**Editorial policies**

*Open Praxis* is a peer-reviewed open access scholarly journal focusing on research and innovation in open, distance and flexible education. It is published by the International Council for Open and Distance Education—ICDE.

The aim of *Open Praxis* is to provide a forum for global collaboration and discussion of issues in the practice of distance and e-learning.

*Open Praxis* welcomes contributions which demonstrate creative and innovative research, and which highlight challenges, lessons and achievements in the practice of distance and e-learning from all over the world.

*Open Praxis* provides immediate open access to content on the principle that making research freely available to the public supports a greater global exchange of knowledge.

*Open Praxis* is a quarterly journal published in January–March, April–June, July–September and October–December.

Research articles and innovative practice articles are subject to double-blind peer review by a minimum of two Reviewers.

Authors need to register with *Open Praxis* prior to submitting, or if already registered can simply log in and begin the 5 step submission process.

**Editorial team**

*Editor*
Inés Gil-Jaurena, Universidad Nacional de Educación a Distancia (UNED), Spain

*Consultative editor*
Beatriz Malik, Universidad Nacional de Educación a Distancia (UNED), Spain

*Editorial board*
Hemlata Chari, University of Mumbai, India
Gangappa Kuruba, University of Botswana, Botswana
Thomas P. Mackey, SUNY Empire State College, New York, United States
Alan Tait, The Open University, United Kingdom
Belinda Tynan, RMIT University, Melbourne, Australia
Joel Warnican, University of the West Indies, Barbados
Yang Zhijian, Open University of China (OUC), China

**Publisher and contact information**

ICDE—International Council for Open and Distance Education
Drammensveien 211
0281 Oslo, Norway

editor@openpraxis.org
www.openpraxis.org
http://dx.doi.org/10.5944/openpraxis
ISSN 2304-070X

**Journal history**


**Copyright notice**

Authors who publish with this journal agree to the following terms:

a. Authors retain copyright and grant *Open Praxis* right of first publication with the work simultaneously licensed under a Creative Commons Attribution 4.0 International License that allows others to share the work with an acknowledgement of the work’s authorship and initial publication in *Open Praxis*.

b. Authors also grant ICDE right to publish a printed compendium of *Open Praxis* published articles in an annual basis.

c. Authors are able to enter into separate, additional contractual arrangements for the non-exclusive distribution of the journal’s published version of the work (e.g., post it to an institutional repository), with an acknowledgement of its initial publication in *Open Praxis*.

*Open Praxis* does not necessarily agree with opinions and judgements maintained by authors.
# Table of Contents

**Editorial**

**Introduction to *Open Praxis* volume 12 issue 4**  
Inés Gil-Jaurena  
437

**Research articles**

- **Exploring the impacts of distance higher education on adult learners’ lives and reclaiming lifelong learning as a human development process**  
  Claudia Neves & Susana Heníques  
  439

- **Tutoring support as a predictor of student retention in distance learning: The case of a University in Ghana**  
  Vera Arhin & John Ekow Laryea  
  457

- **Open and Distance Learner Engagement with Online Mediation Tools: An Activity Theory Analysis**  
  Judy Corinne Noeline Pullenayegem, K. Radhika M. De Silva & Buddhini Gayathri Jayatileke  
  469

- **The Influence of Social Presence on Students’ Satisfaction toward Online Course**  
  M. Khalid M. Nasir  
  485

- **Evaluation and Improvement of students’ satisfaction in Online learning during COVID-19**  
  Fayyaz Ahmad Faize & Muhammad Nawaz  
  495

- **An Evaluation of Online Proctoring Tools**  
  Mohammed Juned Hussein, Javed Yusuf, Arpana Sandhya Deb, Letila Fong & Som Naidu  
  509

- **What About Reuse? A Study on the Use of Open Educational Resources in Dutch Higher Education**  
  Marjon Baas & Robert Schuwer  
  527

- **Impact of OER in Teacher Education**  
  Denise Cummings-Clay  
  541

- **Student Perceptions of Textbooks: Prior Behaviors and Beliefs Can Influence Zero Textbook Cost (ZTC) Adoption Impact**  
  AmberNicole Pfannenstiel, Alex Redcay & Daniel Albert  
  555

**Book Review**

- **Book Review of *Teaching and Learning with Technology: Pushing boundaries and breaking down walls***  
  Reviewed by: Ramesh Chander Sharma  
  569

**List of reviewers 2020 (volume 12)**  
573
At the end of this difficult year, we present the fourth Open Praxis issue in 2020, which includes nine research papers and one book review. A total of 22 researchers from nine different countries—Portugal, Ghana, Sri Lanka, Malaysia, Pakistan, Fiji, The Netherlands, USA and India— in five continents have authored these items.

In the first paper (Exploring the impacts of distance higher education on adult learners’ lives and reclaiming lifelong learning as a human development process), Claudia Neves and Susana Henriques, from the Open University of Portugal, present a survey-based tracer study about the impact of an online Degree in Education on the graduates’ lives. The study serves as an input to reflect about the relevance of lifelong learning and its intersection with digital literacy.

In the second paper (Tutoring support as a predictor of student retention in distance learning: The case of a University in Ghana), Vera Arhin and John Ekow Laryea, from Ghana, explore a relevant topic in distance education—retention—through a survey-based correlational study. While they conclude that tutoring support does not predict retention, they use the transactional distance theory to interpret the data and identify different aspects of tutoring that may be of interest for other distance educators.

In the third paper (Open and Distance Learner Engagement with Online Mediation Tools: An Activity Theory Analysis), Judy Corinne Noeline Pullenayegem, K. Radhika M. De Silva and Buddhini Gayathri Jayatilleke, from the Open University of Sri Lanka, deal with another relevant topic in distance education: engagement with tools in a course. Using a mixed methods approach and the Activity Theory as a framework, they explore the low engagement of the students with five tools and the tensions that arose in the analysed course. The findings provide interesting insight for e-learning practitioners.

In the fourth paper (The Influence of Social Presence on Students’ Satisfaction toward Online Course), M. Khalid M. Nasir, from Malaysia, focuses on learners’ satisfaction and uses another well-known model in distance education: the community of inquiry (CoI) framework. The study finds a positive correlation between social presence in an online course and students’ satisfaction, and the author suggests a series of elements to consider in online course design and development.

In the fifth paper (Evaluation and Improvement of students’ satisfaction in Online learning during COVID-19), Fayyaz Ahmad Faize and Muhammad Nawaz, from Pakistan, report on the shift to online teaching that their institution has faced due to the pandemic. They focus on students’ experiences and explain the process of collecting learners’ feedback and incorporating their suggestions to improve the emergency solutions; these changes led to greater satisfaction levels. The experience may be of use to many other universities that are undertaking similar transitions to online education.

In the sixth research paper (An Evaluation of Online Proctoring Tools), Mohammed Juned Hussein, Javed Yusuf, Arpana Sandhya Deb, Letila Fong and Som Naidu, from Fiji, also explore an issue that has become more relevant in recent times due to the pandemic: e-assessment and the use of online proctoring tools. They have identified and tested different proctoring tools and present a detailed study of their functionalities, and include mock trials with the tool Proctorio, both with staff and students.
The authors conclude with a series of considerations, useful for institutions and practitioners who are planning to use this type of tools.

The last three research papers refer to Open Educational Resources.

In the paper What About Reuse? A Study on the Use of Open Educational Resources in Dutch Higher Education, Marjon Baas and Robert Schuwer, from The Netherlands, deal with and under-explored issue in the research about OER: their reuse. The authors present a survey-based study about teachers’ practices in their country and report about different aspects of the use and reuse of OER, such as access, awareness and volition to use these educational resources, and dark reuse. The study provides an interesting panorama and considerations for further research.

In the next paper (Impact of OER in Teacher Education), Denise Marie Cummings-Clay, from the USA, contributes to the literature on comparative studies that analyze if the use of OER or traditional commercial textbooks leads to different student achievement. Being a finding of her study that there are not significant differences, the author advocates for OER and compiles different considerations in the OER adoption process, including the relevance of costs.

Closing the research papers section, AmberNicole Pfannenstiel, Alex Redcay and Daniel Albert, also from the USA, present another study focused on the adoption of OER (Student Perceptions of Textbooks: Prior Behaviors and Beliefs Can Influence Zero Textbook Cost (ZTC) Adoption Impact). They explore students’ perceptions using a questionnaire, and report on aspects such as cost savings or access the learning materials, but also about students’ previous beliefs about, for instance, if they can pass a class without a textbook. This paper, as the previous one, contributes to the literature that, especially in North America, explores textbooks costs and advocates for OER.

