). We followed the steps suggested by Mack, Woodsong, Macqueen, Guest, & Namely (2005) for focus group qualitative study. In this study non-probability sampling was used with Vietnamese students studying at a public research university in England. Focus group interviews were conducted to have a better understanding of the participants' decision-making processes. The focus group consisted of three males and four females. All participants were obtaining master degrees. The focus group sessions were conducted in English instead of Vietnamese and tape-recorded to avoid biases and inaccuracy. The discussions during focus group sessions were subsequently transcribed verbatim, summarized and grouped into five categories corresponding with the five stages of the decision-making process. These transcripts were analyzed to discover factors and explore themes, patterns, and relationships between factors to form the questionnaire for the structured interviews. For ethical reasons, participants' names and information are kept anonymous. The names mentioned in this study are fictional.

The questionnaire consisted of two main parts. The first part included demographic questions: gender, age, hometown, courses, and financial sources. The second part included identified variables from the focus groups arranged in the five stages of the decision-making process: problem recognition, information search, evaluation, purchase and post-purchase. Statements were measured using multiple-choice, a five-point Likert scale, and ranking. Thirty-three

Vietnamese students agreed and completed the questionnaire in the structured interviews. SPSS was used to analyze the data.

Findings

Qualitative Findings from the Focus Groups

Reasons to study abroad (Problem-Recognition Behavior). Participants note that the Vietnamese education system cannot satisfy their demand in knowledge provision and that the teaching style is passive and boring. Studying abroad is believed to help them gain international educational experience, working with lecturers, tutors, and international students from all over the world. Hence, to them, the Vietnamese labor market seems to favor those with foreign qualifications over those with local ones. Respondents' reasons to study abroad are summarized below:

- “I don't like the Vietnamese teaching style because it lacks communication between students and lecturers”.
- “I think the assessment in Vietnamese universities is unfair because sometimes when I took an exam, I knew about the questions in advance; teachers recycled questions from the previous years, so I can gain a very high mark without studying hard”.
- “I would like to learn some practical things instead of theoretical knowledge as in the Vietnamese education system”.
- “Studying abroad is one of the requirements of my university. To teach my undergraduate students, I, have to get a master degree from a foreign university within three years”.
- “In Vietnam, we don't have two kinds of classes like here (in England): lectures and seminars. We just have lectures in which lecturers keep speaking, and students keep listening”.
- “Vietnam is a developing country and there are an increasing number of foreign companies opening branches in Vietnam. So, if I study abroad, I can have better English and better qualifications to broaden my job opportunities in the future”.
- “The Vietnamese government wants to improve educational quality, so they give a lot of scholarships for students to study abroad”.
- “I think a lot of companies are willing to recruit students who studied abroad. So these students will have more job opportunities with higher salaries than those students studying domestically”.
- “My father really wants me to study abroad to gain the new experience from other foreigners such as living or working styles. He always asked me, "Why don't you study abroad like your friends?" He is willing to support me financially, so I think there is no reason for not going. But I chose where to go”.
- “If around you, a lot of friends study abroad, you also want to study abroad. You also want something similar to what your friends do. It gradually becomes a demand in your mind””
- “If I can pay more than 700 million VND to study abroad, I think I do not need to worry much about the living costs here. But I still want to have a part-time job because I want to socialize with British people to learn more about British culture and life”.
- “The Vietnamese education system is not as good as that in England. Not all international companies accept a Vietnamese degree, but with an English degree, we can apply for any company in the world”.

Information search about universities (Information Search Behavior). Focus group participants collect information from five main sources: friends, agencies, website/Internet, conferences, and university ranking tables. However, all participants consider information from friends the most reliable source. Some participants think that agencies can help save time and prepare profiles properly. Nevertheless, the participants do not fully trust the information provided by agencies because they perceive the information to be distorted to benefit agencies rather than students. Therefore, the participants double-check the information with alumni from the universities where they intend to go in order to compensate for this distortion. Respondents' answers to their source of information are summarized below:

- “At that time, some colleagues of mine already studied at this university and told me that this university is very good. I trusted them. Then I went to the official website of the university to search my course, read requirements, and apply for it. I did not compare this university with others. To me, university ranking is not important because I don't view the university's history important, but I care about its social life.”
- “I searched for information about education in England on the Internet, for example, in some forums”.
- “I searched Google to find some agents who could assist me to prepare documents to study in England”.
- “Moreover, I asked friends on Facebook who used to study in England regarding social life, teaching methods, campuses... On Facebook, I searched the phrase "Vietnamese Student Union in Sheffield", "Vietnamese Student Union in Birmingham", or "Vietnamese Student Union in Manchester" ...”.
- “I also attended several educational conferences to get information and communicate with alumni. Sometimes, I also submitted my CVs there, but I see that my profiles later are handled by an agency”.
- “After I finished my undergraduate degree, I didn't have much time to prepare my application profile and find information about universities in England”.
- “I tried one agency and it persuades me to study at the London Met, but when I came home and searched on the Internet, I received a lot of bad comments about this university. So, I thought this agency was not good. I did not choose the London Met and also changed to another agency. And it was lucky for me when I did not choose it because this university collapsed some months ago”.
- “So, I chose an agency recommended by my cousin. This agency made everything easier for me because they knew almost everything in England. They were very professional and had good relationships with universities in England”.
- “I think the most important source is from my friends because they are my friends and because they are studying there. They know exactly what happens in England, so they can tell me exactly about the social life or teaching styles are”.
- “When I was in Vietnam, I had very little information about what exactly happens here (in England). To me, ranking tables are one reliable source of information about how good a university is”.
- “It is quite convenient to have an agency's assistance. They provided me with information about the English requirements of universities in England, living costs in each city, especially a list of which universities were available for January intake because I started studying in January”.

Why do Vietnamese students choose England? (Alternative-Evaluation Behavior).

Compared to other countries such as the USA and Australia, England is a chosen destination because of its reputation in education, shorter time for studying, lower living costs and tuition fees, and lower English requirements. Other participants also note that they want to improve their English in England – the homeland of the English language and can travel to Europe easily during the summer holiday. Respondents' criteria to choose a university are:

- “I like the structure of modules and the program or courses at this university compared to others. The English requirement is also low, just IELTS 6.0”.
- “I want to study in an English-speaking country because I can improve my English much faster. It is good when this university accepts IELTS 6.0 but such low requirements may affect the quality of learning and teaching”.
- “I compare Australia to England. Both of them have a good reputation in education. However, I choose England because of several advantages. First of all, studying duration in England is less than in Australia. As you know, in Australia, one Master course lasts for one and a half year, so if I learn in England, I can save my money, save time. Second, the exchange rate from AUD to VND or from USD to VND increases; whereas due to Brexit, the exchange rate from GDP to VND decreases, so the total costs for studying in England seems cheaper than other countries”.
- “The agency gave me a list of universities based on my scores, budget, and interest, but I chose this university because my close friend is here. He had been studying in England for 3 months before I came here. I think he could support me when I study here”.
- “My father only wants me to study abroad at an affordable university with a good reputation. Choosing which country or university is my own decision”.
- “The first thing I am concerned with when I choose a university is whether it has an available course in January or not. I had to finish my work before I went to study, so I missed the September intake but I did not want to wait till the next September”.
- “I chose this university because my friends said that this university was more practical than some of the other universities. English requirements here are low also. It is good at the beginning for enrolment, but then it may affect the quality of the programs”.

Satisfaction/dissatisfaction with the current choice (Post-Purchase Behavior). In general, all participants are satisfied with this university. First, they enjoy the small class sizes with 25 or 30 students where they can interact more with fellow students and instructors; in Vietnam, classes have at least 60 or 70 students. Second, teaching methods at this university are more active and practical than in Vietnam with two kinds of classes: lectures and seminars, while Vietnam provides only lecture classes. Third, lecturers and staff are helpful, friendly, enthusiastic, sympathetic toward international students' English skills, and especially reply to inquiries promptly. Fourth, library, online databases (i.e. Library Gateway, Google Scholar, ebooks, ...), computers, or books at this university are considered to be better than in Vietnamese universities. However, some participants note that they are dissatisfied with course programs because the courses are not as practical as they thought and because there are a limited number of optional modules for January intakes compared to September intakes. In addition, some participants complain that there are too many Chinese and Vietnamese students rather than the diversity of students they were seeking. Satisfaction and dissatisfaction of the participants with this university can be summarized as:

- “Small classes with 20-25 students”.

- “One thing that I'm not really satisfied with is the program. I studied Bachelor in International Hospitality and Tourism Management and expected that I could get more real information, more knowledge, and more case studies at the Master course at this university; but when I came here, I just study, write, and read with all subjects which are not really new. I study what I already studied in the bachelor degree program. Nothing new”.
- “I know that the environment with too many Vietnamese students hinders my ability from speaking English. So when I study here, I want to choose a course which has only one Vietnamese student – that's me - in the class. I think I am happier than those students whose courses have more than 10 Vietnamese students. I want to learn more about foreign culture. It doesn't mean that Vietnamese students here are not good; it's just because I want to learn different things”.
- “I think our module looks quite practical, but honestly, it is not that practical. Like my friends, they study in Leicester; they have very good practical modules and long-term projects for finance-and-banking students. At this university, projects are mainly for marketing students”.
- “Our aim is to get practical knowledge to work after we finish the course, not to get a higher degree like a PhD but we don't have enough practical knowledge. It (the knowledge taught at this university) is just based on the books and articles. They are not practical things”.
- “There are quite a lot of Asian people, especially Chinese in my class. They always speak in Chinese. It's very difficult for us to communicate with them”.
- “I think the best place at this university is assets center (library). I have spent quite a lot of time here. I think the technicians and librarians support me quite well. The system sometimes has some small technical problems, but I think it is alright”.
- “There are too many Vietnamese students in my class. I feel that I am studying in a Vietnamese university, not an English university.”
- “I'm January-intake student in Finance and Banking. I see that a September intake has about five or six optional modules to choose, and those modules are very exciting, while my course has only two optional modules”.
- “I will consider a prospective student's ability first before I recommend this university to their friends and relatives. If he or she wants to gain practical knowledge and had an average ability and budget, I am willing to recommend this university. However, if he or she has a higher ability to study, larger budget, or want to gain better academic knowledge, I would recommend other universities with a higher rank in university ranking tables”.

Quantitative Findings from the Structured Interviews

The sample size was 33 people with over 90% between the ages of 22 and 28, and two thirds (63.64%) females. Almost all (97%) were studying for their master's with the remaining studying other qualifications such as bachelor's degree, PhD, or English certificates at this university. Approximately 85% of interviewees earned their last degree in Hanoi with the remaining from other provinces in Vietnam such as Ho Chi Minh City, Da Nang, or Can Tho, suggesting that the students in Hanoi seem to favor England more than students in other provinces. Nearly 80% were sponsored by their parents, indicating that financial support from families is very important. Finally, two-thirds of the respondents are studying in January intake.

Problem recognition. The data, as shown in Table 1, indicate that parents trigger the demand for studying abroad in students with 24.2% Strongly Agree and 60.6% Agree, while friends do not really influence at this stage (48.5% Disagree and 12.1% Strongly Disagree). English higher education qualifications are considered to be more valuable than Vietnamese qualifications (94% Agree and Strongly Agree).

Table 1: Reasons for the decision to study abroad

Statement No.		SA	A	UN	D	SD
1. The Vietnamese education system cannot satisfy my demand in knowledge provision.	n	5	12	9	7	0
	%	15.2	36.2	27.3	21.2	0
2. My company requires me to have a foreign higher education degree.	n	2	10	11	11	0
	%	6.1	30.3	30.3	33.3	0
3. English higher education qualifications are more valuable than Vietnamese qualifications.	n	17	14	1	0	1
	%	51.5	42.5	3.0	0	3.0
4. A lot of my friends study abroad, so I want to study abroad, too.	n	4	5	4	16	4
	%	12.1	15.2	12.1	48.5	12.1
5. My parents always encourage me to study further, especially studying abroad.	n	8	20	4	1	0
	%	24.2	60.6	12.1	3.0	0
6. I come of age to live independently from my parents and experience a new culture.	n	11	20	2	0	0
	%	30.3	66.6	6.1	0	0

Information search. Friends, Website/Internet, and Agencies appear to be the three most important sources with 81.8%, 75.8%, and 72.7% respectively. However, as demonstrated in Table 2, the difference between sources of information is minimal.

Table 2: Source of information for the decision to study abroad

	Friends		Agencies		Website/Internet		Conferences		University Ranking	
	n	%	n	%	n	%	n	%	n	%
Yes	27	81.8	24	72.7	25	75.8	17	51.5	22	66.7
No	6	18.2	9	27.3	8	24.2	16	48.5	11	33.3
Total	33	100	33	100	33	100	33	100	33	100

Table 3 shows that Tuition Fees/ Living Costs, Course Modules/ Programs, and Facilities are considered to be the most important criteria for the students seeking to study (84.8%, 87.9% and 87.9% respectively).

Table 3: Criteria for the decision to choose university abroad

	Tuition fees & living costs		Scholarship/ financial aids		Teaching methods		Course modules/ programs		Lecturers & staff		University reputation		Facilities	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Yes	28	84.8	22	66.7	25	75.8	29	87.9	21	63.6	21	63.6	29	87.9
No	5	15.2	11	33.3	8	24.2	4	12.1	12	36.4	12	36.4	4	12.1
Total	33	100	33	100	33	100	33	100	33	100	33	100	33	100

Alternative evaluation. The most influential factor for choosing a university in UK is the shorter duration of the master's degree programs compared to other countries (81.8% Strongly Agree and Agree), but tuition fees and living costs are not (48.5% Disagree and Strongly Disagree). This result agrees with the findings in the focus groups that finds England is chosen because of the duration of courses in England is less than that in other countries. Most of the participants agree that they choose England because of job prospects, English improvements, cultural experience, English requirements and travelling as shown in Table 4.

Table 4: Reasons for the decision to choose an English university

Statement No.		SA	A	UN	D	SD
9. I want to improve my job prospects	n	20	13	0	0	0
	%	60.6	39.4	0	0	0
10. English qualifications are recognized over the world	n	12	19	2	0	0
	%	36.4	57.6	6.1	0	0
11. The duration for higher education programs in England is less than in other countries.	n	13	14	4	2	0
	%	39.4	42.4	12.1	6.1	3.0
12. Tuition fees and living costs in England are less than in other countries	n	1	8	8	13	3
	%	3.0	24.2	24.2	39.4	9.1
13. I want to improve English in the homeland of this language	n	16	12	5	0	0
	%	48.5	36.4	15.2	0	0
14. I want to experience Western culture	n	9	17	6	1	0
	%	27.3	51.5	18.2	3.0	0
15. English higher education requires only IELTS whereas other countries such as the USA require more certificates such as TOEFL, GMAT, or GREE	n	3	13	10	6	1
	%	9.1	39.4	30.3	18.2	3.0
16. I want to travel in Europe while studying in England	n	7	18	7	1	0
	%	21.2	54.5	21.2	3.0	0

The most important factor to choose this university is low tuition fees and living costs (87.9%), followed by interesting course modules (75.8%). The influence of friends is the least important factor (18.2%).

Table 5: Factors influencing students to choose this English university

	January intake		Interesting course modules		Practical teaching methods		Tuition fees & living costs		Requirement in IELTS		Scholarship & financial aids		My friends studying here	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Yes	19	57.6	25	75.8	19	57.6	29	87.9	16	48.5	14	42.4	6	18.2
No	14	42.4	8	24.2	14	42.4	4	12.1	17	51.5	19	57.6	27	81.8
Total	33	100	33	100	33	100	33	100	33	100	33	100	33	100

Purchase decision. This part examines who influenced students' decision to choose this public university. The data shown in Table 6 indicate that parents, friends and alumni are most influential with 48.50%, 54.50% and 33.30%, respectively.

Table 6: Individuals influencing a student to make this decision

	My parents		My friends		My other family members such as brothers, sisters, or cousins		My teachers		My boss		Alumni	
	n	%	n	%	n	%	n	%	n	%	n	%
Yes	16	48.5	18	54.5	8	24.2	9	27.3	4	12.1	11	33.3
No	17	51.5	15	45.5	25	75.8	24	72.7	29	87.9	22	66.7
Total	33	100	33	100	33	100	33	100	33	100	33	100

Post-Purchase Behavior. The findings shown in Table 7 indicate that Vietnamese participants do not like too many Chinese students in the class (78.8% Strongly Agree and agree). They also report that they want to have more Western students (45.5% Strongly Agree and 42.4% Agree). In general, this university has received very good feedback from participants, including suitable course (84.9% for Strongly Agree and Agree), helpful and friendly staff and lecturers (84.9% for Strongly Agree and Agree), good facilities (78.8% Strongly Agree and Agree), peaceful campus and nice local people (72.7% Strongly Agree and Agree).