Finally, the issue includes a book review by Ramesh Chander Sharma, who has reviewed the book Teaching and Learning with Technology: Pushing boundaries and breaking down walls, edited by Som Naidu and Sharishna Narayan and published in 2020 by The University of the South Pacific Press.

We wish these contributions will be of interest and use for our readers, especially in these times of COVID-19 pandemic, when research and grounded reflection are needed to inform institutional, pedagogical and technological decisions that many universities in the world have to make.

We specially thank all the reviewers who have collaborated in reviewing the papers submitted to Open Praxis volume 12. Their names and affiliations are included in the full issue and in the journal website (http://openpraxis.org/index.php/OpenPraxis/pages/view/reviewer).
Exploring the impacts of distance higher education on adult learners’ lives and reclaiming lifelong learning as a human development process

Claudia Neves & Susana Henriques
Universidade Aberta - Open University Portugal (Portugal)
Claudia.Neves@uab.pt & Susana.Henriques@uab.pt

Abstract
This article intends to launch discussion and reflection on two main themes: lifelong learning and digital literacy in nowadays societies. In looking for the intersections between these concepts to connote them with a more humanistic and holistic perspective, we explore the potentials of distance learning in the lives of adult learners. The empirical basis for this exploration is a survey applied to 706 (143 respondents) graduates in the education of the Portuguese Open University to know their future projects and the impact of this degree in the various dimensions of their personal, social and professional lives. The conclusions of this analysis point to recognition, by the respondents, of the positive impacts that distance higher education has in their personal and social lives. However, these impacts are not as visible in professional terms since the answers show little significant professional progressions. In this sense, the article concludes that it is important to rethink the founding ideas of the concept of lifelong learning from a humanistic perspective and to approach it with a holistic and transversal conception of what is now defined as digital literacy. Distance education, for adult learners, is a scenario that not only strengthens the personal, social and professional development of individuals, but also the development of competencies applied not only to the digital world but also to each person’s daily activities.

Keywords: Adult Education, Lifelong Learning, Online Higher Education, Human Development, Portuguese Open University graduates

Introduction
This article focuses on the pathways and living conditions of students of the Portuguese Open University (UAb), who complete their higher education degrees in adulthood, working full-time, specifically, graduates of the Degree in Education. The main goal of the research presented in this article is to know the students’ future projects and the impacts of this degree in the various dimensions of their lives, both personal and professional.

This is an area that has attracted a growing research interest that has been carried out on Portuguese graduates (Gonçalves, 2000; Alves, 2003; Alves, 2005; Gonçalves & Menezes, 2014; OPSD-UA, 2015). This growing interest stems from changes, on the one hand, in social, economic and political conditions at the global and national levels and, on the other hand, on the increase of students entering adult higher education at a later stage of life than the traditional one (shortly after completing high school in an ongoing school course).

The issues that concern adults in higher education and their pathways after completion of the first cycle of higher education are particularly important in this article, as Portuguese Open University students have a specific profile –working adults, with family and professional responsibilities. In the panorama of Portuguese higher education institutions, the singularity of Portuguese Open University stems not only from the profile of its students but also from the fact that it is the only Portuguese public university in distance education.
The Portuguese Open University degree in Education follows a curricular structure that combines a ‘major’ that guarantees a basic curriculum in Education with two ‘minors’, understood as training courses that guarantee the deepening of knowledge in a scientific and professional area, according to the training project of each student (Minor in Social Pedagogy and Education and Minor in Education and Reading).

The student that chooses this graduate course is usually somebody who wants to improve skills to understand and intervene in the educational field and also develop skills to intervene in different contexts of formal and non-formal education, contributing to the development of individuals and social groups. This Degree is intended for persons wishing to perform functions within social organizations and institutional bodies with educational responsibilities.

Responding to the demands of the Digital Society, the Open University Education graduates have the professional skills to intervene in systems, programs, projects, processes and educational and training actions, in face-to-face and digital contexts, as well as in-depth intervention skills in processes of development throughout the life of people and groups, in the personal, professional, social and cultural contexts.

The data analyzed in this paper results from the application of a questionnaire built within the scope of the Observatory of Professional and Life Pathways of the Graduates of the Open University. This questionnaire was prepared in 2015, with slight adjustments (which do not compromise the comparability of data between different moments of collection) in the first semester of 2017. The questionnaire is composed of questions that are grouped into 5 large blocks, reflecting the dimensions that intended to analyze:

(a) the profile of graduates, including social origins, area of residence and educational and professional path, prior to the course;
(b) the course at the Open University, the reasons and modalities for admission, the duration of its completion, the professional situation throughout the course and the conditions of study;
(c) the balance of skills and relationships, including the respondents' representations about the skills developed and the relationships built in the degree;
(d) the perceived impact of the degree, not only on working conditions and trajectories, but also on family, cultural and civic life;
(e) future projects, including needs and interests of higher education and throughout life.

The questionnaire was applied to all individuals who completed their degree in Education at UAb between 2011 and 2015, in two phases:

(i) the first phase of information collection took place between July and October 2015 and was addressed to all those who had completed their degree in 2011, 2012 or 2013. Of the 272 graduates in this three-year period, 77 (28.3%) responded.
(ii) the second phase of information collection took place during the month of May 2017 and was addressed to all who had completed their degree in 2014 or 2015. Of the 162 graduates in this biennium, 66 (40.7%) responded.

In this article we intend to explore and understand:

• Different perspectives on Lifelong Learning and articulations between lifelong learning and Digital Literacies and the intersections between both perspectives.
• The impact of the Education degree in the Portuguese Open University in the various dimensions of the students' lives (personal, social, and professional).
Literature Review

Reclaiming the point of Lifelong learning

The importance of lifelong learning is crystallized in our societies through documents and speeches published by supranational and national organizations worldwide such as the OECD (Organisation for Economic Co-operation and Development) UNESCO (United Nations Educational, Scientific and Cultural Organization), the World Bank and the European Union (EU). Thus, educational reforms, particularly in the European Union countries, since the 1990s have been guided by the recommendations of these international organizations that, through an abundant production of documents and the development of statistical projects, emphasize the centrality of education and its ability to guarantee employability, avoiding social exclusion, promoting citizenship and personal development. The desired scenarios for the evolution of societies in the official discourses and documents emphasize the importance of learning and access to skills, competencies, and knowledge, as determinants of an adaptation of societies to the globalization of economies and technological and social changes (UNESCO, 2016). At the heart of this vision is the idea of Lifelong Learning.

The attributes most commonly associated with the idea of lifelong learning are the fact that it is associated with the entire life cycle and, in addition to being lifelong, it is also associated with all contexts and spheres of life (life wide) (Barrett & Garrett, 2009).

These various intergovernmental influences that circulate around lifelong learning mean that its definition remains vague and imprecise, needing to have a critical analysis in order to be implemented as a political project. In a previous research Neves (2005) focused on the comparison of lifelong education policies between five member states of the European Union and relating them to the specific contexts from which they emerge. The conclusions pointed that, although there is a strong pressure for the governments of the European Union to shape their education and training policies according to supranational recommendations and guidelines, the truth is that education and training systems national training programs continue to be influenced by a broader social, economic, political and cultural context. As a consequence, there is no single model of education and training policies that prevails and the trends that emerge are naturally and inevitably complex. At the same time there are several theoretically frameworks around the lifelong learning idea.

Berglund (2008) presents a synthesis of the most common theoretical perspectives in lifelong learning research identifying three groups of theoretical frameworks. In a first group, Berglund refers to conceptual and philosophical studies, related to the issue of values, where one usually seeks to define and problematize learning as a concept or a phenomenon. Most of the research in this group is based on the analysis of lifelong learning over time. The research is usually extensive in nature and analyses different philosophical and ideological perspectives around education, economics and learning, relating most individual aspects to the aspects linked to the development of societies (Berglund, 2008). In the second group identified by Berglund (2008), we have research on lifelong learning that focuses on the political analysis on the phenomenon, and seeks to deepen issues related to education, the economy and the relationship with global markets, the processes of globalization, the purposes of models of development, democratic participation and building active citizenship, implementing policies, etc. In a third group, Berglund (2008) refers to studies that focus on the different social contexts where lifelong learning occurs, such as schools, learning communities, universities, companies, etc., etc. The author draws attention to the fact that these research themes are not mutually exclusive, on the contrary, the boundaries that separate them are not always clear, and it is often difficult to separate research on lifelong learning from research on education.
We believe that the research presented in this article does not fit into the groups mentioned above, because we start from a broad understanding of what lifelong education is and do not focus on a concept of lifelong education circumscribed in formal contexts of learning, or at specific ages. The study presented here is part of the analysis of a set of data related to the graduates of a degree obtained at an open university, a formal course, but seeks to read these data in the light of a conception of lifelong learning as a process of personal, social and professional construction very much related to the basic principles of distance education.

Hence there are several conceptual debates around lifelong education but mainly they focus essentially on the different connotations and interpretations that it has been subject to, depending on the political objectives it aims to achieve (Field, 2006; Biesta, 2006; Canário, 2003; Lima, 2003). Authors like Biesta (2006) state that the discourses on lifelong learning promote a conception centred on the individual, instead of being a collective project. In this sense, the author refers that this subject has been transformed from a right, to a duty (Biesta, 2006), which has serious consequences for the way education and learning are viewed.

Other authors (Hyslop-Margison & Sears, 2006; Coffield, 1999) also focus on the meaning of lifelong learning and how far it seems to be far from the philosophical ideals that founded it. This argument is still one of the main tensions that characterize the debates around lifelong learning: its use focused on a more economic, and less humanistic, sense. Based on many reflections are the economic concerns that are moved by the importance of knowledge and skills for economic development. This perspective collides with a more humanistic one of education that establishes that the main purpose of development is the development of societies in a just and cohesive way, where people are the main source of wealth. The very same international organizations that popularized these concepts diverged with the meaning attributed to it, more economic or more humanistic. Authors such as Kallen (1996), Lima (2002, 2003), Canário (2003, 2006) and Jarvis (2007) argue that it is the economic perspective that has gained greater relevance in policies around the world, favouring the accentuation of a utilitarian paradigm of education and its economic function.

This transformation in the idea of lifelong learning for Roldão (1996) is related to the changes in the structures and mechanisms of social functioning and to the changes in the role of the school in society, that have created a permanent need to reconvert and update the professional skills of individuals throughout life. As for school, its massification has made its traditional functions extrapolated and new functions are now required, which are not only about literacy skills but also about social skills and competencies, habits and values that help individuals to cope better with the accelerated dynamism and changes in everyday life.

In this perspective, the context of accelerated changes in Information and Communication Technologies (ICT), where people and institutions need to be in permanent “recycling” to better manage and adapt their knowledge and skills, provides dilution of the boundaries between school and life in society. These scenarios lead individuals to be in constant updating and reconversion of skills and competences and bring serious consequences for education that transform, in the opinion of some authors, the true meaning of the educational process. One of these authors is Biesta (2005) who points out serious criticisms on the fact that the language of education has been replaced by the language of learning. Based on his argument Biesta states that during this replacement something very important has been lost and has to be reclaimed, so we need to reinvent the language of education. According to Biesta (2005), the education process became a set of economic transactions, where the learners are seen as consumers with specific needs that must be met by educational institutions. This type of criticism alerts to the fact that the use of lifelong learning may be creating an excessive weight in the need to accumulate learning, neglecting an important dimension of the educational process that goes beyond the mere achievement of skills and competences.
In this perspective, the educational process also integrates concerns, doubts, and risks that oblige the learner to face problems in different contexts and, therefore, to define himself as an individual in society. So, today’s global context and, more precisely, the economic pressures led to this and other perversions of the real meaning of education, where the more pragmatist and technocratic perspectives subordinate lifelong learning only to a succession of skills and competences, forgetting, as Lima (2002) points out, the “substantivity of life”.

Despite these criticisms, lifelong learning is ideologically intended to be a process that serves economic, social and personal purposes. This concept takes a holistic form that goes beyond the boundaries of time, space and context. The proponents of this critical view (Field, 2003; Aspin & Chapman, 2001) argue that this inclusive perspective of lifelong learning rejects the division between periods of schooling and post-schooling and that to promote and maximize opportunities for all to learn, it is important to increase the development of learning communities to meet the idea of a learning society.

Based on the studies of Aspin and Chapman (2001), in which, after a review of the different views on lifelong learning, we also reject the idea that a single definition of lifelong learning can be reached. As an alternative, these authors propose three elements as the essence core of lifelong learning and that encompass the main characteristics that this concept assumes both in politics, in practice, and the academic field. The three elements are framed for the purposes that are assigned to lifelong learning: i) to provide economic development and progress; ii) to provide personal development; iii) and to provide social inclusion and democratic participation and activity. From these three elements, the authors highlight the complexity of the interconnections and interdependencies that exist between them and the consequences they bring to education.

The Role of Distance Education in Adult Learners Digital Literacies

Nowadays, digital literacies are considered to be part of the knowledge process. Though it’s easy to believe those new generations and considered to be digital natives, born in technological environments used to interact with others and to perform daily activities, older generations are not as well prepared to explore digital and technological innovations. Nevertheless, adult learners need more access, at less cost, to learning processes and that need is changing scenarios and strategies for universities worldwide. The global, knowledge-based economy defies traditional universities to rethink their mission, purposes, structures, and programs, and in response, new organizations are emerging.

Digital literacy is considered to be, by most experts around the world, as one of the key competences for lifelong learning development and active citizenship participation in nowadays’ societies. According to Jimoyiannis (2015), the main argument is that people who can understand and effectively use digital means are more likely to be empowered, take advantage of educational opportunities, and achieve success in many dimensions and activities of their social, economic and personal lives. But the conceptual framework around Digital Literacy is far from being consensual. This lack of consensus is thickened when the concept of digital competence is introduced. As Dias de Figueiredo (2019) states, there is an irresistible tendency to accentuate separations instead of valuing conscientiousness when new concepts emerge in the academic field, an inheritance that the author attributes to Cartesian thought. This tendency, according to the author, is verified when we use the “digital” qualifier to separate the digital activities of all the others, privileging technical visions of the digital competences that ignore the human and social dimension. For the author, digital literacy and skills are cultural, political and ethical phenomena that go far beyond the merely instrumental use and function. The main argument of Dias de Figueiredo (2019) is that competences and knowledge
should not be confused. They are both important but used in different situations and contexts. But there is no point in separating digital competences from other competencies that are not digital, because digital competences are cultural and complex, transversal and multidimensional (Dias de Figueiredo, 2019). As an example, the author refers to the digital reality where activities such as interaction and communication demand for skills and competences at the same time that traditional academic knowledge in specific domains is developed. This kind of scenario is very common in digital learning platforms, such as moodle, according to specific pedagogic models, such as the one used in the Portuguese Open University.

The Open University activity is guided by the Virtual Pedagogical Model (Pereira et al., 2007; Mendes et al., 2018), which is based on the following fundamental principles:

(i) student-centred learning, which means that the student is active and responsible for building one’s knowledge;
(ii) learning based on the flexibility of access to learning (contents and activities), which means the absence of temporal or spatial imperatives. This principle embodies on the primacy of the asynchronous communication, which allows non-coincidence of space and non-coincidence of time, since communication and interaction are processed as it is convenient for the student, allowing the student time to read, process information, reflect, dialogue and interact;
(iii) learning is based on the diversified interaction between student-teacher, between student-student, and between student and content resources. This principle is embodied in various communication devices that the teacher plans and conceives according to the specific pedagogical strategy;
(iv) learning as a promoter of digital inclusion, understood as the facilitation of the use of Information and Communication Technologies (ICT), as well as the development of skills and competences for the analysis and production of digital information.

In this model the student is integrated into a learning community that has permanent access to open educational resources, learning objects, e-activities, debates, and sharing of experiences. Throughout the course, students will have the opportunity to experiment with various tools and web interfaces that will allow them, to not only achieve disciplinary knowledge but also acquire and experiment sociocultural skills and competences to use ICT, interact and communicate with others.

This pedagogical model of the Portuguese Open University is close to the idea of Digital Literacy proposed by Jimoyiannis (2015) who defines multiple aspects of digital literacy and presents an operational framework addressing the various skills, competencies, and attitudes determining digital literacy for adult learners. The author states that the multiplicity of literacy practices has led to a new term, multiliteracies, which emphasizes the different ways and tools used by people today for written, visual and multimodal information and communications practices. In this sense, Jimoyiannis (2015) states that Digital Literacy reflects a wide range of skills, competences, knowledge, and attitudes about the use of ICT to achieve goals related to personal and social development and employment. In his own words “It is a broad concept reflecting the awareness, attitude and ability of individuals to appropriately use ICT tools I the context of specific life, work and learning situations” (Jimoyiannis, 2015, p. 4).