Table 7. Students' satisfaction with their choice of this university

Statement No.		SA	A	UN	D	SD
19. The course program is very suitable for my ability	n	5	23	3	1	1
	%	15.2	69.7	9.1	3.0	3.0
20. Staff and lecturers are very helpful and friendly	n	6	22	4	1	0
	%	18.2	66.7	12.1	3.0	0
21. Facilities such as the library, computers, or books are very good	n	10	16	6	1	0
	%	30.3	48.5	18.2	3.0	0
22. This city is peaceful and local people are very nice and friendly.	n	7	17	5	2	2
	%	21.2	51.5	15.2	6.1	6.1
23. The course is not as practical as I expected	n	2	8	10	11	2
	%	6.1	24.2	30.3	33.3	6.1
	n	8	11	11	3	0

24. There is a limited number of optional modules for January-intake students (If you are a January-intake student)	%	24.2	33.3	33.3	9.1	0
25. There are too many Chinese and Vietnamese classmates	n	16	10	3	3	1
	%	48.5	30.3	9.1	9.1	3.0
26. I wish my class would have more Western students	n	15	14	4	0	0
	%	45.5	42.4	12.1	0	0

Discussion

Problem Recognition

Results from the focus groups and structured interviews reveal two important interdependent details. First, the Vietnamese educational system, employers' requirements, and preferences toward English qualifications over local qualifications trigger Vietnamese students to study abroad. Secondly, Vietnamese students believe that English qualifications can improve their job prospects. English language skills provide opportunities for exchange of cultures as well as travel while studying. These findings point to the fact that Vietnamese students prefer overseas education qualifications to local qualifications.

Nearly 80% of the participants studying at this university are sponsored by their parents. Results from the quantitative data indicate that parents strongly influence students to study abroad, but friends do not. Findings fully support the research of Hulstrand (2017) and Wadhwa (2016) regarding the role of parents, but challenge the research of Chen & Zimitat (2006) in terms of the role of friends. Hence, it is important to inform and communicate with Vietnamese students' parents as well.

Information Search

Results show that Vietnamese students seek information from many sources such as friends, agencies, website/Internet, conferences, and university ranking tables. The participants receive the largest amount of needed information from agencies, but check again with their friends and alumni from the universities where they want to study. Prospective students trust that the information coming from personal sources (friends, family) or public sources (student associations, university rankings) are independent and unbiased. This supports the findings of Rafi (2018) and Wadhwa (2016). They argue that friends and relatives are the primary sources of information used by prospective students followed by institutional coaching centers, the Internet, agents and education fairs. Hence, the university should have a close relationship with agencies and should build a strong alumni network for their significance to gain the trust of prospective students and support information from agencies.

Alternative Evaluation

Focus group results (stage 1) indicate several factors influencing the choice of England over other countries. These factors include worldwide-recognized qualifications, shorter course duration, lower tuition fees and living costs, the homeland of the English language, ease of application procedures, and ease of travelling around Europe. In addition, some participants mentioned Brexit, which caused the low exchange rate from GDP to VND, benefiting Vietnamese students to study and spend in England. Except for low tuition fees and living costs, results agree with the finding from the structured interviews. Hence, universities should

carefully review tuition fees and living costs in England compared with those in the USA and Australia to attract international students.

Reasons to choose this public research university over others in England are low tuition fees and living costs, practical teaching methods, January intakes, lower English requirements, a larger number of scholarships and financial aid, and friends currently studying at this university. From the structured interview results, low tuition fees/living costs are the two most important factors to choose this university. This suggests the university appeals more to Vietnamese students who are cost-sensitive. Respondents recommend this university to those prospective students who have average ability and limited budget. These findings are consistent with Wadhwa (2016) who found that tuition and institution fees, availability of scholarships and financial aid, and quality of faculty influenced students to choose a particular host institution. Lee (2014) also found that cost issues most influenced international students' decision-making processes whereas recommendation from others was the least important. This suggests that the affordability of the university appeals to the Vietnamese students who are cost-sensitive.

Post-Purchase Behaviour

The participants consider the quality of course modules much more critical than university services, given that the degree quality would positively affect their job prospects. However, they find it hard to evaluate the degree quality because they are still studying at this university and job prospects are in the future. Therefore, participants tend to examine their satisfaction or dissatisfaction based on the immediate environment or factors such as courses, lecturers, facilities, and classmates. This finding supports the outcomes of the Medina and Duffy (1998) study. In general, participants are satisfied with the university's course modules, library, local people and a peaceful city.

Lower English requirements are one of the reasons that participants choose this public research university, but such low standards may restrict Vietnamese students from participating in class and socializing with local people, leading them to isolation or mental problems. This finding is fully consistent with Martirosyan et al. (2015) and Jehangir and Khan (2015). In the long run, this issue may erode perceived satisfaction among students. Vietnamese students want to associate with more Western rather than Asian students to improve their English and cultural exchange; however, their courses are dominated by Chinese and Vietnamese students.

Conclusion

English university qualifications are perceived as more valuable than Vietnamese university qualifications. Also, the Vietnamese Dong has stayed strong against the British pound over the last few years, which makes British universities more affordable to Vietnamese students. English universities should take advantage of this point to promote higher education programs to Vietnamese students. English universities can not only attract students to England, but also export the programs to Vietnam through dual-degree programs with Vietnamese universities. Such a strategy would help some Vietnamese students solve some problems related to visa requirements, English proficiency and evidence of funding as requested by UK Border Agency. These dual-degree programs may also avoid brain drain and immigration issues in England after students' graduation.

As parents are the major sponsors for Vietnamese students to study abroad, marketing strategies should address both students and parents. The information provided by friends, alumni, or independent authorities such as university ranking establishments is more credible than commercial agencies. Therefore, English universities should build close relationships with alumni networks and build reputation and recognition from trusted independent authorities.

The two most important factors in choosing this university are low tuition fees and living costs. This university seems to attract students who are cost-sensitive with average ability. To attract more talented students, the university should provide more financial aid to students.

Regarding post-purchase behavior, the core benefit of English qualifications is job prospects. However, students find it hard to determine that while they are still studying. Hence, students tend to evaluate their satisfaction or dissatisfaction based on the surrounding environment. Students' observations include: course modules, financial, employment opportunities while in school and after graduation. Furthermore, students rely on well-informed advisors to help them adjust to course modules, the knowledge conveyed, teaching methods, and classmate diversity. In general, Vietnamese students are satisfied with course modules and services at this university. However, some students are worried about low requirements for English capacity for international students that may negatively impact their learning quality in higher education. They are also worried about social isolation from local students. Thus, pairing international and host students may assist international students to adapt to the new culture and learning methods better. Moreover, Vietnamese students have a desire to associate with Western students rather than Asian students (i.e., Chinese or other Vietnamese students) to improve their English and cultural exchange. Given this, universities may wish to implement a diversification strategy in student recruitment to provide a diverse student body of domestic and international students.

References

- Andrade, M. S. (2006). International students in English-speaking universities: Adjustment factors. *Journal of Research in International Education*, 5(2), 131–154. <https://doi.org/10.1177/1475240906065589>
- Binsardi, A. and Ekwulugo, F. (2003). International marketing of British education: Research on the students' perception and the UK market penetration. *Marketing Intelligence and Planning*, 21(5), 318–327. <https://doi.org/10.1108/02634500310490265>
- Bolton, P. (2019). *Higher education funding in England*, The House of Commons Library Briefing Paper, Number 7393. <https://researchbriefings.parliament.uk/ResearchBriefing/Summary/CBP-7973>
- Busby, E. (2018). UK universities drop in global reputation rankings for research and teaching, *Independent*. Retrieved from <https://www.independent.co.uk>
- Cebolla-Boado, H., Hu, Y. & Soysal, Y. N. (2018). Why study abroad? Sorting of Chinese students across British universities. *British Journal of Sociology of Education*, 39(3), 365–380. <https://doi.org/10.1080/01425692.2017.1349649>
- Chen, C. H., & Zimitat, C. (2006). Understanding Taiwanese students' decision-making factors regarding Australian international higher education. *International Journal of Educational Management*, 20(2), 91–100. <https://doi.org/10.1108/09513540610646082>
- Eisingerich, A. B., Auh, S., & Merlo, O. (2013). Acta non verba? The role of customer participation and word of mouth in the relationship between service firms' customer satisfaction and sales performance. *Journal of Service Research*, 17(1), 40–53. <https://doi.org/10.1177/1094670513490836>
- Elsharnouby, H. T. (2016). Participation behavior among international students: The role of satisfaction with service augmentation and brand choice attainment. *International Journal of Educational Management*, 30(5), 679–697. <https://doi.org/10.1108/IJEM-10-2014-0139>
- Ha Phuong. (2018). Vietnam has 12,000 students in the UK. *HanoiTimes*. Retrieved from <http://www.hanoitimes.vn>
- Hou, A. Y.; Morse, R., & Shao, Y. E. (2012). Is there a gap between students' preference and university presidents' concern over college ranking indicators? A case study of "College Navigator in Taiwan". *Higher Education*, 64(6), 767–787. <https://doi.org/10.1007/s10734-012-9524-5>
- Hulstrand, J. (2017). Working with parents: Strategies for success. *International Educator*, 26(3), 60, 62–63.
- Jehangir, M. & Khan, R. (2015). English language proficiency: Social and academic adjustment of Pakistani postgraduate students abroad. *Journal of Humanities and Social Sciences*, 23(2), 73–82.
- Liwinski, J. (2019). Does it pay to study abroad? Evidence from Poland. *International Journal of Manpower*, 40(3), 525–555. <https://doi.org/10.1108/IJM-11-2017-0305>
- Ma, Y. & Garcia-Murillo, M.A. (Eds.). (2018). *Understanding international students from Asia in American universities*. Switzerland: Springer International Publishing.

- Mack, N., Woodsong, C., Macqueen, K. M., Guest, G., & Namely, E. (2005). *Qualitative research methods: A data collector's field guide*. California: Family Health International.
- Madden, T. M., McMillan, A., & Madden, L. T. (2018). This is not a vacation: The shadow side of study abroad programs for faculty. *Journal of Management Education*, 43(2), 185–199. <https://doi.org/10.1177/1052562918815212>
- Marsden, M., Ibanez-Tirado, D., McMurray, J., Yusupov, D., & Halliel, S. (2019). *Commissioned report for the Eurasian Council on Foreign Affairs – everyday diplomats: new perspectives on networks, commerce, and regional integration in Central Asia*. Technical Report. Eurasian Council of Foreign Affairs. <http://www.eurasiancouncilforeignaffairs.eu/wp-content/uploads/2018/11/2.-Eurasian-Council-on-Foreign-Affairs-July-2018.pdf>
- Martirosyan, N. M., Hwang, E., & Wanjohi, R. (2015). Impact of English proficiency on academic performance of international students. *Journal of International Students*, 5(1), 60–71. <https://doi.org/10.32674/jis.v5i1>
- Medina, J. F. & Duffy, M. F. (1998). Standardisation vs globalisation: A new perspective of brand strategies. *Journal of Product & Brand Management*, 7(3), 173–178. <https://doi.org/10.1108/10610429810222859>
- Migration Data Portal (2017). *International students*. Retrieved from <https://migrationdataportal.org/themes/international-students>
- Moogan, Y. J., Baron, S. & Harris, K. (1999). Decision-making behavior of potential higher education students. *Higher Education Quarterly*, 53(3), 211–228. <https://doi.org/10.1111/1468-2273.00127>
- Norazlyn, K. B., Sweeney, J. C., & Soutar, G. N. (2016). International students' university preferences: how different are Malaysian and Chinese students? *The International Journal of Educational Management*, 30(2), 197–210. <https://doi.org/10.1108/IJEM-08-2014-0122>
- Parahoo, S., Harvey, H. & Tamim, R. (2013). Factors influencing student satisfaction in universities in the Gulf region: does gender of students matter?, *Journal of Marketing for Higher Education*, 23(2), 135–154. <https://doi.org/10.1080/08841241.2013.860940>
- Petzold, K., & Moog, P. (2018). What shapes the intention to study abroad? An experimental approach. *Higher Education*, 75(1), 35–54. <https://doi.org/10.1007/s10734-017-0119-z>
- Rafi, M. (2018). Influential factors in the college decision-making process for Chinese students studying in the U.S. *Journal of International Students*, 8(4), 1681–1693. <http://doi.org/10.5281/zenodo.1468068>
- Rhodes, D. (2019). Number of English universities in financial deficit increases. *BBC News*, Retrieved from <https://www.bbc.com>
- Sá, C. M., & Sabzalieva, E. (2018). The politics of the great brain race: public policy and international student recruitment in Australia, Canada, England and the USA. *Higher Education*, 75(1), 231–253. <https://doi.org/10.1007/s10734-017-0133-1>

- Solomon, M. R. (2017). *Consumer behavior: Buying, having, and being*. New Jersey: Pearson Education.
- Study International News. (2017). *More Singaporeans head to Australia, UK for studies as currency stays strong*. Retrieved from <https://www.studyinternational.com>
- Study International News. (2018). *Which country is home to the largest international student population?*. Retrieved from studyinternational.com
- Tong, L. (2019). Graduate employment in Vietnam. *International Higher Education*, 97, 23–24. <https://doi.org/10.6017/ihe.2019.97.10948>
- Vnexpress. (2018). *Vietnamese families splurge \$4 billion per year on education abroad*. Retrieved from <https://e.vnexpress.net/>
- Tannock S. (2018). International students in the UK: Caught between market forces and immigration targets. In S. Tannock, *Educational equality and international students*, (pp. 39–67). Cham, Switzerland: Palgrave Macmillan..
- Universities UK (2017). *International students now worth £25 billion to UK economy – New research*. Retrieved from <https://www.universitiesuk.ac.uk>
- Wadhwa, R. (2016). Students on the move: Understanding decision-making process and destination choice of Indian students. *Higher Education for the Future*, 3(1), 54–75. <https://doi.org/10.1177/2347631115610221>
- Wilkins, S., & Huisman, J. (2015). Factors affecting university image formation among prospective higher education students: the case of international branch campuses. *Studies in Higher Education*, 40(7), 1256–1272. <https://doi.org/10.1080/03075079.2014.881347>
- Wiles, R., Crow, G., Heath, S., & Charles, V. (2008). The management of confidentiality and anonymity in social research. *International Journal of Social Research Methodology*, 11(5), 417–428. <https://doi.org/10.1080/13645570701622231>
- Zhu, Y. (2019). Social media engagement and Chinese international student recruitment: Understanding how UK HEIs use Weibo and WeChat. *Journal of Marketing for Higher Education*, 29(2), 173–190. <https://doi.org/10.1080/08841241.2019.1633003>

Corresponding author: Massoud Moslehpour

Contact email: writetodrm@gmail.com

Academic Staff Induction and Assessment on Implementing Experiential Learning and Reflective Practice

Vera Maria Nistor
Otago Polytechnic, Auckland International Campus
New Zealand

Don Amila Sajeevan Samarasinghe
Otago Polytechnic, Auckland International Campus
New Zealand

Abstract

Experiential learning and reflective practice are two effective key learning and teaching strategies that many successful teachers employ as learner-centred education practices. It has been proven that many students appreciate the meaningful learning received through a learner-centred classroom environment.

The aim of this paper is to share the findings of an induction programme focussing on experiential learning and reflective practice, which was designed to enhance the importance of transforming teacher-centred practice into learner-centred practice, with the teacher taking on the role of facilitator. The objectives of this induction programme were to help staff in understanding and incorporating experiential learning models in their teaching practice at a New Zealand tertiary institution.

The paper contains a qualitative analysis of staff perspectives on experiential learning practice taken from their answers to a questionnaire, which followed an online Moodle course. It also contains a quantitative analysis of the data gathered from classroom observations using a digital classroom observation tool for assessment.

The results showed that, although theoretical awareness about experiential learning was not a problem for new academic staff, its practical application was not always fully achieved. Even when lecturers were successfully implementing experiential learning activities in their classes, they were not incorporating reflective practice as part of a complete process. A more conscious incorporation of reflective practice by the academic staff in their classes, will ultimately help students to continue learning through experiences and reflection in their self-directed learning journeys.