Even though digital literacy is a concept surrounded by different interpretations and perspectives it is usually associated with other concepts equally used with different meanings according to different contexts. Since its first use by Glister (1997) digital literacy has been overused and has come to assume a variety of designs and meanings as a result of recent scientific, technological and digital innovations (Aires et al., 2019). Following this assumption, the authors conclude that, although there
is already some literature that demonstrates that this concept is used in different perspectives, its analysis has not been done in an integrative way. For the authors, digital literacy presents a socio-cultural dimension that must be analysed as an evolutionary process, not reducing itself to the effective capacity of the use of digital resources. Regardless of the lack of integration of perspectives on this concept, we share the idea of Aires et al. (2019) when they say that considering that this conceptual model is still in development, the contribution of digital literacies should be seen in a holistic and lifelong human development perspective.

But what do the education graduates from a Distance Education university perceive? What impacts did they feel on a personal, social and professional level?

**Adult learners in Distance Education: results from a survey about the impacts of a higher education experience**

The following part of this article intends to explore the perceptions that adult students that attended an education course at the open university in Portugal have on the impacts of this course at a personal, social and economic (professional) level.

**Data, methods, and survey**

As previously mentioned, the data presented and analysed in this article is the result of a questionnaire survey developed within the Observatory of Professional and Life Paths of Graduates of the Open Portuguese University (UAb). This questionnaire was prepared in 2015 and had slight adjustments (which do not compromise the comparability of the data between different collection moments) in 2017. The questionnaire consists of questions grouped into five large blocks, reflecting the dimensions that were intended to be analysed:

(i) the profile of the graduates, including social origins, area of residence and educational and professional curriculum, before the course;
(ii) the course in the Open University, the reasons and modalities of entry, the duration of its accomplishment, the professional situation throughout the course and the conditions in which the students carried out the degree;
(iii) the balance of competences and relations, including the representations of the respondents about the competences, developed and the relations established during the graduation course;
(iv) the perceived impact of the academic degree, not only on working conditions and trajectories but also on family, cultural and civic life;
(v) and future projects, including needs and interests of higher education and lifelong learning.

This questionnaire was applied to all individuals who completed their degree in Education from UAb between 2011 and 2015, in two phases: i) the first phase of data gathering took place between July and October 2015 and was addressed to all those who had completed their degree in 2011, 2012 or 2013. Of the 272 education graduates in these three years, 77 (28.3%) answered; ii) the second phase of the data gathering took place during the month of May 2017 and was addressed to all those who had completed their degree in 2014 or 2015. Of the 162 graduates in this biennium, 66 (40.7%) answered. The definition of this time interval was considered time enough to allow the identification by graduate students of the impacts of the degree in their life—at least 2 years after the conclusion of the degree.

The questionnaire was sent online using the LIME Survey platform, made available from a link that reached the graduate students from their email address.
It should be noticed that the following analysis deals with the data as a whole, thus fulfilling the anonymity commitment of the respondents.

**Findings**

Between 2011 and 2015, 434 students graduated in Education in the Portuguese Open University, however, only 143 graduates answered this questionnaire, and 72% of those respondents are female. The high rate of feminization confirms a broader tendency in Europe where more and more women attend higher education courses (Alves & Lopes, 2015) and, in particular, the courses related to educational dimensions (Prá & Cegatti, 2016). In addition to the majority of respondents being women, the average age is 45 years and about half of the respondents resided during the graduation course in areas with higher population density.

The survey intended to identify data on the work condition of the family of the students. When questioned about the occupational professions of the parents, more than 40% of the respondents said that the nuclear family of origin has (or had) industrial occupations (father) and rural activities (mothers), that is, occupations that require low levels of schooling. The professional occupations of the parents is an important element for the characterization of the social origin of the respondents, which reinforces the notion that the graduates in Education of the Portuguese Open University are non-traditional students in paths of upward social mobility. This movement accompany, to some extent, the transformations of the country in the last decades concerning schooling and sectors of professional activity.

*What were de professional occupations and academic experiences of the students before and after the graduation in Education?*

Regarding the professional activity of the graduates in Education, they were asked about two moments: before the beginning of the course and after the course is completed. Before graduation, 32% of the students performed administrative and similar functions, followed by the functions related to the services and sales sector. After completing the course, we noticed a slight increase in the number of graduates who were in academic and scientific professions and technical jobs. In similar reducing the number of graduates engaged in professions associated with administrative and similar occupations related to services and sales (Figure 1).

![Figure 1: Professional activity before and after graduation.](image-url)
Another interesting indicator relates to the employment situation before and after graduation (Figure 2). The overwhelming majority of the students in the Education course (almost 90%) were working full time during the course, although only 58% had applied for student worker status. This trend confirms the general profile of students at the Open University, which corresponds to students that are already established in the labour market. These students are normally individuals who have been away from the educational system for several years, including workers, adults, and students representing the first generation of their family to attend higher education (Fragoso, 2016).

Concerning the legal regime of the organizations in which they work, about half of the respondents report being employed (76.2%), of which 52.4% are in the public sector and close to 24% in the private sector. As self-employed workers, there are around 6.3%.

For the school pathways, the data indicate that at the moment of admission to the Open University almost 70% of the graduates in Education held a Secondary level of Education; almost 10% had technical or vocational training; only 8.4% already had a higher education degree. Looking in detail at the previous experience of higher education held by the education graduates, the responses revealed that 65% of graduates had never had any type of experience in Higher Education and that about 15% had already started another course at this level of education without having finished it. On a residual basis, about 7% of the graduates were holders of another higher education degree in another institution.

What was it like to experience an online degree in education?

Regarding the length of the course, the reasons that led to its conclusion and the greatest difficulties experienced, students’ responses showed that the vast majority completed the course within the expected time (84%). The reasons for that (Figure 3) were the personal strength (76.8%), the interest of the contents of the course (49.7%), the support of the family (41.9%) and the flexibility that the pedagogical model allows (35.7%). Other reasons were mentioned but with less emphasis such as colleagues (22.4% of the answers), teachers (16.8% of the answers) and less importantly the employer’s support (5.6%).
When questioned about the main reasons that made it difficult to conduct the course, respondents highlighted as main obstacles professional and civic activities, family activities and personal issues, among others with residual expressions, considering the variety of answers obtained. It should be noted that no one showed as difficulties the lack of interest in the course, the difficult and inadequate contents, the use of the online learning platform and the relationship with colleagues, and thus all these aspects are considered positive aspects of the degree. Other reasons were pointed out for the difficulty to complete the degree in the time they had predicted: a short time available for the study activities, financial difficulties, and pregnancy or other health issues.

The most important were: study with flexibility and autonomy (71%) and the possibility of studying without major dislocations (73%). Other reasons were also considered important in choosing the course such as deepening knowledge and culture (57%); achieve favourable working position/condition (53%); and eLearning (54%).

When questioned about whether the learning performed in the course corresponded to the initial expectations, 93.7% indicated that yes, with 2.1% saying no.
The students were also asked about their attendance in the degree course in Education and we analyse their level of agreement regarding a set of dimensions to which they were confronted during the course. Graduates indicated the comfort with the use of the online platform with the highest levels of agreement (78.3% agree). Soon after, we have the fact that online education is an excellent means of learning. These two indicators reinforce the advantages that students recognize in distance education. Almost 60% of respondents fully agree that this mode of teaching and learning provides a sense of belonging to a community, and 55% say they are totally at ease in interacting with peers and teachers. Half the respondents are in complete agreement that they have established friendly ties with colleagues and teachers. Even though there is an absence of answers.
that indicate a total disagreement with these dimensions, we point out that 37% of the students still do not fully agree with the fact that they can establish friendships with colleagues and teachers in the online platform.

*After graduation, what were the impacts of the online degree?*

Regarding the competences and skills developed during the degree in Education, the respondents showed that those that were more developed were the capacity of analysis and synthesis, as well as the autonomy, culture and critical sense. The responses also highlighted the fact that the students believe to have deepened knowledge and foundations on the field of study and professional, communication and technological skills and ability to work in groups.

In terms of the impacts of the degree professionally, socially and personally, we verified by the data analysis that the respondents stated that it was at the social and individual level that they felt the greatest impacts of the degree. This finding comes from the reading of the highest percentages that we observed in Table 2, where they emphasize: feeling to have more critical capacity, planning and innovation ability; being an informed and participative citizen; having the possibility to extend cultural practices and provide enlightened support to family members. In terms of professional impacts, we emphasize that no significant response rates are demonstrating that the degree has helped to exploit employment opportunities, although it has contributed to the development of professional work methods. The respondents also consider that it did not contribute significantly to career progression, although the importance given to the problem-solving capacity acquired during the course is clear.