Keywords: experiential learning, reflective practice, staff induction programme, teacher performance

Experiential learning and reflective practice are the key drivers for bringing an authentic and learner-centred environment into classroom practices (Beard & Wilson, 2015; Moon, 2004). This is probably why experiential learning is part of many tertiary institutions' curriculum requirements nowadays, as a preferred learning and teaching method.

The basis for experiential learning is the constructivist belief (Vygotsky, 1978) that students learn best by trialling and experimenting with what they are taught, rather than by passively observing or listening to the teacher. Many teaching practitioners seem to understand experiential learning as “learning through reflection on doing” (Felicia, 2011, p. 1003). Yet, in order for the students to obtain a complete learning experience using this method, their experiential learning tasks need to be accompanied by a reflective session (Moon, 2004).

In modern teaching practice, experiential learning involves problem-solving learning experiences (Miller & Maellaro, 2016) and co-created learning experiences that enhance student capabilities and transferable skills (Stephenson, 1998). This would ideally enable students to understand how they learn and how to continue to learn, and hopefully also positively contribute to their future employability.

This paper aims to share the findings of a trial induction programme designed to assess the extent to which academic staff at a New Zealand tertiary institution are employing experiential learning activities within their regular classes. The main objective of the induction programme was to support new academic staff members at our New Zealand tertiary institution and enhance their understanding of experiential learning models, incorporation of experiential learning and reflective practice into the courses, and contextualising experiential learning within the institution's learner capabilities framework. This framework was designed to offer students the necessary knowledge and skills to become successfully employed in their field in the future. The trial induction programme was run by the authors as peers within our institution, coming from different teaching backgrounds and subjects (the experiential learning team). Based on a continuing trend for tertiary educators to deliver their classes in a teacher-centred way, this trial induction programme was designed to try and change their perception and to show (mainly through professional conversations with the experiential learning team) that students would get better learning opportunities through a more practical, experiential learning strategy.

The paper explores both teaching practitioners' reflection on what experiential learning means for them, as well as the practical task of applying and incorporating this model into their daily teaching practice. Conclusions are drawn from the findings on both aspects, and some recommendations for the future are made on how a more comprehensive experiential learning curriculum could be further achieved.

Literature Review

Experiential Learning

In education, Kolb's learning cycle of experiential learning (1984) is one of the most well-known experiential learning models. According to this model (based on Lewin's 1951 experiential learning model), experiential learning follows a continuous learning cycle which revolves around having concrete experiences (doing), reflecting on these experiences (reflective observation), followed by processing this information and understanding linkages (abstract conceptualisation), and eventually planning and trying out what has been learnt within other contexts (active experimentation). Summarising Dewey's classic model of the learning

process, Kolb (2015) concluded that experiential learning is a type of learning that “transforms the impulses, feelings, and desires of concrete experiences into higher-order purposeful action” (p. 33), which shows the transferability of these experiences. Not unlike the abstract conceptualisation stage in Kolb’s model, Boud’s model of learning from experience also stresses the fact that students come with existing knowledge or a personal foundation of experience (Boud, 1994) and all new knowledge needs to be assimilated through this already existing knowledge, in order for successful acquisition of knowledge to occur. Prior learning and new learning are grounded in experience and reflective practice. An important idea to consider here is that learning is a personal matter and not every student learns the same way (Beard & Wilson, 2015). This idea supports Gardner’s well-known theory of multiple intelligences (1999), which argues that different students can prefer to learn in seven different ways (such as linguistic, logical-mathematical and bodily-kinaesthetic), depending on their type of intelligence.

Experiential learning activities are commonly classified into two different types: field-based learning and classroom-based learning (Lewis & Williams, 1994). This stresses the practicality of this model of learning, and shows how experiential learning does not need to stop within a traditional classroom-based educational model. Beard and Wilson (2015) list a number of different types of field-based activities that could be experiential, such as adventure learning through outdoor team activities, dramaturgy and field trips. Experiential learning comes with interactivity and participation, and is considered more effective than traditional learning approaches.

Reflection in Experiential Learning

In spite of its growth in popularity, there has been criticism of some teaching practitioners misunderstanding the real meaning of experiential learning. Beard and Wilson point out the risk of an activity trap, where teachers use a multitude of experiential learning tasks in their classes, but these turn out to be uncritical activities, devoid of any reflective component (2015, p.124). Ultimately, without reflection, students might not even end up learning from doing experiential tasks in the classroom.

Reflection is a way of learning through thinking. Dewey (1938, p. 9) defined reflection as “the active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends”. There are two major ways of reflection: reflection in action and reflection on action (Schon, 2017). Reflection in action refers to the sequence of thoughts we have while doing an action. Reflection on action refers to the reconstruction process of the action once it has been concluded, to draw lessons from the experience (Brookfield, 2017). What both of these types of reflection have in common is the processing of information based on an event that is occurring or has occurred, in order to learn from it. It is what Moon calls “cognitive housekeeping” or “sorting out of bits of knowledge, ideas, feelings, awareness of how you are behaving and so on”. (Moon, 2004, p.187).

Depending on its depth, reflection can be categorised into descriptive writing, descriptive reflection, dialogic reflection and critical reflection. Descriptive writing refers to shallow descriptions that do not include a discussion about what happened. Therefore, it does not involve reflection. In descriptive reflection, there is a description of events. However, only one perspective is acknowledged. Dialogic reflection analyses multiple perspectives outside the events discussed, demonstrating an in-depth reflective result. In critical reflection, actions and events are deeply analysed by multiple perspectives located in and influenced by historical and

social-political contexts (Moon, 2004). Critical reflection would therefore help to create more democratic and inclusive classroom environments (Brookfield, 1995). Moon (2004) argued that reflection could deliver unexpected outcomes (ideas that could have been solutions to dilemmas, creative activities), emotions and recognise the need for further reflection. Therefore, reflection is not only part of a good quality learning process but also important in learning behaviour development (Brookfield, 1995).

It has been noticed that, even though reflection occurs as a natural phenomenon, it is rarely brought up for critical discussions with learners (Cavilla, 2017). Therefore, lecturers might need to review their teaching practice and improve the reflection activities they use in their classes. For instance, it would be good practice to include weekly reflective journals in any type of class, irrespective of the subject taught. Forums, and question and answer sessions, can also be set up in which learners can share their ideas on reflective practices. Boud (2010) argued that when reflecting, the emotions that are associated with the event must be considered (such as fear, panic hesitation, calm or elation). Emotion plays a vital role in quality reflection, as feelings are part of any genuine reflection (Boud, 2010; Pedler, 2011). Therefore, it is suggested to slow down the pace of learning and encourage more emotion to make meaning out of experiences (Moon, 2004). Engaging emotions in reflective sessions would enable both students and lecturers to validate the findings from reflective activities. Eventually, both students and lectures would engage in reflective practices naturally. Ideally, reflection should happen regularly as part of everyday learning (Moon, 2004).

Post-Observation Staff Reflection

The values and beliefs of a lecturer determine their philosophy (Schonell et al., 2016). Post observation reflective sessions could help lecturers to discuss and understand what is essential in the delivery of quality education. Upon understanding what values lecturers hold, they can then develop good relationships with their students, which would grow over time and which would result in an environment conducive to learning (Hamre & Pianta, 2006). The post observation reflective session would ideally also encourage lecturers to reassess their passion for teaching. Similarly, Rashidi and Moghadam (2014) argued that there is a positive correlation between a teacher's sense of complacency and poor student achievement. In order to keep themselves up-to-date through professional development activities, lecturers could benefit from being observed by peers, such as learning and teaching teams, who can provide them with constructive feedback (Ahmed, Nordin, Shah, & Channa, 2018).

Experiential Learning Staff Induction Process

The induction programme was designed in four main stages. It was aligned with the staff peer observation model proposed by Murphy Tighe and Bradshaw (2013) which included preparation, pre-observation meeting, observation and post-observation feedback session.

In the first stage, staff were introduced to experiential learning and reflective practice through an online activity (a short Moodle course with videos and other reading materials). The key objectives of this course were:

- To help the staff to understand what experiential learning means;
- To support the staff in developing ways to incorporate experiential learning and reflective practice into their courses;
- To encourage the staff to contextualise experiential learning within the capabilities' framework.

This was intended to have them experience the process by themselves. Following the online course, the participants had to complete an online questionnaire (eight questions), testing their general knowledge on experiential learning. An automatic email was generated to the experiential learning team when the questionnaire was submitted.

The second stage of the induction programme was a face-to-face reflective session with the experiential learning team, to clarify any specific issues the staff might have had on experiential learning practice following the online course and questionnaire. Staff were then asked to come up with potential ways of incorporating experiential learning activities into their respective courses.

In the third stage, a class observation, using a digital observation tool, completed the induction programme. They were primarily observed on their application of experiential learning activities. The observation tool captured the learning environment in terms of the different types of learner-centred (including experiential learning and reflection) or teacher-centred activities and the positions of the classroom facilitator. It also provided a map of teachers' movements in the classroom every 30 seconds.

The fourth and final stage of the induction programme was a face-to-face reflective session with the experiential learning team to discuss feedback from the class observations. This session was designed to reflect on the class observation results. It provided opportunities for both observer and teacher to discuss their approach to experiential learning and reflective practice and create a development plan for future improvement.

Research Methods

The staff induction programme was initiated by and conducted with the approval of the academic board of our institution. The research participants were informed in advance about the purpose of the staff induction programme, how it was going to be conducted and what was expected of them. The primary data (from the online questionnaire and class observations) were collected in a responsible and ethical manner by using codes instead of participants' names, thus ensuring that their anonymity and confidentiality remained unaffected at all times.

There were 16 new staff members who went through our experiential learning induction process. Our findings from the induction process included both qualitative and quantitative data. A mixed-method analysis was employed to analyse both qualitative and quantitative research findings as it helped to optimise the benefits of both methods (Morgan, 2007). In other words, we increased the validity of our research findings by triangulating qualitative data collected from the online course with quantitative data collected from the class observation results (Bryman, 2016).

The qualitative information received from the online course was analysed using content analysis in order to discover what academic staff knew about experiential learning and reflective practice in theory. The responses received for the eight online questions were tabulated. They were then summarised based on the themes that emerged. It should be noted that one participant might have provided more than one response to a question asked. Therefore, in each question, the popularity of a theme was calculated as a percentage of the total number of responses received. The themes were then ranked based on their popularity to identify the significant themes generated from the online questions. The themes generated are shown in Figures 1-8.

The quantitative data captured by the digital observation tool was statistically analysed to explore the extent to which academic staff applied their theoretical knowledge about experiential learning and reflective practice to their classes. This was done by identifying the frequency of teacher-centred and learner-centred class activities demonstrated during class observations (as shown in Figure 9). The legend for these different types of activities incorporated within the observation tool is shown in Figure 10.

Results

Qualitative Data Analysis and Findings

This section presents the results generated from the qualitative analysis of the responses received from the first stage of the induction programme. As mentioned above, there were eight questions related to experiential learning and reflective practice. The responses are shown in order of popularity (from the most popular to the least popular). The responses with less than 5% popularity were eliminated.

Question 1: What is experiential learning and why is it important?

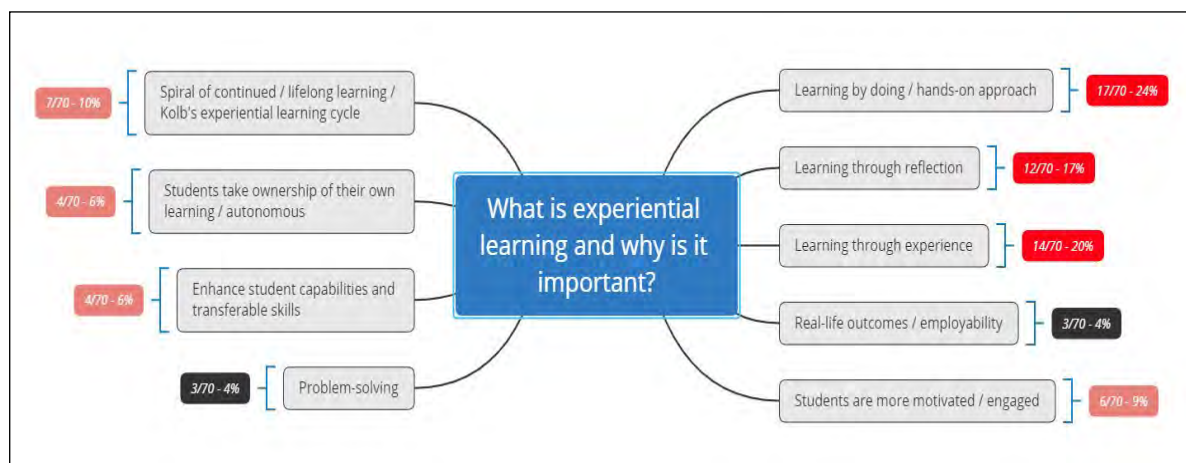


Figure 1: The definition of experiential learning and its importance

The most popular response (24%) was that experiential learning suggests a hands-on approach, in which students learn by doing, as well as through reflection (17%) and having relevant experiences in the classroom (20%). One participant said:

“As a natural model it mimics what happens to us unconsciously anyway and makes that process conscious to us”.

Many participants also believed that the concept suggests a spiral of continued lifelong learning (10% of responses - some alluding to Kolb’s experiential learning cycle), and that students are generally more motivated to learn in this way (9%). Some also believed that experiential learning makes students become more autonomous (6%) and enhance their capabilities and transferable skills (6%). Another participant added:

“Experiential learning provides learners access to each stage of problem-solving, and extends the learning experience from limited school life to life-long period”.

Question 2: What makes the experiential approach different from conventional approaches to tertiary education?

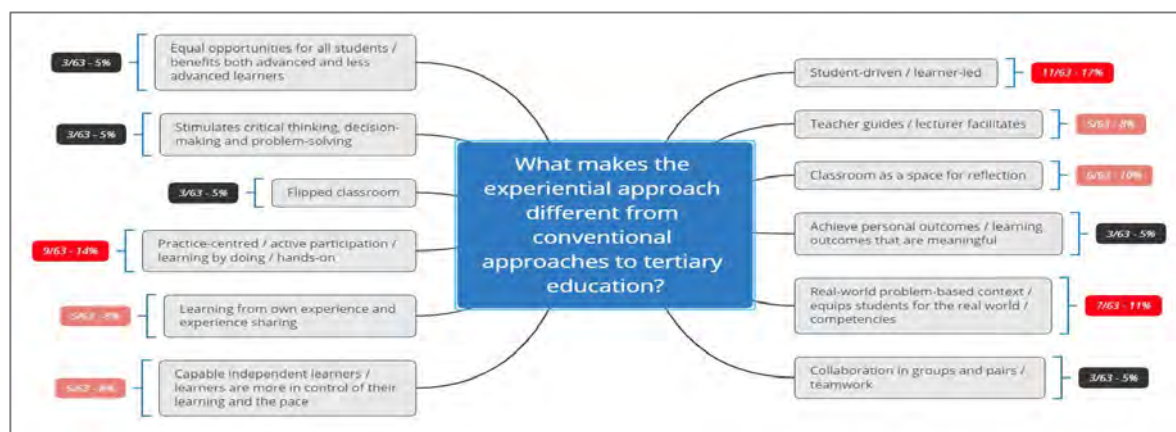


Figure 2: The key characteristics of experiential learning

A high number of responses (17%) stated that the experiential approach is more student-driven than conventional approaches to tertiary education. 14% stated that it is more practice-centred and relies on active participation.

A further 11% of responses showed that the experiential approach equips students more for the real world than a conventional approach, as it is always based on a real-world and problem-solving context. One participant said:

“Conventional tertiary teaching practice views students as empty containers or filing cabinets that need to be filled. It is teacher-driven didactic learning. Experiential learning views students as knowledge generators; as capable independent learners able to implement ideas and learning in a range of contexts. It is student-driven”.

Many responses (10%) also indicated that, with an experiential approach, the classroom is used as a space for reflection. 8% mentioned that the role of the teacher is that of a facilitator that only guides, while the learners are more in control of their learning and the pace of the lesson, thus allowing them to learn better from their own experience and through experience sharing. Another participant said:

“The teacher guides but the learner is more in control of the path their learning takes”.