*Table 2: Preparation of the Degree in Education for professional life*

<table>
<thead>
<tr>
<th>Preparation of the Degree in Education for professional life</th>
<th>Frequency %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explore job opportunities</td>
<td></td>
</tr>
<tr>
<td>Nothing</td>
<td>7</td>
</tr>
<tr>
<td>Little</td>
<td>28</td>
</tr>
<tr>
<td>Quite</td>
<td>28</td>
</tr>
<tr>
<td>Much</td>
<td>11,9</td>
</tr>
<tr>
<td>No answer</td>
<td>25,1</td>
</tr>
<tr>
<td>Methods of professional work</td>
<td></td>
</tr>
<tr>
<td>Nothing</td>
<td>2,8</td>
</tr>
<tr>
<td>Little</td>
<td>20,3</td>
</tr>
<tr>
<td>Quite</td>
<td>35,6</td>
</tr>
<tr>
<td>Much</td>
<td>17,5</td>
</tr>
<tr>
<td>No answer</td>
<td>23,8</td>
</tr>
<tr>
<td>Interacting and solving problems</td>
<td></td>
</tr>
<tr>
<td>Nothing</td>
<td>0,7</td>
</tr>
<tr>
<td>Little</td>
<td>7,7</td>
</tr>
<tr>
<td>Quite</td>
<td>49,6</td>
</tr>
<tr>
<td>Much</td>
<td>21</td>
</tr>
<tr>
<td>No answer</td>
<td>21</td>
</tr>
</tbody>
</table>

*Continued*
Table 2: Continued

<table>
<thead>
<tr>
<th>Preparation of the Degree in Education for professional life</th>
<th>Frequency %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Career Development</strong></td>
<td></td>
</tr>
<tr>
<td>Nothing</td>
<td>41,2</td>
</tr>
<tr>
<td>Little</td>
<td>14,7</td>
</tr>
<tr>
<td>Quite</td>
<td>7,7</td>
</tr>
<tr>
<td>Much</td>
<td>14</td>
</tr>
<tr>
<td>No answer</td>
<td>22,4</td>
</tr>
<tr>
<td><strong>Technology use</strong></td>
<td></td>
</tr>
<tr>
<td>Nothing</td>
<td>6,3</td>
</tr>
<tr>
<td>Little</td>
<td>2,3</td>
</tr>
<tr>
<td>Quite</td>
<td>30,8</td>
</tr>
<tr>
<td>Much</td>
<td>21</td>
</tr>
<tr>
<td>No answer</td>
<td>19,6</td>
</tr>
<tr>
<td><strong>Network of professional contacts</strong></td>
<td></td>
</tr>
<tr>
<td>Nothing</td>
<td>21</td>
</tr>
<tr>
<td>Little</td>
<td>28</td>
</tr>
<tr>
<td>Quite</td>
<td>20,2</td>
</tr>
<tr>
<td>Much</td>
<td>9,8</td>
</tr>
<tr>
<td>No answer</td>
<td>21</td>
</tr>
<tr>
<td><strong>Critical capacity, planning and innovation</strong></td>
<td></td>
</tr>
<tr>
<td>Nothing</td>
<td>4,2</td>
</tr>
<tr>
<td>Little</td>
<td>6,3</td>
</tr>
<tr>
<td>Quite</td>
<td>39,1</td>
</tr>
<tr>
<td>Much</td>
<td>32,9</td>
</tr>
<tr>
<td>No answer</td>
<td>17,5</td>
</tr>
<tr>
<td><strong>Informed and participative citizen</strong></td>
<td></td>
</tr>
<tr>
<td>Nothing</td>
<td>0</td>
</tr>
<tr>
<td>Little</td>
<td>4,2</td>
</tr>
<tr>
<td>Quite</td>
<td>45,4</td>
</tr>
<tr>
<td>Much</td>
<td>38,5</td>
</tr>
<tr>
<td>No answer</td>
<td>11,9</td>
</tr>
<tr>
<td><strong>Extend cultural and leisure practices</strong></td>
<td></td>
</tr>
<tr>
<td>Nothing</td>
<td>2,1</td>
</tr>
<tr>
<td>Little</td>
<td>19,6</td>
</tr>
<tr>
<td>Quite</td>
<td>41,2</td>
</tr>
<tr>
<td>Much</td>
<td>23,1</td>
</tr>
<tr>
<td>No answer</td>
<td>14</td>
</tr>
</tbody>
</table>

Continued
It should be noted that the current Portuguese scenario of the professional integration of graduates is characterized by a general framework of structural unemployment, as a result of the economic crisis that began in 2008. The precariousness and freezing of career progressions are striking features of the Portuguese labour market, which increases the number of precarious and low-paid jobs.

Nevertheless, confronting respondents with the adequacy of the degree to the professional activity they perform, a quarter of the answers refer to the course as fundamental to their professional activity and almost 40% as very useful. 14% of the students report that the degree was irrelevant to professional activity. These data are in apparent disagreement with the fact that a large part of the respondents considered that the degree in Education had little impact on their professional progression. It is thus possible that graduates have chosen this course because they already carry out activities related to the field of education before attending it, or that they have found other ways in their professional activity to put into practice the learning experiences they have done during the course.

In terms of the impacts of the degree course at the professional level, it is also significant that about 63% of the respondents say that the course did not provide any change in the category or professional activity, which coincides with the data discussed above that pointed the usefulness of the degree in the context of professional progression. However, 28% say they have had positive impacts at professional level.

It was important to determine whether these changes in the professional category or professional activity were due to factors related to the qualifications, skills, teachers or colleagues. The data revealed that the determining factors for these professional changes were the qualifications (19.6%) and the acquired competencies (19.6%).

---

**Table 2: Continued**

<table>
<thead>
<tr>
<th>Preparation of the Degree in Education for professional life</th>
<th>Frequency %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informed family support</td>
<td></td>
</tr>
<tr>
<td>Nothing</td>
<td>0</td>
</tr>
<tr>
<td>Little</td>
<td>9,8</td>
</tr>
<tr>
<td>Quite</td>
<td>42</td>
</tr>
<tr>
<td>Much</td>
<td>33,5</td>
</tr>
<tr>
<td>No answer</td>
<td>14,7</td>
</tr>
<tr>
<td>Extended social networks</td>
<td></td>
</tr>
<tr>
<td>Nothing</td>
<td>1,4</td>
</tr>
<tr>
<td>Little</td>
<td>29,4</td>
</tr>
<tr>
<td>Quite</td>
<td>34,2</td>
</tr>
<tr>
<td>Much</td>
<td>21</td>
</tr>
<tr>
<td>No answer</td>
<td>14</td>
</tr>
<tr>
<td>Feeling better and more capable</td>
<td></td>
</tr>
<tr>
<td>Nothing</td>
<td>0</td>
</tr>
<tr>
<td>Little</td>
<td>0,7</td>
</tr>
<tr>
<td>Quite</td>
<td>26,6</td>
</tr>
<tr>
<td>Much</td>
<td>60,1</td>
</tr>
<tr>
<td>No answer</td>
<td>12,6</td>
</tr>
</tbody>
</table>

The degree did not represent a decisive stimulus for the opening of companies or economic activities on their own since only 4.9% of the respondents answered that they had opened their own business or activity. Still, for these, factors such as acquired competences, best qualifications, as well as teachers and colleagues were determinant.

For more than half of the graduates, the degree in education did not make a significant contribution either to improving working conditions (65.7%), to professional stability (82.5%) or to the development of more rewarding work activities (61.5%) (Table 3).

<table>
<thead>
<tr>
<th>In terms of work, the Degree in Education contributed</th>
<th>Frequency %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improvement of working position / conditions</td>
<td></td>
</tr>
<tr>
<td>In the organization where I already worked</td>
<td>24,5</td>
</tr>
<tr>
<td>In another org where I started working</td>
<td>7,7</td>
</tr>
<tr>
<td>On my own</td>
<td>2,1</td>
</tr>
<tr>
<td>No answer</td>
<td>65,7</td>
</tr>
<tr>
<td>Labour stability</td>
<td></td>
</tr>
<tr>
<td>In the organization where I already worked</td>
<td>13,3</td>
</tr>
<tr>
<td>In another org where I started working</td>
<td>3,5</td>
</tr>
<tr>
<td>On my own</td>
<td>0,7</td>
</tr>
<tr>
<td>No answer</td>
<td>82,5</td>
</tr>
<tr>
<td>Rewarding work activities</td>
<td></td>
</tr>
<tr>
<td>In the organization where I already worked</td>
<td>28</td>
</tr>
<tr>
<td>In another org where I started working</td>
<td>7</td>
</tr>
<tr>
<td>On my own</td>
<td>3,5</td>
</tr>
<tr>
<td>No answer</td>
<td>61,5</td>
</tr>
</tbody>
</table>

The participation in professional associations was another dimension analysed in this survey. Revealing that associative movements are not yet a culturally rooted reality since almost 75% of the respondents say they do not participate in any professional association. Residually, about 5% say they have started to participate in this type of association, but not because of the influence of the teachers or classmates. Under these conditions, only 1.4% stated that they started to integrate professional associations.