The least popular responses (5%) were that an experiential approach encourages a flipped classroom model, collaboration in groups or teams, and that it helps students achieve both personal and learning outcomes that are meaningful. A few participants also mentioned that this approach represents equal opportunities for both advanced and less advanced learners, in that it stimulates critical thinking, decision-making and problem-solving in all students.

Question 3: How is experiential learning practiced? What types of activities initiate and reinforce experiential learning?

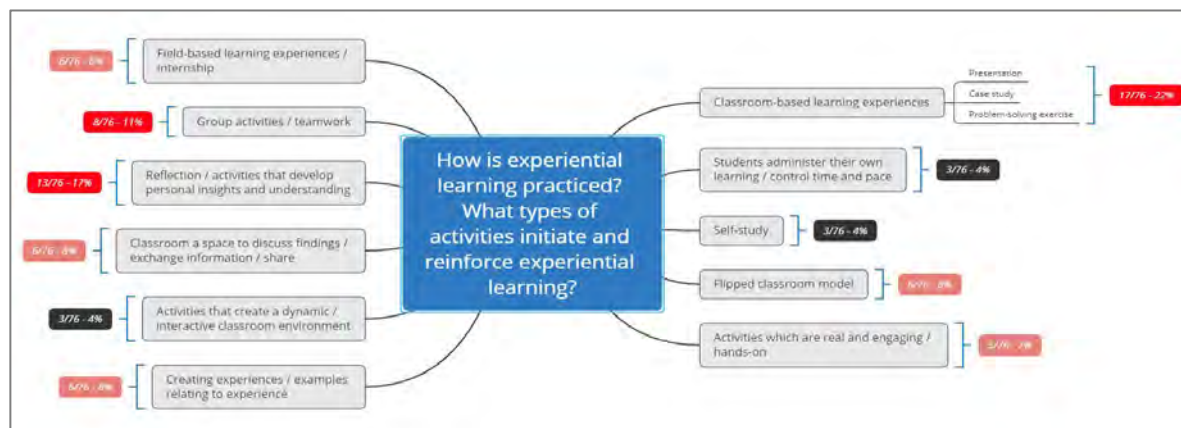


Figure 3: Applications of experiential learning

22% of the responses indicated that experiential learning is based on classroom-based learning experiences such as presentations, case studies and problem-solving exercises. A high number of participants also believed that it is based on group activities and teamwork (11%), as well as reflection or activities that develop personal insights and understanding (17%).

Many answers (8%) suggested field-based learning experiences or internships and a flipped classroom model as activities to encourage experiential learning. Another 8% described that the classroom should be used as a space to share information and discuss findings, and to create experiences. 7% encouraged hands-on class activities which are real and engaging. One participant said:

“This type of learning can be practiced in a number of ways, both in the classroom and in a real practical environment. With adult students this type of learning is very useful as they would have a great deal of experience that can be shared”.

Question 4: Can you name some types of experiential learning activities?

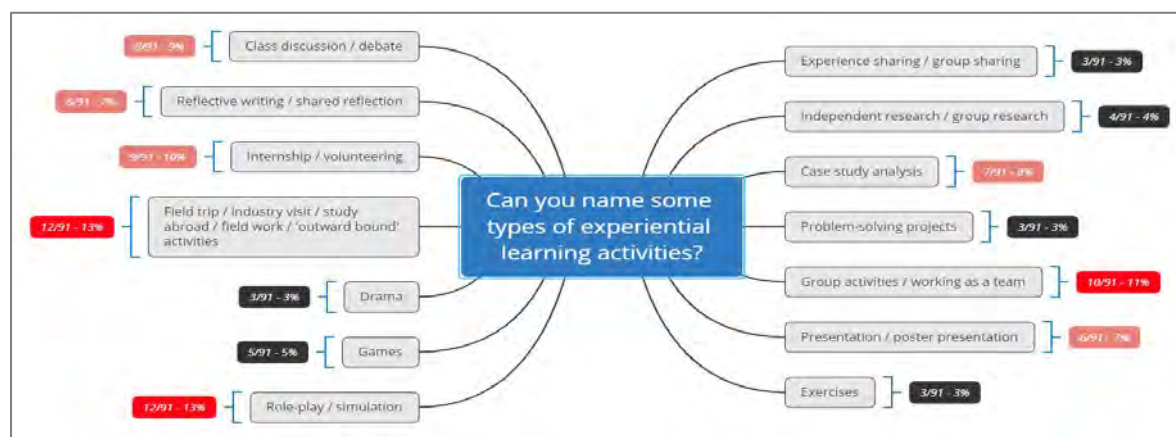


Figure 4: Experiential learning activities

Participants named outward bound activities such as fieldtrips (13%), role-plays or simulations (13%) and group activities (11%) as the most popular experiential learning activities. One participant said:

“Short case studies with a problem-solving element, so that learners are able to conceptualise, followed by a role-play like application in group work environment, create field-based activities, site visits, reflecting on common problems in the workplace and work in groups to solve the problems, then present the findings”.

Many answers suggested internships or volunteering (10%), class discussions or debates (9%), case study analyses (8%) and reflective writing and poster presentations (7%). A less popular activity mentioned was drama (5%), as a more elaborate form of role-play.

Question 5: What is the teacher’s role in experiential learning?

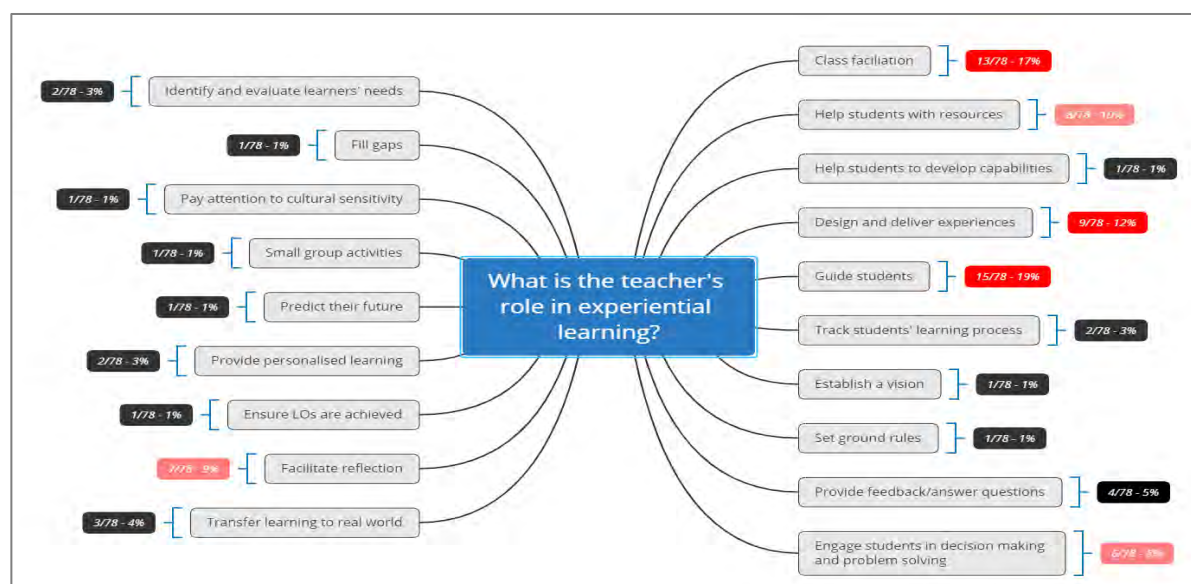


Figure 5: Teacher’s role in experiential learning

19% of the responses pointed out that the teacher is a guide who supports students in experiential learning activities. One participant gave an example:

“The teacher is a facilitator and will offer guidance. It will be important to set the scene with special attention to cultural sensitivities. I used an exercise called Chinese whispers, commonly used in schools and a fun exercise. The leader needs to have enthusiasm and motivation to make this type of learning happen, and the whispers did, it clearly shows how leaders should not communicate”.

Many responses (12%) showed that the teacher’s role in experiential learning is to design and deliver experiences. Some other responses (9%) highlighted the importance of reflection in experiential learning, and 8% suggested that engaging students in decision making and problem solving helped facilitate an experiential learning environment.

Lastly, 5% of the responses revealed that the teacher's role in experiential learning is to provide feedback and answer students' enquiries. The participants discussed that providing feedback and answering students' questions would enable them to experience critical thinking attributes.

Question 6: How is learning assessed in this approach?

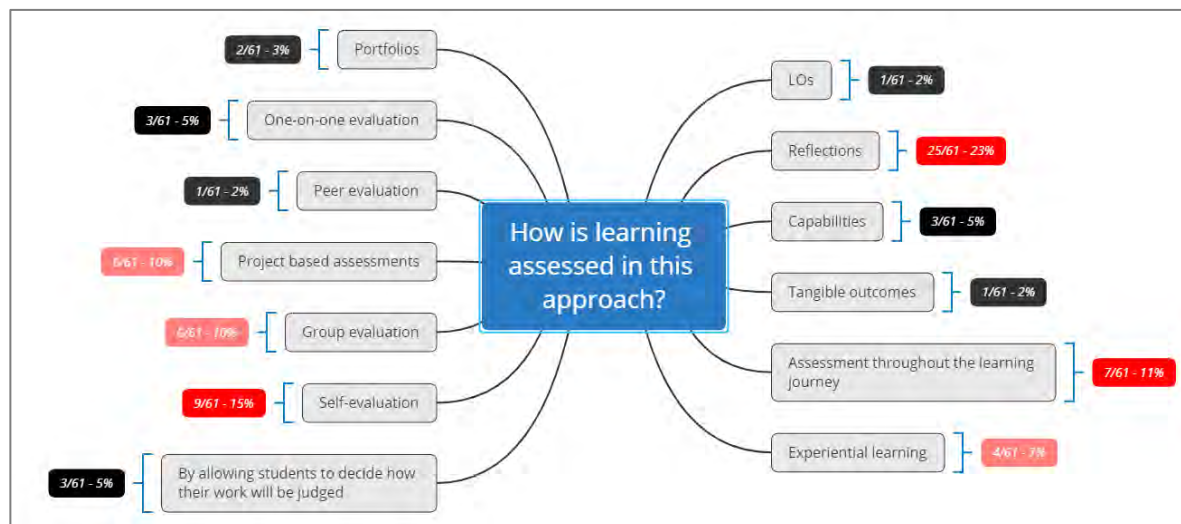


Figure 6: Assessment of experiential learning

The highest percentage of the responses (23%) showed that experiential learning can be assessed through reflection. It was found that the reflective assessments made it easier for learners to measure their progress over the learning period and evaluate their success. One participant said:

“The new learning and the growth in knowledge past the experiential learning activities through the self-reflection process shall be an integral part of the assessment. Towards the end of the experiential learning activity experience, the student should be able to describe/document how he will use the new learning in a new environment facing a similar situation”.

The second popular assessment method was through self-evaluation (15% of the responses received). Participants pointed out that self-evaluation-based assessment is a powerful way of measuring experiential learning at any stage:

“Learners benefit from the personal and flexible assessment opportunities received from self-evaluation”.

The responses showed that the assessment of experiential learning should be conducted throughout the learning journey (11% of the response rate). Measuring experiential learning through group work was chosen in 10% of the responses. Similarly, another 10% of the responses received showed that project-based assessment could also measure experiential learning. 7% of the responses revealed that experiential learning can be assessed within the experiential learning process itself.

5% of the answers showed that one-on-one evaluation, capability measurement systems and letting students choose their preferred assessment methods are important in assessing experiential learning outcomes.

Question 7: What is the place of reflection in learning?

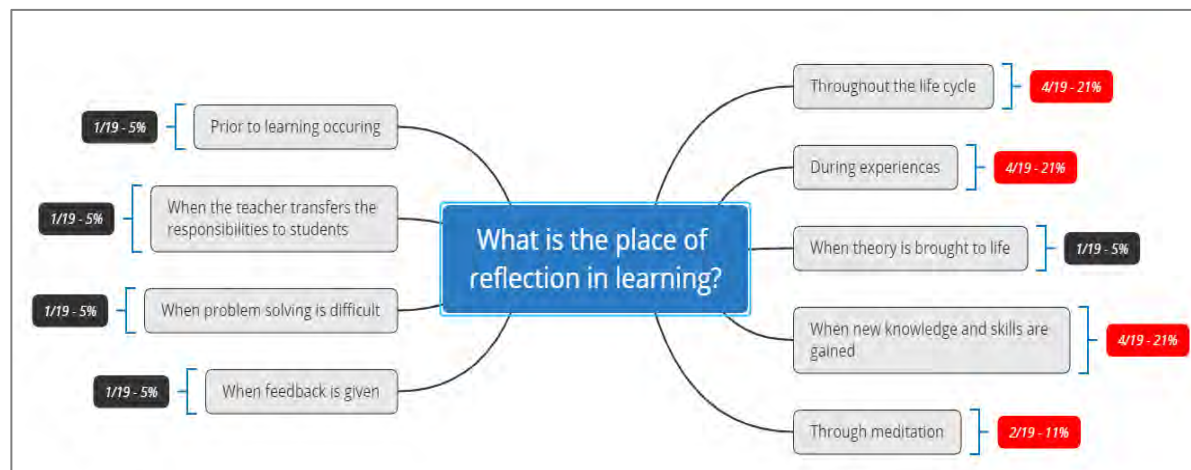


Figure 7: The importance of reflection in experiential learning

The highest percentage of the responses (21%) showed that reflection should be practiced during experiences. Participants said that the students and teachers should think about what they have done, reflect on what has been learnt or achieved and then modify their behaviour as a result. One participant said that reflection should be conscious and productive:

“Reflection will naturally occur from experience. The question is whether it is left to haphazard chance of the unconscious which may lead to unhelpful connections or not be at all effective, versus getting the reflective activities to occur at a more conscious level and be open to feedback to assist that process to build healthy productive reflective practices at the conscious level that builds a better quality learning cycle”.

Another 21% of the responses received revealed that when new knowledge and skills are gained, reflection should be part of the process. Participants said that the reflection process helps the learners to apply the learned principles to a new similar situation. The third answer with 21% popularity was that reflection should be practiced throughout the learning life cycle, joining the past and present learning and consequently preparing them for the future.

Some responses (11%) indicated that reflection is done through meditation as an active, conversive, dialectical exercise that requires as much intellectual work as does every other aspect of the learning process, from analysis to synthesis to evaluation.

Question 8: What are the ways in which reflection may be practised?

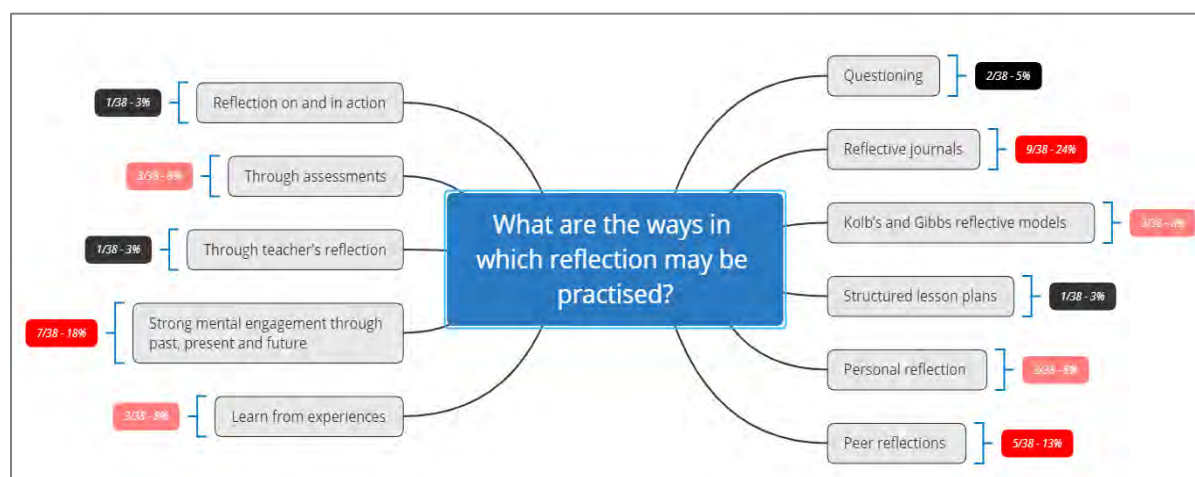


Figure 8: Examples of reflective practice in experiential learning

The most popular response (24%) was that reflection should be practiced through reflective journals with a focus on concepts, feelings, thought processes and the possible application of new learning. 18% of the responses said that reflection should be practiced via strong mental engagement throughout the past, present and future.