After graduation, did the students continue to study and attend other courses?

When asked whether they enrolled in another course after completing the degree, 63.4% reported that they are not enrolled in any course. Only 23.8% say they have already enrolled in courses and of these, only 7.7% are enrolled in Open University’s courses. However, when asked whether they would have the same options regarding the choice of course and institution (Figure 4), 67% stated that they would choose the same course at the same University, that is, a degree in Education at the Open University. Almost 15% would choose another course at the Open University and only 1.4% said they would choose another university, which indicates a high level of satisfaction not only with the degree in Education but also with the Open University.
What about expectations for the near future?

Professional expectations for the next three years were one of the in-depth dimensions in this survey (Figure 5). Faced with a set of possibilities, about 44% of the respondents said they expected being promoted and/or changing their position within the organization in which they work. On the contrary, those who expect to stay in the current situation or entering retirement represent 17.5% of the answers to this question.

Regarding future training projects and expectations, we found that 49% of the respondents indicated that they wanted to continue their studies at a postgraduate, master’s or doctoral level and that 35.7% would continue to study participating in short term training actions. Only 10.5% reported that they do not expect to continue to study or participate in training actions. Of all the affirmative answers regarding the continuation of the studies, 69.2% indicate that, if there is an interesting educational offer, they will choose the Portuguese Open University to continue studying.
In conclusion, when asked about the characteristics of a graduate student in Portuguese Open University, the respondents advanced a set of qualifiers and adjectives that were the subject of documentary analysis and can be synthesized the following way: responsible, organized, persistent, motivated, resilient, disciplined, interested, hardworking, dedicated, dynamic. We highlight aspects related to the self-regulation capacity of their learning, but also aspects that call for a collaborative dimension.

Final Discussion

In 2006, Gert Biesta asked the following question: what is the point of lifelong learning if lifelong learning has no point? In this article, we reclaim the point of lifelong learning in a digital society where men and women have to develop skills to undertake their life projects in a personal, social and professional way. We emphasize the meaning of lifelong learning to ensure the development of each person’s life project to be prepared for the unpredictability of life, without forgetting the “substantivity” of life as defended by Lima (2002).

According to the data presented, lifelong learning has a point if we acknowledge this concept as a three-dimensional model that may provide economic development and progress, personal development and social inclusion and democratic participation and activity. Data also shows that graduate students from Portuguese Open University recognize digital means as a form of personal empowerment that allows them to take advantage of educational opportunities and more flexibly and adaptively, such as distance education. Without separating digital competences from other competencies, they also recognize the importance and relevance of competences and abilities such as communication, interaction, cooperation, etc. In conclusion, we propose an approach to distance higher education that reclaims the humanistic and multidimensional value of lifelong learning, using digital learning platforms based on flexibility and adaptability, as a way of developing not only digital competences but also transversal competences in all contexts of life with significant personal, social and professional impact.

References


Papers are licensed under a [Creative Commons Attribution 4.0 International License](http://creativecommons.org/licenses/by/4.0/)

Tutoring support as a predictor of student retention in distance learning: The case of a University in Ghana

Vera Arhin & John Ekow Laryea
University of Cape Coast (Ghana)
varhin@ucc.edu.gh & john.laryea@ucc.edu.gh

Abstract
The tutor's role in enhancing student retention in distance learning is paramount. This study aims to predict retention and not actual retention by investigating how tutoring support predicts student retention in distance learning at the University of Cape Coast in Ghana. Moore Transactional Distance Theory underpinned the theoretical framework of this study. The correlational research design was adopted for the study. The multistage sampling technique was used to sample 727 student participants from a sampling frame of 8731 out of which 625 was used for the analysis. A structured questionnaire was used to collect data. Data were analysed using descriptive and inferential statistics. The findings of the study revealed that the respondents had a positive perception towards tutoring support offered at the University. However, at an alpha level of .05 tutoring support made a non-significant contribution to prediction (p = .11). The findings further, revealed that a unit increase in tutoring support will improve student retention by 1.42 times. Implications of the study were also discussed.

Keywords: distance learning, tutoring, retention, student support

Introduction
Obtaining a postsecondary education has become a necessity in the contemporary world, due to the demand for people to gain more knowledge and acquire new skills for employment requirements. McFarlane (2011) acknowledges that we are living in a school economy and people are seeking some form of training and education to improve skills and prospects for work. Adams (2011) affirms that “a large number of students attend college with the hope of obtaining a degree which society says is the new prerequisite for a middle-class life” (p. 19). This and other factors have in recent times brought distance learning to the forefront of educational practice.

Freeman (2010) defines distance learning as an educational delivering where the tutor and students' are separated by time, location or both. This can either be synchronous (real-time classroom facilitation led by a tutor at the same time) or asynchronous (when the interaction between the tutor and students is not linked at the same time). Similarly, Schlosser and Simonson (2009) assert that distance learning is a formal education process where the learning group is separated and interactive telecommunications systems are used to connect learners, resources and tutors. Distance learning is thus a normal education process whereby the tutor and the student are not physically on site. One advantage of this educational process is that, it is flexible and offers opportunity for people to combine learning with other activities such as work and family related issues.

Despite its flexibility, retention of students has been identified as one of the greatest weaknesses in modern distance learning (Anderson, 2011; Harewood Cox, 2015; Nichols, 2011). This weakness has engulfed many distance learning institutions across the world, and distance institutions of higher learning are increasingly becoming conscious of putting much emphasis on student retention. Seidman (2012) asserts that although institutions have responded to student retention issues by implementing...
programmes and services to enhance retention, the retention rate has not yet improved. Similarly, Bukholder et al. (2013) pinpoint that despite research and theorisation that have taken place for nearly more than 50 years, student retention rate in distance learning remains not only relatively low but also has remained relatively stable. Pluhta and Penny (2013) and Tschechtelin (2011) aver that retaining students in institutions of higher learning are essential to a nation’s development because of its economic effect in increasing human capital.

Nichols (2011) argues that there is no standard definition for retention; however, some retention experts have defined retention based on their own theoretical perspective. Noel-Levitz (2008) defines retention as the successful completion of a student’s academic goals of degree attainment. Berger et al. (2012) define retention as the ability of an institution to keep students from the point of admission to graduation. Retention is therefore seen as a function of an institution’s responsiveness to keep its students. Retention in this study refers to a student’s persistence on a programme of study until completion.

A study conducted by American College Testing (ACT, 2010) on “What works in student retention in higher education” revealed varied findings depending on the nature of the institution and the institution’s students’ body. The study findings revealed some successful approaches to enhance retention as freshmen seminars and summer orientations, tutoring support, enhanced academic advisement, early warning systems and interventions for students. However, Kiguwa and Silva (2007) believe that a tutor’s attitude towards students, is essential for academic success and helps to keep students in school until graduation. Tutoring refers to the act of helping and supporting the learning process of people in an interactive, purposeful and systematic way (Topping, as cited in Zambrano & Gisbert, 2015). Tutoring is therefore seen as a social process where learning skills are improved through interaction.

The University of Cape Coast (UCC) which operates on a dual mode system, runs campus-based mode and the distance learning mode. The College of Distance Education (CoDE) is the distance learning wing of the UCC. The distance form of learning is not an open learning form and there are admission criteria attached to it. Students who wish to enroll in the distance education programme must meet the university’s admission requirements. The CoDE for some time now has gained significant advances in its graduation rate, nonetheless, improvement is still needed in the college retention rates. The trend has been that most first-year class sizes are very large, but decrease gradually every year, making retention rates to be low at CoDE.

Several studies had been conducted to investigate measures that can enhance students’ retention at the college. Studies that have investigated this phenomenon include that of Arhin and Wang’eri (2018) and Akwamuah-Boateng and Boadu (2013). Although the College has made tremendous efforts to put in place some measures based on the recommendations of the studies, retaining students at the college is still a problem. Over time, if the situation is not dealt with, the College is likely to lose its responsibility to educate students. Hupfeld (2007) believed that no single factor can predict student retention. Kalsbeek and Zucker (2013), opine that retention is institutional and sometimes culture specific and as such institutions need to find out what works best for them. This therefore calls for other interventions that can enhance retention of students at the college.

The purpose of this study was to examine if tutoring support predicts students’ retention in distance learning. Specifically, the following objectives were used to guide the study. To:

- Examine students’ perception of tutoring support provided at the College of Distance Education.
- Investigate if tutoring support predicts retention of students at the College of Distance Education.
**Theoretical Framework**

Moore’s (1983; 2013) Transactional Distance Theory underpinned the theoretical framework of this study. The theory enunciates that distance education is not simply a geographic separation of learners and teachers, but is a pedagogical concept. Moore posits that there is a psychological and communication gap between the student and the tutor which can lead to misunderstandings and feelings of isolation. It is this distance in the relationship of the two partners that Moore referred to as ‘transactional distance’.