13% of the answers suggested that reflection be practiced through social and peer learning. Reflective activities such as personal reflections, reflective assessments, and learning from experiences were other popular responses (8%). A few responses (5%) revealed that reflection can be practiced through questioning.

Quantitative Data Analysis and Findings

The next step of the induction programme was the classroom observation process, where the experiential learning team had the opportunity to observe the new teaching staff in order to measure to what extent experiential learning activities were practised at our tertiary institution. Figure 9 represents the statistical analysis of the results from all the class observations. It shows that 27% of the class activities observed were teacher-centred and 73% of them were learner-centred. Giving feedback on learners' ideas (22%), engaging in practical experiential learning activity (11%), listening to student presentations/ideas (10%) and teacher responding to student questions (10%) were the four main learner-centred activities observed. Reflective practice represented 1% of the activities.

Observers generally remarked that classrooms were well-equipped and arranged to facilitate interaction. All students were reported to have the necessary materials for instruction. Goals for sessions were adequately communicated and learning was guided. Moreover, most of the class observations showed that teachers used real world examples and case studies, together with a wide variety of activities such as in-class team building exercises.

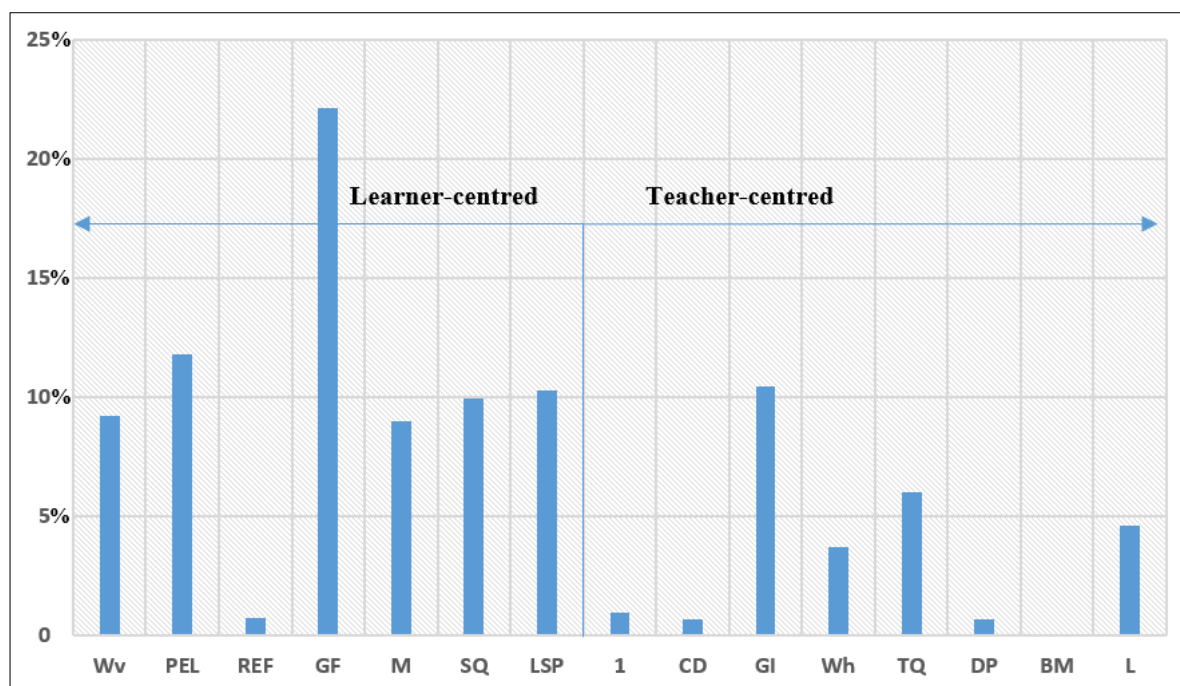


Figure 9: Statistic results of class observations

Teacher Centred		Learner Centred	
1	One on one teacher individual student	Wv	Watching a Video or watching student activity
CD	Class teaching demonstration	PEL	Engaged in practical experiential learning activity
GI	Giving Instructions	REF	Reflective practice - Learners making meaning
Wh	Whiteboard writing (student copying)	GF	Giving feedback on learners ideas
TQ	Teacher asking questions	M	Moving around the learning setting
DP	Data Projector ppt teacher presentation	SQ	Teacher responding to student questions
BM	Behaviour Management	LSP	Listening to student presentations/ideas
L	Tutor lecturing		

Figure 10: Legend of teacher-centred and learner-centred activities on the observation tool

Discussion

This study intended to share the findings of a trial staff induction programme designed to promote experiential learning and reflective practice. Based on literature, which promotes experiential learning and reflective practice, the role of the staff induction was very important for us to be able to implement these learning and teaching methods in the curriculum of our institution. Throughout the induction programme, our staff showed a high interest in exploring experiential learning and reflective practice.

The results of the online induction course showed that staff were aware of learning through experiences and reflective practice. Overall, the findings supported the experiential learning theories provided by Boydell (1976), Chickering (1977), Saddington (1992), Cantor (1997), Jarvis (1999), and Beard and Wilson (2002). The findings specifically showed that employing experiential learning and reflective practice brings an authentic learner-centred environment

into the classroom (Beard & Wilson, 2015; Moon, 2004). Therefore, our results support the value of academic staff induction programmes in order to promote student-centred teaching practice, allowing students to play an active role in their learning to successfully achieve higher learning outcomes (Yuen & Hau, 2006).

The responses indicated that, in experiential learning, the teacher's main role is to guide and support students. Moreover, they reported that the teacher also plays a central role in engaging students in decision making, problem solving and providing feedback and answers to students' enquiries, so that students would eventually develop their own values, attitudes, knowledge and skills throughout their learning cycle (Byram & Dube, 2008). The participants noted that, in order to successfully guide and facilitate these activities, the teacher needs to develop the required experience to deliver these types of classes. Overall, the results of this study reinforce that staff induction programmes play a key role in supporting teachers to adopt a more learner-centred role, which promotes student engagement.

The participants reported that experiential learning means a hands-on approach in which students learn by doing and reflecting. It can continue throughout the life cycle of the learning journey, which is aligned with Kolb's experiential learning cycle. The participants' experience also supported Chadha and Nicholls (2006) statement that experiential learning activities make students more responsible for their learning while enhancing their capabilities and transferable skills. Their responses supported that the key characteristics of experiential learning include: a student-driven nature, a practice-centred approach, active student engagement, as well as problem solving and reflective tasks that are connected to the real world. Among experiential learning activities suggested by the participants in the questionnaires, field trips, role-plays, simulations, group activities, volunteering/internships, class discussions/debates, reflective writing and presentations were dominant.

Based on their responses in the online questionnaire, the participants believed that experiential learning is mainly assessed through reflection. They believed that as part of reflective assessment, self-reflection should be considered an integral part of the assessment process throughout the learning journey. The participants also thought that another effective way of measuring learning through experience is group work, as it promotes inclusiveness, teamwork, leadership and communication. The study showed that it is important to embed reflection as an assessment method for evaluating the experiential learning process. It provides opportunities for self-assessment and lifelong learning (Bond, Evans, & Ellis, 2011).

The results of the class observations confirm the participants' understanding of the importance of learner-centred classroom activities, such as giving feedback on learners' ideas, engaging in practical experiential learning activities, listening to students' presentations/ideas and responding to learners' questions. The findings reinforced what staff already knew about experiential learning and reflection and showed that they managed to use experiential learning in their classes. However, the class observation data analysis showed that only a small number of reflection activities were used during classes and that many teachers were not familiar with reflection and its implementation with the students. Even though experiential learning activities filled 11% of observed class time, reflective practice occupied a mere 1%. It became apparent that, although theoretical awareness about experiential learning was not a problem for new academic staff, the practical application of this was not always fully achieved. This was probably due to the fact that most teaching practitioners saw experiential learning simply as isolated class activities, exercises from which students can learn. A deeper approach to experiential learning, one that shows that an experiential learning activity is only complete

when it is accompanied by a short reflective task, was not fully understood. This research supported the idea that further professional development workshops might need to be conducted at this institution, to discuss how experiences can be reflected upon, in order to enable every teacher to use reflection appropriately.

Overall, in contemporary educational practice, academic staff induction programmes can help create better staff relationships through pre-observation meetings, class observations and post-observation meetings. Making teachers aware of the collected data on their performance helps to inform staff future goals and professional development needs. Teacher performance data could also help educational providers report on the overall learning and teaching performance. It provides clear information on what teachers actually do in the classroom and how that aligns with organisational values, goals, student needs and funding requirements. This should hopefully lead to better quality teaching and produce better quality graduates.

Conclusion

The aim of this particular induction programme was to encourage more teaching staff to use an experiential learning classroom environment, as part of the institution's general teaching policy. As highlighted in the literature review, experiential learning and reflective practice are both relevant for current education theories and research, so we conducted this study in order to help the institution to change its learning and teaching methods from the old teacher-centred way to a more experiential approach. The research revealed that staff induction is a successful process that generates mutually beneficial critical conversations between educational professionals.

In theory, academic staff understood what experiential learning is and its overall importance in tertiary education, compared with other more conventional learning approaches. During our discussions, the staff proved to be very familiar with different types of learner-centred experiential learning activities and seemed keen to trial them in their own classes. Most participants in the questionnaire suggested that reflection plays a major role in experiential learning and that this is one of the main ways in which we can assess experiential learning. They also came up with a variety of useful reflective tasks that can be practiced in class.

In practice, following the class observations, we were able to confirm our initial findings that teaching staff were very creative in using experiential learning activities in their classes and making sure that students are having a fun time, trialling a wide variety of practical exercises. However, even though most of the teaching staff knew the theory behind experiential learning (or have found out and consolidated this theory during the short Moodle course and questionnaire), not everyone understood how to achieve real learning through an experiential learning type of lesson.

Overall, this process has proven to be very beneficial for both new staff and the experiential learning team, as this is a great opportunity for everyone to share interesting and original ideas about experiential learning, learn from each other and reflect more on their practice. Based on these findings, we concluded that a better-organised staff induction programme at our institution is key to further increase the quality of learning and teaching.

Limitations of this Study

We acknowledge the limitations of this study. Firstly, the results of the study might appear to not reflect the general situation at our institution, as the number of participants was limited to 16 (due to only having 16 new staff who went through the induction process during the study period). However, the sample was found to be representative for the size of our institution. Secondly, the class observations conducted were all scheduled, giving staff the opportunity to plan their lessons in advance. Therefore, the classroom behaviour observed may not have represented their usual teaching habits. Thirdly, the results of the observations could have been further affected by the stress of being observed, as well as the time limitation of 30 minutes per observation.

Recommendations

The paper aims to highlight the need for creating a cultural shift with improved learning styles, implementing experiential learning and reflective practice among staff and students in the tertiary education sector. The new interesting ideas generated on experiential learning and reflective practice during the research are certainly good resources to apply and practice in the classroom, although this is just the beginning of the process. A more sustained and constructive approach from all the parties involved should be beneficial for better results in the future (institution, academic staff and students).

The willingness of the institution to promote and support this programme is necessary. Implementing experiential learning and reflection practice into the usual staff induction process, to include education and training on the importance of these teaching strategies, would definitely be beneficial. Introducing these strategies into the existing curriculum would require extra work on curriculum design, as well as a specific implementation and a guided assessment process.

Training sessions should be provided to both staff and students on adjusting the traditional teaching and learning methods by introducing more experiences and reflection. The results show that staff might benefit from more training in terms of reflective activities they can employ during an experiential learning lesson, to make sure that this is indeed a meaningful learning experience. Therefore, support services should be in place to guide, support and evaluate the progress for both staff and students. These services should be able to guide and help students to continue learning through experiences and to continuously reflect in their self-directed learning journey.

References

- Ahmed, E., Nordin, Z. S., Shah, S. R., & Channa, M. A. (2018). Peer observation: A professional learning tool for English language teachers in an EFL institute. *World Journal of Education, 8*(2), 73–87. <https://doi.org/10.5430/wje.v8n2p73>
- Bear, G. G., & Minke, K. M. (eds.). (2006). *Children's needs III: Development, prevention, and intervention*. Washington, DC: National Association of School Psychologists.
- Beard, C., & Wilson, J. P. (2002). *Experiential learning*. London: Kogan Page.
- Beard, C., & Wilson, J. P. (2015). *Experiential learning: A handbook for education, training and coaching*. (3rd ed.). London: Kogan Page.
- Bond, J. B., Evans, L., & Ellis, A. K. (2011). Reflective assessment. *Principal Leadership, 11*(6), 32–34.
- Boud, D. (1994). Conceptualising learning from experience: Developing a model for facilitation. *Proceedings of the 35th Adult Education Research Conference*, 49–54.
- Boud, D. (2010). Sustainable assessment: Rethinking assessment for the learning society. *Studies in Continuing Education, 22*(2), 151–167. <https://doi.org/10.1080/713695728>
- Boydell, T. (1976) *Experiential learning*, Manchester Monograph 5, University of Manchester, Department of Adult Education.
- Brookfield, S. D. (1995). *Becoming a critically reflective teacher*. San Francisco: Jossey Bass.
- Brookfield, S. D. (2017). *Becoming a critically reflective teacher* (2nd ed.). CA: Jossey-Bass Inc.
- Bryman, A. (2016). *Social research methods* (5th ed.). Oxford NY: Oxford University Press.
- Byram, R., & Dube, H. (2008). *Planning for Success*. NY: Continuum International Publishing Group.
- Cantor, J. A. (1997). *Experiential learning in higher education: Linking classroom and community*. The George Washington University, Graduate School of Education and Human Development, Washington DC
- Cavilla, D. (2017). The effects of student reflection on academic performance and motivation. *SAGE Open, 7*(3). <https://doi.org/10.1177/2158244017733790>
- Chadha, D., & Nicholls, G. (2006). Teaching transferable skills to undergraduate engineering students: Recognising the value of embedded and bolt-on approaches. *International Journal of Engineering Education, 22*(1), 116–122.
- Chickering, A. W. (1977) *Experience and learning: An introduction to experiential learning*. Change Magazine Press, New Rochelle, NY
- Dewey, J. (1938). *Experience and education*. NY: Collier.
- Felicia, P. (2011). *Handbook of research on improving learning and motivation through educational games: Multidisciplinary approaches*. Hershey, Pennsylvania: IGI Global.
- Gardner, H. (1999). *Intelligence reframed: Multiple intelligences for the 21st century*. New York: Basic Books.

- Jarvis, P. (1999) *International dictionary of adult and continuing education*. Kogan Page, London.
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. New Jersey: Prentice Hall.
- Kolb, D. A. (2015). *Experiential learning: Experience as the source of learning and development*. New Jersey: Pearson Education (US).
- Lewis, L. H., & Williams, C. J. (1994). Experiential learning: Past and present. *New Directions for Adult and Continuing Education*, 62, 5–6. <https://doi.org/10.1002/ace.36719946203>
- Miller, R. J., & Maellaro, R. (2016). Getting to the root of the problem in experiential learning: Using problem solving and collective reflection to improve learning outcomes. *Journal of Management Education*, 40(2), 170–193. <https://doi.org/10.1177/1052562915623822>
- Moon, J. A. (2004). *A handbook of reflective and experiential learning: Theory and practice*. Oxon: Routledge Falmer.
- Morgan, D. L. (2007). Paradigms lost and pragmatism regained: Methodological implications of combining qualitative and quantitative methods. *Journal of Mixed Methods Research*, 1(1), 48–76. <https://doi.org/10.1177/2345678906292462>
- Murphy Tighe, S., & Bradshaw, C. (2013). Peer-supported review of teaching: Making the grade in midwifery and nursing education. *Nurse Education Today*, 33(11), 1347–1351. <https://doi.org/10.1016/j.nedt.2012.07.016>
- Pedler, M. (2011). *Action learning in practice*. Surrey, England: Gower Publishing Limited.
- Rashidi, N., & Moghadam, M. (2014). The effect of teachers' beliefs and sense of self-efficacy on Iranian EFL learners' satisfaction and academic achievement. *e Electronic Journal for English as a Second Language*, 18(2).
- Saddington (1992). Learner experience: A rich resource for learning. In J. Mulligan, & C. Griffin (eds.), *Empowerment through experiential learning: Explorations of good practice*, 37–39. Kogan Page, London.
- Schon, D. A. (2017). *The reflective practitioner*. NY: Basic Books Inc.
- Schonell, S., Gilchrist, J., Kennelly, R., McCormack, C., Northcote, M., Ruge, G., & Treloar, G. (2016). *TATAL talking about teaching and learning: Teaching philosophy workbook*. Hammondville, Australia: Higher Education Research and Development Society of Australasia.
- Stephenson, J. (1998). The concept of capability and its importance in higher education. *Capability and Quality in Higher Education*, 1–13. London: Kogan Page.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. London: Harvard University Press.
- Yuen, K. M., & Hau, K. T. (2006). Constructivist teaching and teacher-centred teaching: A comparison of students' learning in a university course. *Innovations in Education and Teaching International*, 43(3), 279–290. <https://doi.org/10.1080/14703290600750861>

Corresponding author: Vera Maria Nistor

Contact email: vera.nistor@op.ac.nz

Independence and Interdependence of a Professional Development School Partnership

Robert F. Sumowski
Georgia College & State University, USA

Joseph M. Peters
Georgia College & State University, USA

Abstract

Professional Development School Partnerships have the potential to provide unique experiences for teacher candidates and also provide important professional development for the K-12 school personnel involved in the relationship. According to the National Association of Professional Development Schools (2008), a key essential to a successful partnership involves the entities' ability to achieve objectives together that neither partner might be able to fully accomplish individually. Our Professional Development School is a model for how the partners' joint mission operates beyond each institution's ability to provide the experiences and services in isolation. Although both the school district and the university are independent entities, their interdependence in the Professional Development School allows us to accomplish the overarching mission to improve education at all levels in our community from six weeks old to the doctoral level. The benefits are initiatives such as a joint Montessori Academy for children, participation on advisory councils, and a grade seven through twelve Early College program. Classrooms are made available for university faculty to do research, preservice teacher candidates can observe and practice, and first-generation at-risk students have the support they need for college placement. Professional development offerings by university faculty and District staff in areas such as Positive Behavior Interventions and Supports allow District teachers a unique professional development experience and the ability to continue and achieve a university certificate for their participation.

Keywords: professional development school, positive behavior interventions and supports, independence, interdependence

Over 30 years ago, the Holmes Group introduced the concept of Professional Development School (PDS) relationships as “working partnerships among university faculty, practicing teachers, and administrators that are designed around the systematic improvement of practice” (1986, pp. 66-67). They likened them to teaching hospitals, where research and practice exchanges occur that benefit both entities. Since that time, PDS relationships have grown from a “concept to a vibrant and important reality;” “a cornerstone of serious attempts to simultaneously improve teacher education and public schools” (Teitel, 2004, p. 1). Today the National Association for Professional Development Schools (n.d.; 2019) supports an annual conference and the *School-University Partnerships* journal. In this publication, the authors highlight the importance of the interdependence of the relationship while still maintaining University and District independence. Various examples, such as instituting a Positive Behavior Interventions and Supports (PBIS) program, a Montessori Academy, an Early College Program for middle and high school students, and multiple joint grants, illustrate examples of the independent and interdependent relationship.

The purpose of the present study was to examine the various aspects of the PDS partnership between a University and its neighboring PreK-12 school district in light of its independent and interdependent relationship utilizing a mixed methods design. The study is relevant to those studying or planning to implement similar partnerships in that it illustrates successes and challenges within the PDS model. Following a review of relevant literature, the researchers present an outline of the methodology that guided the study, results, and a discussion of the, the study’s limitations, and suggestions for further research. Four categories, including (1) adhering to essentials guiding the partnership, (2) reading and mathematics literacy support, (3) developing and supporting joint programs, and (4) positive behavior interventions and supports are explored as they relate to the independent and interdependent relationship and student and district success.

Establishing the Relationship

The PDS partnership was developed in 2015 between a state university and a county-wide charter school district in central Georgia. It was shortly after the District’s superintendent and the College of Education’s dean were hired. Both had previous experiences with PDS partnerships in other settings. After initial exploratory discussions and guidance from external PDS consultants, the University and District developed a memorandum of understanding (MOU) and assigned a liaison from each entity to coordinate monthly PDS meetings to guide and coordinate the partnership’s many activities. The liaison role was seen as essential to the partnership (Parker, Parsons, Groth, & Brown, 2016).

Because literacy was an initial priority, a literacy faculty member represented the College of Education (COE), spending a day each week in the District. As the partnership progressed, a second faculty member with PBIS experience was also assigned to the District. In addition to the monthly PDS meetings, the COE Dean, Georgia College & State University (GCSU) President and Provost, and the District Superintendent met on an annual basis to review the partnership and look at potential opportunities that fit within the guiding essentials of a PDS relationship.

Literature Review

Professional Development Schools originated with the goal of creating school-university partnerships for educational change through enhanced professional development (Darling-Hammond, 1994, 1998; Goodlad, 1990; Holmes Group, 1986, 1990; Levine, 1992, 1998).

Professional development is enhanced when there is a supporting environment (Chang, Chen, & Chou, 2017; Tracz, Beare, & Torgerson, 2018). These partnerships are designed to promote professional development of both the novice and veteran teacher (Carpenter & Sherretz, 2012; Darling-Hammond, 1994; Ismat, 1999; Nzarirwehi & Atuhumuze, 2019). The latter is often overlooked however, and there can often be a lack of parity (Al Seyabil, 2017; Breault, 2014). Oftentimes the impetus for the relationship is that colleges need places to place preservice teachers (Walsh & Backe, 2013). One goal of our partnership and supporting research was to challenge the notion that these relationships are limited to just professional development and a place to assign preservice teachers.

As the American Association of Colleges for Teacher Education (AACTE) points out “[a]nother important teaching function of colleges of education is providing continuing professional education for teachers, school administrators, and other education professionals” (2018a, p. 37). Darling-Hammond (1998) emphasizes the duality of the relationship by stressing that a professional teacher continues to learn from teaching.

These new programs typically engage prospective teachers in studying research and conducting their own inquiries through cases, action research, and structured reflections about practice. They envision the professional teacher as one who learns from teaching rather than as one who has finished learning how to teach, and the job of teacher education as developing the capacity to inquire systematically and sensitively into the nature of learning and the effects of teaching (Darling-Hammond, 1998, p. 9).

PDS provides a role for teacher educators to assist both novices and experts with the important end goal of promoting student achievement, an often-overlooked area of the partnership (Abdal-Haqq, 1999; Darling-Hammond, 1998; Darling-Hammond, Ramos-Beban, Altamirano, & Hylar, 1998; Murrell, 1998, Renyi, 1996). According to the National Association for Professional Development Schools (NAPDS) vision, there needs to be “equal representation of, and access for, all educators invested in improving education” (2008a). One primary goal of our partnership and supporting research was to challenge the notion that these relationships are limited and simply facilitate things that occur without a PDS relationship.

Professional development work in the schools also promotes Boyer’s concept of the scholarship of engagement as faculty share their expertise in the schools (Andrews & Leonard, 2018; Boyer, 1996). This can be challenging at times since successful partnerships involve collaborative relationships that support school-wide approaches with every teacher involved (Colwell, MacIsaac, Tichenor, Heins, & Piechura, 2014; Parsons & Renyi, 1999). Additionally, there can also be challenges to the role the teacher educator plays in the school, how the hierarchy is established, and when there are organizational changes (Ronen, 2018; Schack, 2011). One area for our partnership was classroom management through positive behavioral approaches.

Early College Program

In Georgia, Early College is a partnership between the Georgia Department of Education and the University System of Georgia. Public schools partner with public colleges and universities to offer high school courses and dual enrollment opportunities. According to the Board of Regents of the University System of Georgia (2017, para. 2), “[e]arly College is an intervention strategy for students who may not be well served by traditional high schools. The initiative also

seeks to change the face of higher education by targeting those students traditionally underrepresented on college campuses.”

Montessori Academy

Montessori education was developed by Maria Montessori, an Italian physician. It dates back more than 100 years. It is characterized by “children working independently and in groups, often with specially designed learning materials; deeply engaged in their work; and respectful of themselves and their surroundings” (American Montessori Society, n. d., para. 2). Another distinguishing feature is that “children are provided freedom to explore subjects in blended classrooms where older students solidify their own knowledge by helping the younger students learn” (Montessori Academy at the Early Learning Center, n. d., para. 1).

Positive Behavioral Interventions and Supports

School-wide Positive Behavioral Interventions and Supports (SW-PBIS) is “a systems approach to establishing the social culture and behavioral supports needed for all children in a school to achieve both social and academic success” (Horner, Sugai, & Lewis, 2015, p. 1). SW-PBIS initially involves a leadership team where behavior specialists, administrators, regular teachers, and special needs teachers attend training sessions on PBIS, establish schoolwide goals, and begin an implementation plan (Netzel & Eber, 2003). This is followed by school-wide implementation, where the team provides ongoing professional development for the building staff, analyzes the behavioral policies already in place, adjusts as needed, and begins documenting outcomes with a research-based approach (Cressey, Whitcomb, McGilvray-Rivet, Morrison, & Shander-Reynolds, 2018; Hirsch et al., 2019; Horner et al., 2014; Horner, Sugai, & Lewis, 2015; Netzel & Eber, 2003; Sugai & Horner, 2009). The core elements of PBIS are shown in Table 1.

Table 1: Core elements at each of the three tiers in the PBIS prevention model

Prevention Tier	Core Elements
Primary	Behavioral Expectations Defined Behavioral Expectations Taught Reward system for appropriate behavior Clearly defined consequences for problem behavior Differentiated instruction for behavior Continuous collection and use of data for decision-making Universal screening for behavior support
Secondary	Progress monitoring for at risk students System for increasing structure and predictability System for increasing contingent adult feedback System for linking academic and behavioral performance System for increasing home/school communication Collection and use of data for decision-making Basic-level function-based support
Tertiary	Functional Behavioral Assessment (full, complex) Team-based comprehensive assessment Linking of academic and behavior supports Individualized intervention based on assessment information focusing on (a) prevention of problem contexts, (b) instruction on functionally equivalent skills, and instruction on desired performance skills, (c) strategies for placing problem behavior on extinction, (d) strategies for enhancing contingency reward of desired behavior, and (e) use of negative or safety consequences if needed. Collection and use of data for decision-making
Reference: Horner, Sugai, & Lewis, 2015, p. 2	

The National Association of Professional Development Schools Essentials

The National Association of Professional Development Schools (NAPDS) provided a policy statement titled “What It Means to Be a Professional Development School,” at its annual meeting April 12, 2008 (2008b). This statement, based on the work from a summit the prior year, delineated what it meant to have a PDS relationship by providing guidelines that were shown as the “nine essentials” (2008a). The purpose of this document was to specifically delineate what a professional development school relationship was and eliminate the “catch-all” models that were not true PDS relationships. In the document, they provided the nine required essentials of a PDS as:

1. A comprehensive mission that is broader in its outreach and scope than the mission of any partner and that furthers the education profession and its responsibility to advance equity within schools and, by potential extension, the broader community;
 2. A school–university culture committed to the preparation of future educators that embraces their active engagement in the school community;
 3. Ongoing and reciprocal professional development for all participants guided by need;
 4. A shared commitment to innovative and reflective practice by all participants;
 5. Engagement in and public sharing of the results of deliberate investigations of practice by respective participants;
 6. An articulation agreement developed by the respective participants delineating the roles and responsibilities of all involved;
 7. A structure that allows all participants a forum for ongoing governance, reflection, and collaboration;
 8. Work by college/university faculty and P–12 faculty in formal roles across institutional settings; and
 9. Dedicated and shared resources and formal rewards and recognition structures.
- (2008b, pp. 2-3).

These essentials are all important to the proper functioning of a PDS relationship.

Evaluating the Success of a Professional Development School

When referring to the evaluation of the long-term professional development school relationship at the University of North Carolina at Wilmington and its partners, the authors note the lack of empirical studies on PDS models (Lewis & Walser, 2016). Bentley and Hendricks (2018) qualitatively discuss their collaborative experiences in promoting literacy, but do not provide the overall partnership specifics. Polly, Reinke, and Putnam (2019) explore their partnership in light of Goodlad’s postulates (Goodlad, 1994) and the AACTE clinical practice report (American Association of Colleges for Teacher Education [AACTE], 2018b). They address the nine essentials, but the article is essentially a synthesis of the NAPDS, AACTE, and Goodlad’s postulates.

Many studies discuss the PDS partnership from a university perspective, but often only focus on the field experiences for preservice teachers. Darling-Hammond (2010) cites positive experiences for teachers, but as M. Caparo, R. Caparo, and Helfeldt report, studies are “equivocal as the learning that occurs during field experiences” (2010, p. 132). This is due to the contextualization of programs involving specific partners. Darling-Hammond & Bransford (2005) have documented gains in student performance resulting from PDS initiatives (see pages 415–416). This study looks at the PDS relationship, support for the nine essentials, and the outcomes of a strong PDS.

Methodology and Methods

Participants

The partnership is with a county charter school system in rural Georgia. It is a Title I school district with four elementary schools, one middle school, and one high school. The student population is representative of the county's population. Over 80% of the students qualify for free or reduced-price meals and there is an approximate enrollment of 5,500 students. The racial makeup is 65% black, 28% white, 1% Asian, 2% Hispanic, and 4% multi-racial.

Research Design

Because of the various components of the PDS relationship, a mixed methods approach was used to study the various outcomes of the partnership. A variation of the explanatory design was used because the quantitative and qualitative data was collected in separate phases and later used to support the research questions (Creswell & Plano Clark, 2006). Johnson, Onwuegbuzie, and Turner (2007) describe mixed methods research as follows:

Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e. g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration (p. 123).

Table 2 shows the four main areas we used to examine the PDS partnership and why they were incorporated into the design.

Table 2: Areas of support

Four areas used to study the partnership and why they were chosen			
1. Adhering to essentials guiding the partnership	2. Reading and mathematics literacy support	3. Developing and supporting joint programs	4. Positive Behavior Interventions and Supports
Because this was an emerging partnership, both groups wanted to have a highly successful professional development school relationship, and because both entities had PDS relationships with other institutions with various levels of success, it was important to adhere to the to nine essentials as outlined by the National Association for Professional Development Schools. Since this would be difficult to explore in a quantitative way, a qualitative approach was taken.	One of the first partner activities was to provide literacy support. This is a key evaluative area for schools in Georgia (The College and Career Readiness Performance Index that ranks schools and includes literacy data as measured by the Georgia Milestones statewide exam). It is also an area that was initially determined as needing support. Positive results in this area would show that the PDS relationship was benefiting the schools and participating preservice teachers.	Two major ongoing programs are the Early College where grades 7-12 students attend regular and college classes on the university campus and a Montessori Academy for birth-kindergarten children of parents from the district and university have childcare in the district's early learning center. We were especially interested in looking at how the partnership would help facilitate problem solving when there were problems at either partnership site.	PBIS was the second major area of partner support after the literacy support. This area provided the ability for the district to become a "PBIS district" with the Georgia Department of Education, having a special education professor familiar with PBIS on site to provide professional development and also involve the special education preservice teachers was a win for both partners and a reason to look at if there was success in that area of the PDS partnership.

Table 3 illustrates the components of the design with the research methodology and questions.

Table 3: Research questions and methodology

Research Question	Research Method	Design References
Did the University and the District adhere to nine essentials as outlined by the National Association for Professional Development Schools?	Qualitative evaluation research (Denzin & Lincoln, 2011; Newman, 2011) conducted by internal evaluators looking at the nine required essentials by the National Association for Professional Development Schools (National Association for Professional Development Schools [NAPDS], 2008b) in comparison to the outcomes of the partnership. Interviews were the primary source of data when comparing the standards to the practices.	“The systematic identification and assessment of effects generated by treatments, programmes, policies, practices, and products.” (Jupp, 2009, p. 104). “At the most elemental level, evaluation research is aimed at determining whether a program was actually carried out. At a more complex level, research is concerned with the effectiveness and/or the economic attributes of a program. Ideally such information should contribute to decisions about whether to expand, curtail, or modify a program.” (Gordon & Morse, 1975, p. 339)
Will there be overall gains in elementary school student achievement (e.g. literacy, math, and science) as measured by the school’s state grade on the College and Career Ready Performance Index (CCRPI) that includes the Georgia Milestones end-of-grade assessment in reading and mathematics?	Comparing 2014 baseline College and Career Readiness Performance Index (CCRPI) scores to 2017 scores with a correlated two-tail t-test (Lowry, 2019).	“The t-test for correlated samples is especially useful in research involving human or animal subjects precisely because it is so very effective in removing the extraneous effects of pre-existing individual differences” (Lowry, 2019).
Will joint projects be mutually beneficial to both partner organizations?	Qualitative evaluation research (Denzin & Lincoln, 2011; Newman, 2011) conducted by internal evaluators looking at the outcomes of the partnership through interview data and discussions.	The conclusions can lead to “a new design and development model” or “an enhanced version of an existing design and development model” (Richey & Klein, 2007, p. 136). Supporting data includes “user perceptions and reports.”
Will the Positive Behavior Interventions and Supports program lead to a significant reduction in discipline incidents reported to the state?	Comparing 2014 (baseline Office Disciplinary Referrals (ODR) scores to 2016 scores with a correlated two-tailed t-test (Lowry, 2019).	