Moore (1983) points out that when talking about distance education teaching environment, the separation between the teacher and learner requires special organisations and teaching procedures. These procedures fall into two clusters: the independence that each learner requires in the teaching and learning process; and the requisite structure that the tutor brings to bear to ensure that students meet the necessary learning objectives. Moore (1983) identifies three variables: dialogue, structure and autonomy in the learning environment and indicates the importance of dialogue and its effectiveness in solving the learning concerns of learners. Moore describes dialogue as interactions between the teacher and the learner which are determined by the extent to which learners and teachers are able to respond effectively to each other. Structure is the extent to which educational programmes accommodate or respond to each individual learner’s needs. In this case if the learner finds the structure not to be relevant to his/her needs, he or she will not persist and will drop out from the programme of study. Autonomy on the other hand refers to the extent to which learners decide on certain factors such as what to learn, how to learn and when to learn (Moore, 2013).

Transactional Distance Theory was adopted for this study because it is an important theory that continues to attract research interest in distance education. It summarises the importance of the medium of communication in the distance learning environment, the quality of interactions and the programmes support responsiveness to the individual learner’s needs. For example, when tutors are well prepared for a class and are able to deliver the content such that it caters for the learners need, the structure in the Transaction distance is catered for. Further, students are able to communicate effectively with their tutors and tutors are available for consultation, the need for dialogue is also catered for. Finally, when students receive information on how to study from the tutors, are motivated to learn by tutors and their individual differences is considered, then the need for autonomy is also catered for.

Moore (1983) asserts that as the learner acquires expertise, the need for structure decreases and autonomy increases, which lead to learning pattern of behaviours that are more constructive. Saba and Shearer (as cited in Saba 2012) conducted a study to test Moore’s theory and their findings revealed that, in each case when structure increases, transactional distance increases whereas transactional distance decreases when dialogue increase.

**Literature Review**

Mustafa (2018) explored students' perceptions about how tutoring support affects them. A total of 25 students were randomly selected to participate in the study. A survey was given at the end of the semester to all participating students. Students expressed great satisfaction with the service and indicated a need for such assistance in lower division engineering classes. The study revealed that tutoring was perceived to improve the success rate of students as it helped students in lower division of an engineering class to be retained in school.
Zhan et al. (2013) examined Hong Kong students’ perceptions of the effectiveness of private supplementary tutoring relative to mainstream schooling. Using a mixed method design, both quantitative and qualitative data were collected using 1646 students for the quantitative data while 101 students were interviewed from among those that responded to the questionnaire. After data analysis, the findings revealed that students generally perceived tutoring support to be more effective in the provision of examination support compared with mainstream schooling.

In another study, Segoe (2014) investigated tutor support role in upgrading of the student-teacher at the University of South Africa, using a sample size of 25 out of 155 final year students. A qualitative approach was adopted. The responses were transcribed, coded and four themes were generated from the data. The findings of the interview data revealed that the majority of the respondents had a positive perception towards tutoring support. They contended that during contact sessions most tutors offer good support. However, some of the students were of the view that they did not communicate much with the tutors on how to plan their own workload, information about course structure and organization. Participants acknowledged that they need encouragement from their tutors, particularly at the start of each course to boost their confidence. The findings concluded that tutoring plays a critical role in the student upgrading which helps to enhance students’ retention.

Further, Alisha (2016) investigated the role of faculty (in terms of the educational services they provide) in retaining students in a university in middle Georgia. Ten faculty members at the university were randomly sampled and participated in a face-to-face interview. The data was analysed using a thematic approach. Findings revealed that the faculty members believed their activity affect students’ retention. They further suggested activities such as improved student engagement, building better faculty and student rapport, developing concrete retention goals, and implementing a mentoring programme.

Furthermore, Grillo and Leist (2013) examined the relationship between the long-term use of academic support services such as tutoring, learning assistance, and supplemental instruction and retaining students till graduation making use of a 6-year data from the University of Louisville’s Resources for Academic Achievement Unit. A hypothesis test was conducted to determine if a large quantity of time spent engaging students in academic support services is associated with a higher likelihood of graduation. The study revealed that there is a relationship between academic support of tutors and retention of students.

Mori (2015) explored how tutors support in the form of supplementary tutoring impacts Japan and USA students’ retention on a programme. Four thousand, five hundred students from both schools were sampled. The findings did not obtain any statistically significant in retention from the two countries. The implication given was that, student’s retention was more likely to be dependent on other factors and not only on tutoring support.

Although not comprehensive, the few studies reviewed showed that students have positive perception towards tutoring support services. Further, the reviews on tutoring support revealed that whereas some of the findings statistically influence students’ retention, others did not. This study contributes to local literature on how tutoring support relates to retention of distance students at the University of Cape Coast on the premise of Moore’s theory on ‘Transactional distance’ (with reference to dialogue). Kostina (2011) explored the relationship between autonomy, student-tutor dialogue and satisfaction at a Russian language web-based and found that, autonomy, dialogue and satisfaction had significant correlation at the beginning and the middle point of the course. However, the relationship among them significantly decreased towards the end of the course.
Methodology

The correlational research design was adopted for the study. The purpose of correlational research design is to verify the relationship between or among variables and also predict group membership. According to Creswell (2014), correlational research design is useful when a researcher is interested in investigating the degree of association between two or more variables. With this method, the predictor variable (tutoring-support) was measured and its correlation with the outcome variable (retention of students) computed. Later, prediction of the model was tested to explain the resultant correlation. This research design was suitable for the study because the aim of the study was not actual retention but to predict retention.

The total population of 13,915 was made up of 12,265 Education and 1,650 Business second year students from the then 10 regions of Ghana. However, the sampling frame for the study was made up of 8731 second year students in four regions (Greater Accra, Ashanti, Northern and Central) purposively selected for the study. These regions were the three zoned regions and the headquarters of the college. The four regions were ideal because they have a greater population forming the cream of the total students at the college. The second-year students were chosen because it is at this level that a student can make a genuine and an informed decision about his or her willingness to remain or drop out of college (Noel-Levitz, 2015; Arhin & Wang’eri, 2018).

A sample size of 727 was derived from the sampling frame 8731, using Krejcie and Morgan (1970) sample size determination table. The multistage sampling technique was employed for sampling participants. First, the percentage of students in the sampled frame was calculated to determine the percentage of students per region using the proportionate to size sampling technique. Subsequently, the stratified random sampling technique was used to select the participants from the subgroups. After the stratification, the simple random sampling method was used to select participants from each stratum to be included in the study.

The main instrument for data collection was the questionnaire. A structured questionnaire was divided to obtain primary data from the respondents. The questionnaire had two main sections (A-B) under the subheading: tutoring support, and students’ intention to stay in school. Section A made use of a 5-point Likert type scale which had 10 items to elicit responses on tutoring support. These items were used to measure some characteristics of the tutor that can predict students’ retention. Section B was a binary Likert scale, made up of ten questions and was used to solicit responses on students’ intentions to remain or drop out of school.

Items on the questionnaire were valid as experts in the field of Educational Psychology advice and input were immersed to reflect the knowledge required for the stated objectives. The instrument for the data collection was pilot tested with 73 (10% of the total study sample) which was made up of Education (n = 15) and Business (n = 58) second year students in one of the regions that was not sampled for the actual work. This sample size for the pilot study was based on Connelly (2008) sample size for a pilot study which states that 10 percent of the actual sample size of a study is ideal. After the analyses of the data, the internal consistency obtained through Cronbach’s alpha coefficient was .74, falling in the acceptable regions of .70 which, according to Streiner (2003) is reliable, hence the use of the instrument for data collection.

Both descriptive (percentages, frequencies, means and standard deviations) and inferential statistics (tetrachoric correlation coefficient) were used for the analyses. The perceptions of students on tutoring support were measured on the scale ranging from 1 (strongly disagreed) to 5 (strongly agreed). However, participants who obtained ($M \leq 3$) were classified as having negative perceptions while participants with ($M \geq 3.1$) were classified as having positive perception. The highest mean a respondent could
attain in all the 10 items measuring perception on tutoring support was \( (M = 5) \) and the lowest mean a respondent could obtain was \( (M = 1) \). Students’ intention to stay in school was measured using 10 items in a binary Likert scale. All statements were worded in negative and an agreement to a statement was coded ‘0’ while a disagreement to the statement was coded ‘1’. The highest score a respondent could obtain was \( 1 \times 10 = 10 \) (meaning the respondent has a high probability of remaining on the programme until graduation) and the lowest score was \( 0 \times 10 = 0 \) (meaning the respondent has a high probability of dropping out of the programme).