Ethical Approval

Institutional Review Board approval was provided to study the Professional Development School relationship with the district. In this study, only top-level, public data were used so that individual teachers or students could not be identified.

Results and Discussion

The findings can be grouped into four categories that reflect the research questions. These include (1) adhering to essentials guiding the partnership, (2) reading and mathematics literacy support, (3) developing and supporting joint programs, and (4) positive behavior interventions and supports. The narrative also provides information on what occurred as part of the partnership.

Category 1: Adhering to Essentials Guiding the Partnership

Our PDS partnership is guided by the nine required essentials developed by the Executive Council and Board of Directors of the National Association for Professional Development Schools (NAPDS, 2008b). All members of the partnership agreed to this claim.

Essential 1. The first essential is “[a] comprehensive mission that is broader in its outreach and scope than the mission of any partner and that furthers the education profession and its responsibility to advance equity within schools and, by potential extension, the broader community” (NAPDS, n.d., para 4). Both parties agreed that it was important to the region to improve the education of PreK-12 students. Few local students were competitive in gaining admission to GCSU, given that it is a selective institution in the state system (GCSU, 2016). As the president of the university pointed out in a meeting, “[w]e need to work collaboratively if we are going to change the educational situation in our community” (S. Dorman, personal communication, August 8, 2018). At that time a goal was set to seek funding to establish a center for rural education to assist middle Georgia rural communities in advancing education, especially with economically-challenged communities.

The formal PDS memorandum of understanding between the District and University reflects the comprehensive mission essential and starts out with the following:

Professional Development Schools (PDSs) represent a partnership among schools, universities, and community stakeholders. The Baldwin County School District and Georgia College are committed to becoming a driving force in the community by transforming P-20 education and developing students, educators, and leaders who think critically and design innovative and creative opportunities within a democratic and global society. The mission of the professional development school partnership between BCSD and GCSU is to improve P-20 education for our students, educators, and leaders through collaborative engagement in teaching and learning (Georgia College & State University & The Baldwin County School District, 2015, p. 1).

Essential 2. The second essential is “a school – university culture committed to the preparation of future educators that embraces their active engagement in the school community” (NAPDS, n.d., para 4). The College of Education has a long history of having a strong teacher preparation program. Preservice teachers spend 2-3 days a week in the field as juniors and complete a year-long internship as seniors. The District is a primary place for placing students for active engagement in the classroom (C. Garrett, personal communication, July 30, 2019). Currently, the middle grades program preservice teachers are all placed in the district’s middle school.

Likewise, the special education program is holding class in the district and those students are working in the schools. The early childhood/elementary and secondary programs are also placed in the district whenever possible.

Essential 3. The third essential is an “ongoing and reciprocal professional development for all participants guided by need” (NAPDS, n.d., para 4). Due to the high poverty level of the community, all schools in the District are Title I. In 2015, three of the four elementary schools were considered “Focus Schools” by the State of Georgia due to not reaching minimum achievement levels (Baldwin County School System, 2015). This put literacy professional development for the District teachers as a high priority. It also offered additional professional development opportunities for the preservice teachers assigned to the schools. We continue to support this effort and the scores on the state of Georgia Milestones exam reflect that the effort is working.

Essential 4. The professional development opportunities also met the fourth essential of a “shared commitment to innovative and reflective practice by all participants” (NAPDS, n.d., para 4). This was seen as classroom teachers tried new methods to engage students and provide positive behavioral supports. Likewise, preservice teachers gained valuable insight into ways to manage the complexities of the classroom. Working together, the partners were able to secure state funding for the competitive Literacy for Learning, Living, and Leading (L4GA) grants to cover things like sub pay and formal professional development for teachers.

Essential 5. The fifth essential is for “engagement in and public sharing of the results of deliberate investigations of practice by respective participants” (NAPDS, n.d., para 4). Sharing the partnership outcomes continues to be an ongoing process with presentations at many national and international conferences such as the International Academic Forum, the Hawaii International Conference on Education, National Association of Professional Development Schools, and the International Conference of the Association for Positive Behavior Support. One important outcome of the PBIS initiative was the assistance in the development of the *Georgia Positive Behavior Interventions and Supports (PBIS) strategic plan 2014-2020* (Georgia Department of Education, 2014) and the associated rules that became the first ever PBIS endorsement program for teachers (Georgia Professional Standards Commission, 2019).

Essential 6. The sixth essential is an “articulation agreement developed by the respective participants delineating the roles and responsibilities of all involved” (NAPDS, n.d., para 4). Early in the partnership, stakeholders met on several occasions to develop a comprehensive articulation agreement which is reviewed each year and updated as needed. The roles were outlined as seen below.

- Georgia College Responsibilities:
 - Goal 1: To improve educational opportunities for children enrolled in the school:
 - Provide human resources (teaching candidates) to lower teacher-pupil ratios;
 - Provide focused, differentiated instruction in tutoring and small groups based on teaching candidate assignments;
 - Assist in improving achievement levels;
 - Prepare interns with methods reflecting best practices.
 - Goal 2: To provide both informal and formal professional development for

- Baldwin County teachers and Georgia College teaching candidates:
- Provide support in school-wide professional learning programs and activities as requested;
 - Facilitate in-classroom demonstrations and assistance as requested;
 - Interact with school faculty in ways that promote professional growth.
- Goal 3: To administer teacher education standards and evaluation associated with certification:
- Communicate supervision and accreditation standards;
 - Provide efficient procedures for evaluation requirements;
 - Provide direction of intern mentoring and supervision.
- Baldwin Schools Responsibilities:
 - Goal 1: To provide exemplary teacher education opportunities for teaching candidates:
 - Model best practices in all curricular areas;
 - Model differentiated instruction;
 - Model progressive practices (discipline, inclusion, etc.);
 - Mentor interns by supervising and providing feedback to planning and teaching;
 - Provide supervised opportunities to develop independence in teaching;
 - Adhere to standards and requirements associated with certification;
 - Seek opportunities to collaborate with Georgia College faculty for professional learning.
 - Goal 2: To facilitate inquiry and research at the school site in accordance with BCSD policy and Georgia College Institutional Review Board Policies:
 - Assist in obtaining permissions for inquiry and research, in accordance with federal statues and Baldwin County Schools policies;
 - Facilitate requirements for Institutional Review Board approval;
 - Willingness to engage in inquiry and support teaching candidates' requirements;
 - Provide access to institutional data and assessment/test data for research purposes, as legally permitted (Georgia College & State University & The Baldwin County School District, 2015, pp.1-2).

Essential 7. Built into the articulation agreement is the seventh essential for “a structure that allows all participants a forum for ongoing governance, reflection, and collaboration” (NAPDS, n.d., para 4). The University faculty and administrators, classroom teachers, and school administrators continue to suggest new ways to enhance the partnership and meet on a monthly basis. With the addition of a high school teacher career academy, a new pathway to becoming a teacher is now being explored where the University and District will partner to provide a seamless entry into the teaching profession.

Essential 8. The eighth essential is “work by college/university faculty and P–12 faculty in formal roles across institutional settings” (NAPDS, n.d., para 4). As the partnership developed, the superintendent was awarded faculty status and invited to teach courses for the university. Likewise, District and University faculty, teachers and administrators are involved in shared initiatives and committees.

Essential 9. The ninth essential is “dedicated and shared resources and formal rewards and recognition structures” (NAPDS, n.d., para 4). Teams worked together to identify resources to use in professional development and collaborative research. As it relates to recognition, the District, Superintendent, and teachers have been recognized during award ceremonies at the University and University personnel have been recognized by the District. Based on the nine essentials, there were many collaborative efforts that benefited both entities, and the participants all agreed that the nine essentials were followed.

Category 2: Reading and Mathematics Literacy Support

One of the first collaborative activities that we worked on was to apply for literacy grants to support reading improvement in the District. This was determined by the superintendent and elected board of education to be an essential goal for the incoming administration. Because the District, which serves a total of seven schools, did not have grants management staff, the University’s grants center assisted in all aspects of the preparation and application process to prepare the grant. In 2016, we were awarded the “K-2 Mathematicians and Writers” literacy grant and began implementation of the literacy program within each of the P-12 schools in the District. Supplemental assistance was provided through a University faculty member with expertise in literacy who was reassigned one course per semester to work in the District, which was paid from the grant.

Over the course of the next two years, the PDS partnership continued the “Read Baldwin County” initiative. The designated faculty member continued to work within the District in its implementation and eventually was assigned by the University to work full-time within the District to support literacy and act as the PDS liaison between the partners. An additional literacy faculty member supported the program in the summers.

This arrangement allowed the University to have teacher candidates’ field placements occur in classrooms where literacy professional development and implementation was taking place at the ground level. We could then test the theoretical concepts out with real students in a P-12 field-based settings, which resulted in a three-fold benefit to teacher candidates, the District, and its students. An added benefit to this arrangement was that it allowed the University to offer a Reading Endorsement through state certification within the District.

As new opportunities arose, the partnership expanded its collaborative efforts. The next opportunity was to work on Middle Grades science, technology, engineering, and mathematics (STEM) in a partnership that also included the arts called “STEAM Ahead”, which began in 2017 and has continued through the submission of multiple subsequent grants. This effort allowed the University to provide a faculty member a course reassignment to oversee this STEAM project which provided professional development to the District’s middle grades teachers. We also brought our middle grades teaching candidates to the school for on-site classes and observations.

One thing PDS leaders learned through this process is that many granting agencies look for a strong partnership between PDS entities when making funding decisions. The strength of the continuing partnership between our two entities has played a role in the partnership’s ability to continue to obtain grant funding. Overall, there was a significant improvement in the District’s College and Career Readiness Performance Index (CCRPI) scores when comparing schools from the 2014 baseline to 2017 (see Tables 4 & 5). The CCRPI score reflects content mastery and include achievement scores in English language arts, mathematics, science, and social studies based on student performance on the statewide Milestones assessments (Georgia

Department of Education, 2019). Although the results are not significant, there is a positive gain. Note that the 2018 data cannot be used in any comparisons. The state of Georgia has redone the CCRPI algorithm which prevents direct comparisons from previous years (see: <https://www.gadoe.org/CCRPI/Pages/default.aspx>).

Table 4: College and Career Readiness Performance Index (CCRPI) data

	2014 CCRPI	2017 CCRPI
BH Elementary	71	69
CS Elementary	71	73
ER Elementary	55	61
MW Elementary	52	56
OH Middle School	59	60
BH High School	66	76
Note: Numbers are rounded off; Data source: http://ccrpi.gadoe.org		

Table 5: County-wide College and Career Readiness Performance Index (CCRPI) comparison: 2014 to 2017

Mean ^a -Mean ^b	t	df	P (one-tailed)
-3.5	-2.05	5	0.04
Note: Data includes all four elementary-level schools, one middle school, and the one high school. 2014 serves as the baseline and is compared to 2017. Note that in 2018 CCRPI rubrics were changed and cannot be compared to previous years.			

Category 3: Developing and Supporting Joint Programs

Four programs that are based on the independence and interdependence of the professional development school partnership are the Early College program, the Montessori Academy, and a community butterfly house and garden and the newly-established educational doctorate.

The partnership between the District and University includes an Early College program located on a university campus (see: <https://www.gcsu.edu/earlycollege>). This program, which serves approximately 300 primarily first generation and at-risk middle and high school students, allows participants to complete their daily Georgia middle and high school education requirements at the University. High school student participants are allowed to dually enroll at the University to attend college courses. The Early College Program benefits College of Education teacher candidates, as well, in that it enables them the opportunity to have field placement in the same location as their education courses, which is important for students without transportation. The program consistently achieves 100% college placement of high school seniors.

Another recent example of collaboration between the partners is the creation of a Montessori Academy at the District's Early Learning Center (see: <https://montessorielc.com/>). The Academy serves children aged 6 weeks to Kindergarten, and provides parents access to the Montessori delivery model. Employees of the Academy are certified teachers and trained in Montessori. District and University employees have priority in enrolling their children and, once they are all enrolled, all additional seats are open to students from the community.

A third emerging program involves the District, University and Milledgeville Rotary Club. The Club will provide funding and volunteer support for a butterfly house and community garden. The partnership of the Dean of Education and Superintendent, both Rotary Board members,

demonstrated that there is a strong partnership which showed the Rotary it was an initiative worth making the investment.

A fourth program that supports the PDS relationship is the new educational doctorate that supports leaders in the District. Two District principals are already enrolled with more applying to enter subsequent cohorts. The doctorate was formed to help support current and emerging leaders in the District so they would not need to drive hours away for a program.

Category 4: Positive Behavior Interventions and Supports

Another important component of the partnership involves collaboration in the area of Positive Behavior Interventions and Supports (PBIS). Through the partnership's monthly meetings, assistance with district-wide behavior management was identified as a need in the District and also a need for teacher candidates so that they could observe, develop, and implement positive behavior management approaches. Because PBIS is a statewide initiative in Georgia, the District applied to become a PBIS district. After introducing school District representatives to the staff of the Georgia DOE's PBIS team, the DOE's team agreed to assist the District. The resulting student behavior support process began during Spring Semester 2015, when the University assigned a professor with an extensive background as a practitioner in behavior support to work with the District as a professor-in-residence in its efforts to address behavior management.

The behavior support process adopted by the PDS partnership was multifaceted, including components of establishing, training, and supporting the use of PBIS as the District's framework for managing student behavior. In tandem with this effort, the partnership established a district-level behavior support program and related processes, contributions to a partial reconfiguring of the existing student code of conduct, and behavior management support program for teachers whose classroom management practices caused administrators concern. In order to supplement the District's new proactive approach, the superintendent hired the District's first behavior specialist, a former social worker with experience in counseling youth in a local mental health setting. The professor-in-residence met extensively with the new behavior specialist.

Next, the superintendent requested that the professor-in-residence conduct initial introductory training sessions pertaining to PBIS and proactive behavior management prior to the advent of District implementation on the first day of the fall term in 2015. During the summer of 2015 the professor-in-residence planned and conducted professional development training sessions in PBIS for District administrators, school-based PBIS leadership teams, existing teachers, and new teachers alongside the District's superintendent and PBIS coordinator.

The Office Disciplinary Referral (ODR) data tracked throughout the initial year of implementation reflected an immediate and substantial decline in district-wide office referrals and a decrease in the District's suspension rates across each of its seven schools. According to Georgia Department of Education data, referrals were greatly reduced (see tables 6 & 7). This trend largely continued throughout the following two school years among each of the District's elementary schools with progress fluctuating somewhat at the middle and high school levels.

Table 6: District-wide office disciplinary referral data (2014 to 2016)

School	2014 Referrals	2016 Referrals
BH Elementary	270	153
CS Elementary	249	374
ER Elementary	734	578
MW Elementary	367	230
OH Middle School	1508	1193
BH High School	2748	1420
Total	5876	3948
Mean	979	658

Note: Data includes referrals from all six schools in the District. 2017 and beyond could not be compared due to systematic changes in the data collection; Data source: <https://www.gadoe.org/schoolsafetyclimate/Pages/Student-Discipline.aspx>

Table 7: District-wide office disciplinary referral comparison (2014 to 2016)

Mean ^a -Mean ^b	t	df	P (one-tailed)
321	+1.53	5	0.09

Note: data includes referrals from all six schools in the District. 2017 and beyond could not be compared due to systematic changes in the data collection.

PBIS challenges. Challenges are expected with the implementation of any PDS initiative, and this partnership was no exception. Initial challenges reported by the professor-in-residence included procuring entrée into schools and the cooperation of schools' administration and faculty. However, once the superintendent articulated her backing and support of the professor as an equal partner in PBIS implementation, cooperation among staff increased dramatically, and the resulting relationships flourished throughout the extent of the faculty member's involvement with the District. As an example, at the beginning of the professor's involvement in Fall 2015 an elementary principal was unresponsive to requests to hang student-friendly PBIS matrix posters in key locations throughout the building (a common component of PBIS implementation), arguing that the posters would damage wall paint. The superintendent spoke privately with the principal, helping him to understand that she backed all PBIS-related suggestions and expected him to work with the professor as her designee in the initiative. From that moment forward, the principal became an active partner-and ultimately an advocate-of PBIS-related practices such as this one.

Another challenge to the behavior support component of the PDS partnership was one not atypical in many such cooperative efforts-mission creep. The professor-in-residence, who had served as an investigator into allegations of discrimination in his previous P-12 directorship, was asked to conduct a time-consuming formal Human Resources investigation into allegations that one of the District's administrators had discriminated against a student with disabilities. Though the faculty member was willing and able to conduct the investigation, the investigative process proved to be extensive and detracted somewhat from the time he was able to devote to monitoring district-wide PBIS implementation.

Limitations of the Study

The primary limitation of the study is that there can be confounding variables such as changes in the administration and teaching staff, other state, district, and school-wide initiatives, and

community influences. These are often hard to eliminate from something like the CCRPI, which is an overall score for an entire school.

Recommendations for Further Research

The researchers feel that it is important to go beyond the administrators and key personnel looking at the program's success and interview individual teachers to see how they see the partnership. This may lead to new ways to collaborate in the future. In light of the many professional development schools that were not able to sustain the relationship, we need to continue to explore ways to keep our program strong (Dresden, Blankenship, Capuozzo, Nealy, & Tavernier, 2016).

Because PDS partnerships vary greatly depending upon the contexts and dynamics involved between participating partners, the authors are hesitant to generalize beyond the present context. Consistent with the concept of reader generalizability, the reader might best be able to determine whether our experiences are relevant to their own individual contexts.

In summary, the partnership is an overall success. Literacy continues to improve and behavioral incidents continue to decline. Early College and the Montessori Academy are both doing well. Both parties agree that it is important to continue the relationship.

Conclusion

Our PDS model exemplifies how the joint PDS mission has reached beyond each institution's ability to provide the experiences and services in isolation. For example, when the Early College program required space for P-12 students at the University's campus while, in converse, the joint Montessori Academy needed space for its pre-kindergarten children within the District's Early Learning Center. The interdependence in the PDS allows the partners to accomplish the overarching joint mission to improve education at all levels in our community from six weeks old to the doctoral level. The University provides grant assistance, professional development, and courses to K-12 teachers, while the District opens its classrooms for field observation and practice with the University's teacher candidates.

Since 2015, the Professional Development School partnership between the university and the school district exemplifies the PDS guiding essentials of achieving "a comprehensive mission that is broader in its outreach and scope than the mission of any partner and that furthers the education profession and its responsibility to advance equity within schools and, by potential extension, the broader community" (National Association of Professional Development Schools, 2008b). Though the evolution of the partnership, expected challenges have given way to a multi-faceted and highly effective delivery of services that have benefited both the University and the District in a profound way.

References

- Abdal-Haqq, I. (1999). Unraveling the professional development school equity agenda. *Peabody Journal of Education*, 74(3/4), 145–160. Retrieved from <http://www.jstor.org/stable/1493129>
- Al Seyabil, F. (2017). Students' and teachers' views on school-university partnership in the Omani EFL context. *International Education Studies*, 10(3), 125–133. <https://doi.org/10.5539/ies.v10n3p125>
- American Association of Colleges for Teacher Education. (2018a). *Colleges of education: a national portrait*. Washington, DC: Author.
- American Association of Colleges for Teacher Education. (2018b). *A pivot toward clinical practice, its lexicon, and the renewal of educator preparation*. Washington, DC: Author.
- American Montessori Society (n. d.). *What is Montessori education?* Retrieved from <https://amshq.org/About-Montessori/What-Is-Montessori>
- Andrews, P. G., & Leonard, S. Y. (2018). Reflect, analyze, act, repeat: Creating critical consciousness through critical service learning at a professional development school. *Education Sciences*, 8(148), 1–13. <https://doi.org/10.3390/educsci8030148>
- Baldwin County School System. (2015). *Charter system application*. Retrieved from [https://www.gadoe.org/External-Affairs-and-Policy/Charter-Schools/Documents/2 - Baldwin Petition.pdf](https://www.gadoe.org/External-Affairs-and-Policy/Charter-Schools/Documents/2-Baldwin-Petition.pdf)
- Bentley, E., & Hendricks, M. B. (2018). Dreaming big: The ongoing story of the collaboration between a university, a school district, an author, and an illustrator. *School-University Partnerships*, 11(4), 78–86.
- Board of Regents of the University System of Georgia. (2017). *Early college*. Retrieved from <https://www.gearlycolleges.org/>
- Boyer, E. L. (1996). The scholarship of engagement. *Bulletin of the American Academy of Arts and Sciences*, 49(7), 18–33. Retrieved from <http://www.jstor.org/stable/3824459>
- Breault, R. (2014). Power and perspective: the discourse of professional development school literature. *Asia-Pacific Journal of Teacher Education*, 42(1), 22–35. <https://doi.org/10.1080/1359866X.2013.869547>
- Caparo, M. M., Caparo, R. M., & Helfeldt, J. (2010). Do differing types of field experiences make a difference in teacher candidates' perceived level of competence? *Teacher Education Quarterly*, 37(1), 131–154.
- Carpenter, B. D., & Sherretz, C. E. (2012). Professional development school partnerships: An instrument for teacher leadership. *School-University Partnerships*, 5(1), 89–101.
- Chang, D. F., Chen, S. N., & Chou, W. C. (2017). Investigating the major effect of principal's change leadership on school teachers' professional development. *IAFOR Journal of Education*, 5(3). <https://doi.org/10.22492/ije.5.3.07>
- Colwell, C., MacIsaac, D., Tichenor, M., Heins, B., & Piechura, K. (2014). District and University perspectives on sustaining professional development schools: Do the NCATE standards matter? *Professional Educator*, 38(2), 1–12. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1048336.pdf>

- Cressey, J. M., Whitcomb, S. A., McGilvray-Rivet, S. J., Morrison, R. J., & Shander-Reynolds, K. J. (2018). Handling PBIS with care: scaling up to school-wide implementation. *Professional School Counseling, 18*(1), 90–99. <https://doi.org/10.1177/2156759X0001800104>
- Creswell, J. W., & Plano Clark, V. L. (2006). *Designing and conducting mixed methods research*. Thousand Oaks, CA: Sage.
- Darling-Hammond, L. (1994). *Professional development schools: schools for developing a profession*. New York: Teachers College Press.
- Darling-Hammond, L. (1998). Teacher learning that supports student learning. *Educational Leadership, 55*(5), 6–11.
- Darling-Hammond, L. (2010). Teacher education and the American future. *Journal of Teacher Education, 61*(1-2), 35–47. <https://doi.org/10.1177/0022487109348024>
- Darling-Hammond, L., & Bransford, J. (Eds.). (2005). *Preparing teachers for a changing world: What teachers should learn and be able to do*. San Francisco: Jossey-Bass.
- Darling-Hammond, L., Ramos-Beban, N., Altamirano, R. P., & Hyler, M. E. (1998). *Be the change. Reinventing school for student success*. New York: Teachers College Press.
- Denzin, N. K., & Lincoln, Y. S. (2011). *The SAGE handbook of qualitative research*. Thousand Oaks, CA: Sage.
- Dresden, J., Blankenship, S. S., Capuozzo, R. M., Nealy, A. U., & Tavernier, M. D. (2016). What is a PDS? Reframing the Conversation. *School-University Partnerships 9*(3), 64–80. Retrieved from <http://napds.org/wp-content/uploads/2016/10/93-all.pdf>
- Georgia College & State University & The Baldwin County School District. (2015). *Memorandum of understanding*. Milledgeville, GA: Authors.
- Georgia College & State University. (2016). *Our path to preeminence: The 2016-2021 Georgia College strategic plan*. Retrieved from <https://www.gcsu.edu/>
- Georgia Department of Education. (2014). *Georgia positive behavior interventions and supports (PBIS) strategic plan 2014-2020*. Atlanta, GA: Author. Retrieved from <https://www.gadoe.org>
- Georgia Department of Education. (2019). *A family's guide to Georgia's College and Career Ready Performance Index*. Atlanta, GA: Author. Retrieved from <https://www.gadoe.org>
- Georgia Professional Standards Commission. (2019). *Positive behavior intervention and supports (PBIS) endorsement program*. Atlanta, GA: Author. Retrieved from <https://www.gapsc.com/Rules/Current/EducatorPreparation/505-3-.109.pdf>
- Goodlad, J. (1990). *Teachers for our nation's schools*. San Francisco: Jossey-Bass.
- Goodlad, J. (1994). *Educational renewal: better teachers, better schools*. San Francisco: Jossey-Bass.
- Gordon, G., & Morse, E. V. (1975). Evaluation research. *Annual Review of Sociology, 1*, 339–361.
- Hirsch, S. E., Brown, C. P., Halley, E. A., Beach, J., MacSuga-Gage, A. S., Spence, S. E., & Kennedy, M. (2019). Ten tips to consider when creating and screening PBIS films. *Beyond Behavior, 28*(2), 79–89. <https://doi.org/10.1177/1074295619845830>

- Holmes Group. (1986). *Tomorrow's teachers: a report of the Holmes Group*. East Lansing, MI: Holmes Group. Retrieved from <https://files.eric.ed.gov/fulltext/ED270454.pdf>
- Holmes Group. (1990). *Tomorrow's schools: principles for the design of professional development schools*. East Lansing, MI: Holmes Group.
- Horner, R. H., Kincaid, D., Sugai, G., Lewis, T., Eber, L., Barrett, S., & Johnson, N. (2014). Scaling up school-wide positive behavioral interventions and supports: experiences of seven states with documented success. *Journal of Positive Behavior Interventions*, 16(4), 197–208. <https://doi.org/10.1177/1098300713503685>
- Horner, R. H., Sugai, G., & Lewis, T. (2015). *Is school-wide positive behavior support an evidence-based practice?* Retrieved from <https://www.pbis.org/research>
- Johnson, B. R., Onwuegbuzie, A. J., Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research*, 1, 112–133. <https://doi.org/10.1177/1558689806298224>
- Jupp, V. (Ed). (2009). *The Sage dictionary of social research methods*. Los Angeles, CA: Sage.
- Levine, M. (1992). *Professional practice schools: linking teacher education and school reform*. New York: Teachers College Press.
- Levine, M. (1998). *Designing standards that work for professional development schools*. Washington DC: National Council for the Accreditation of Teacher Education.
- Lewis, S., & Walser, T. M. (2016). Advancing a professional development system: evolution and evaluation. *School-University Partnerships*, 9(3), 130–152.
- Lowry, R. (2019). *Concepts and applications of inferential statistics*. Retrieved from <http://vassarstats.net/textbook/index.html>
- Montessori Academy at the Early Learning Center (n. d.). *About*. Retrieved from <https://montessorielc.com/about>
- Murrell, P. C. (1998). *Like stone soup: The role of the professional development school in the renewal of urban schools*. New York: AACTE Publications.
- National Association for Professional Development Schools. (2019). *Vision, purpose, history*. Retrieved from <https://napds.org/visionpurposehistory/>
- National Association for Professional Development Schools. (2008a). *9 essentials*. Retrieved from <https://napds.org/nine-essentials/>
- National Association for Professional Development Schools. (2008b). *What it means to be a professional development school*. Retrieved from <https://napds.org/wp-content/uploads/2014/10/Nine-Essentials.pdf>
- National Association for Professional Development Schools (n.d.). *The nine required essentials of a PDS*. Retrieved from <https://napds.org/nine-essentials/>
- Netzel, D. M., & Eber, L. (2003). Shifting from reactive to proactive discipline in an urban school district. *Journal of Positive Behavior Interactions*, 5(2), 71–79. <https://doi.org/10.1177/10983007030050020201>
- Newman, W. L. (2011). *Social research methods: qualitative and quantitative approaches* (7th ed.). Boston, MA: Allyn & Bacon.

- Nzarirwehi, J., & Atuhumuze, F. (2019). In-service teacher training and professional development of primary school teachers in Uganda. *IAFOR Journal of Education*, 7(1). <https://doi.org/10.22492/ije.7.1.02>
- Parker, A. K., Parsons, S. A., Groth, L. A., & Brown, E. L. (2016). Pathways to partnership: a developmental framework for building PDS relationships. *School-University Partnerships*, 9(3), 34–48.
- Parsons, B., & Renyi, J. (1999). Breathing the professional development school spirit into all schools. *Peabody Journal of Education*, 74(3/4), 263–276. Retrieved from <http://www.jstor.org/stable/1493137>
- Polly, D., Reinke, L. T., & Putnam, S. M. (2019). Examining school-university partnership: synthesizing the work of Goodlad, AACTE, and NAPDS. *School-University Partnerships*, 12(3), 24–40.
- Renyi, J. (1996). *Teachers take charge of their learning. Transforming professional development for student success*. Washington, DC: The National Foundation for the Improvement of Education.
- Richey, R. C., & Klein, J. D. (2007). *Design and development research*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Ronen, I. (2018). The impact of organizational and personnel changes on a college-school partnership vision. *Teacher Development*, 22(5), 668–684. <https://doi.org/10.1080/13664530.2018.1473288>
- Schack, G. D. (2011). Multiple roles and relationships of professional development school liaisons: the struggle for collegiality within hierarchical settings. *Peabody Journal of Education*, 74(3/4), 306–309. Retrieved from <https://www.jstor.org/stable/1493142>
- Sugai, G., & Horner, R. H. (2009). Responsiveness-to-intervention and school-wide positive behavioral supports: integration of multi-tiered system approaches. *Exceptionality*, 17, 223–237. <https://doi.org/10.1080/09362830903235375>
- Teitel, L. (2004). Two decades of professional development school development in the United States. What have we learned? Where do we go from here? *Journal of In-service Education*, 30(3), 401–416. <https://doi.org/10.1080/13674580400200335>
- Tracz, S. M., Beare, P., & Torgerson, C. (2018). A longitudinal case study of a school-university partnership for training teachers. *The Journal of School Administration Research and Development*, 3(1), 42–56.
- Walsh, M. E., & Backe, S. (2013). School–university partnerships: reflections and opportunities, *Peabody Journal of Education*, 88(5), 594–607, <https://doi.org/10.1080/0161956X.2013.835158>

Corresponding author: Robert Sumowski
Contact email: Robert.sumowski@gcsu.edu

Acronyms

AACTE: American Association of Colleges for Teacher Education

COE: College of Education

CCRPI: College and Career Readiness Performance Index

DOE or GaDOE: Georgia Department of Education

GCSU: Georgia College & State University

MOU: Memorandum of Understanding

NAPDS: National Association for Professional Development Schools

ODR: Office Disciplinary Referral

PBIS: Positive Behavior Interventions and Supports

PDS: Professional Development School

SW-PBIS: School-wide Positive Behavioral Interventions and Supports

STEM: Science, Technology, Engineering, and Mathematics

STEAM: Science, Technology, Engineering, Arts, and Mathematics

Reviewers for Volume 7 – Issue 2

The editorial team would like to thank the following reviewers for their contributions to peer review for this issue of the journal. Their dedication and assistance are greatly appreciated.

Jose Barlis
Santosh Behera
Christina Belcher
Angelina Borican
Ivy Chia
Shiao-wei Chu
Caroline Dacwag
Denise de Souza
Alaster Douglas
Tania Fonseca
William Frick
Beena Giridharan
Alice Schmidt Hanbidge
Elaine Huber
Habsah Hussin
Leda Kamenopoulou
Intakhab Khan
Lynda Leavitt
Jin Lee
Andrew Leichsenring
Thelma Manansala
Teri Marcos

Catalino N. Mendoza
Alyson Miller
Lena Mishieva
Massoud Moslehpour
Suja Nair
Nomazulu Ngozwana
Anuli Njoku
Agnes Papadopoulou
Elena Raevskikh
Cornelius Riordan
Ilana Ronen
Bethe Schoenfeld
Raimond Selke
Meliha Simsek
Pearl Subban
Consortia Tan
Anna Toom
Daniel Velasco
Kyle Whitfield
Yoshihiko Yamamoto
Tony Yeigh
Huanshu Yuan