Subsequently, to predict group membership of a respondent’s intention to stay in school or not to stay in school and for the criterion variable to be amenable for the binary logistic regression test, the scores of respondents on the 10 items were re-categorised into two. Respondents who had a total retention value score of 5.0 or more were categorised as those who had a high probability of staying on the programme while respondents who had a retention value score less than 5.0, were categorised as those who had a higher probability of dropping out of the programme.

A tetrachoric correlation coefficient \( (r) \) was conducted to establish whether the predictor variable has a statistically significant relationship with the criterion variables. The test was conducted at the \( p = < .05 \) level of significance. Then after, the logistic regression analysis was performed to predict group membership of student participants’ intention to stay in school or not to stay in school. The logistic regression was appropriate because it employs binomial probability theory; in which only two values are used to predict the probability of a person belonging into one group rather than the other (Osborne, 2014).

The researcher gave due consideration to the legal framework governing the conduct of this research. All participants were assured of their anonymity and confidentiality. They were assured that any information provided would be used for the purpose of the study only. Participants were also assured that any information that would identify them (such as names of their study centres) will not be included in the study. Participation in the research was voluntary and participants were made to sign a written informed consent form. Also, participants were free to refuse or withdraw from the study at any time with no ramification. In addition, anything that infringed on their right as participants was avoided.

**Results**

After the collection and cleaning of the data, 625 (51% females and 49% males) valid participants’ responses were used for the analyses. This yielded a response rate of 86 percent. For research objective one, which examined the perception of students on tutoring support provided at the College, the descriptive statistics were used to describe the set of data. The result is presented in Table 1.

The results in Table show respondents have positive perception towards tutoring support offered to students at the university. This is evidenced by the mean of mean score of 3.49 and a standard deviation of 1.21 which is an indication of homogeneous responses. The item (tutors engage students’ in meaningful discussions) yielded the highest score of \( (M = 3.83, SD = 1.06) \). However, items measuring “My tutors encourage students to ask questions in class” and “My tutors motivate me to learn” recorded the lowest scores of \( (M = 2.22, SD = 1.23 \) and \( M 2.32, SD = 1.27 \) respectively.

The research objective two, investigates whether tutoring support predicts retention of students in distance learning. In order to find an answer to this objective, the scores of respondents on the 10 items used to measure students’ intention to stay in school were re-categorised into two. Respondents who had a total retention value score of 5.0 or more were categorised as those who had a high probability of staying on the programme while respondents who had a retention value score less than 5.0, were categorised as those who had a higher probability of dropping out of the programme. The result is presented in Table 2.
The distributions in Table 2 show that the majority of the respondents 81 percent in Group 2 have higher probability of staying on the programme. This group of respondents scored more than 5 on the student retention sub-scale. Only 19 percent of the respondents are in Group 1 and have the propensity of dropping out from the college.
Table 3. Logistic Regression Predicting Respondents’ Intention to stay on the distance programme from tutoring support

<table>
<thead>
<tr>
<th>Predictor</th>
<th>B</th>
<th>Wald X²</th>
<th>P</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tutoring Support Services</td>
<td>.35</td>
<td>2.51</td>
<td>.11</td>
<td>1.42</td>
</tr>
<tr>
<td>Constant</td>
<td>1.24</td>
<td>47.56</td>
<td>.00</td>
<td>3.45</td>
</tr>
</tbody>
</table>

Subsequently, the tetrachoric correlation coefficient ($r_{tc}$) test was performed to establish the relationship between the two variables. A test of correlation between the two variables $r(623) = .06$, $p = .15$ was found. The level of significance obtained from the correlation between the two variables was more than the level of significance at which the test was performed. This implies that tutoring support and retention of students in distance learning are not significantly correlated.

Further, the logistic regression analysis was conducted to predict retention of students in distance learning using tutoring support as the predictor. A test of the full model against a constant only model was not statistically significant, indicating that the predictor did not reliably distinguish between students’ retention and their non-retention $\chi^2 (df = 1, N = 625) = 2.45$, $p = .12$. Prediction overall success rate was 81.4 percent. *Nagelkerke’s $R^2$* of .01 indicates a weak relationship between prediction and the grouping. The probability of obtaining the chi-square statistics given that the null hypothesis is true is (2.45). The *p*-value, which is compared to a critical value, .05 to determine if the overall model is statistically significant is greater than .05. In this case, the model is not statistically significant.

Table 3 presents the logistic regression coefficient, Wald test, and odds ratio for the predictor (tutoring support).

Employing a .05 criterion of statistical significance, tutoring support made a non-significant contribution of prediction ($p = .11$) which is more than the criterion significance ($p < .05$). The results supported the null hypothesis and concluded that tutoring support is not a significant predictor of retention of students in distance learning. Although tutoring support was not a significant predictor of retention of student in distance, the prediction of the model revealed that a unit increase in tutoring support will improve student retention by 1.42 times. The probability that a student who has a positive perception on tutoring support will stay on the programme is .83.

**Discussion**

Findings from the analysis for research question one revealed that, out of the 10 tutor characteristics measured on tutoring support, the study found that eight of the characteristics were rated positively by the respondents. The two that were perceived negatively by the respondents could be that, first, the students are distance learners and may be intrinsically motivated to have enrolled on the programme and therefore may not require any motivation from the tutors. Nevertheless, motivation determines both activation and direction of every human behaviour and since every individual varies in the degree of intensity of their motivation, tutors need to motivate learns to meet their goals. Also, most of the learners may be experiencing frustration due to time constraints and other responsibilities and thus poor motivation can play a decisive role to dropout from the programme. Further, the findings revealed that 19 percent of the respondents have an intention to dropout of from school which could be attributed to lack of motivation from the tutors.
Second, per the nature of delivery mode of the distance programme, students are given the print-
material to study at home and only come into contact with the course tutor twice in a month. Having
gone through the module before coming for face-to-face tutorials, most of the students may not have
questions to ask in class. Also, the unwillingness of tutors to encourage students to ask questions in
class, may be due to the limited time assigned to courses during face-to-face tutorials. The inability of
tutors to motivate learners to learn can also be a factor for not encouraging learners to ask questions in
class. However, the overall findings revealed that the respondents had a positive perception towards
tutoring support provided by the University. This finding is in agreement with the findings of Alisha
(2016), Mustafa (2018), Segoe (2014) and Zhan et al. (2013), whose studies revealed a positive
perception of students with the services of their tutors. The findings also confirm Kiguwa and Silva
(2007) assertion that a tutor’s attitude towards students, is essential for academic success and helps
to keep students in school until graduation. This was evidenced when the majority of the respondents
are willing to remain in school because of their positive perception towards the tutor.

Further, the findings revealed a similarity with the findings of Segoe (2014) study where some
respondents believed their interpersonal communication needs were not met by tutors. Both the
findings of Segoe and that of this study revealed that, respondents were of the view that they needed
information, particularly on how to form study groups, as well as how to plan their own workload, which
were not provided by the tutors. All these could be attributed to lack of motivation from the tutors.

The second objective revealed that tutoring support is not statistically a significant predictor of
students’ retention in distance learning. This may be due to the interplay of different factors that
contribute to retention. An implication given by Mori (2015) was that, students’ retention was more
likely to be dependent on other factors and not only on tutoring support. The finding from this
research objective revealed inconsistent in the findings of Grillo and Leist (2013) and Segoe (2014),
where a significant relationship exists between tutoring support and students’ satisfaction to remain
in school. The inconsistency in the findings of these studies may be due to differences between
individual student characteristics and their educational culture. However, the finding of this study
is in agreement with that of Mori (2015) who did not obtain any statistically significant relationship
between tutoring support and students’ retention.

Finally, the finding of the study to some extent is consistent with that of Kostina (2011) which
revealed that autonomy, dialogue and satisfaction have significant correlation at the beginning and
the middle point of the course. However, the relationship among them significantly decreased towards
the end of the course. Moore (1983) believed that as the learner acquires expertise, the need for
structure decreases and autonomy increases, and this leads to learning pattern of behaviours that
are more constructivists. Participants in this study were in the second year of their study and they
have a positive perception of tutoring, it shows that there is at least no transaction distance between
them and the tutor. However, there are some implications from the present study for tutors who
provide tutoring support to students on distance learning.

Implications of the Findings to Tutors

Prediction of students’ retention in distance learning has several implications. The present findings
have student motivation implications. When motivation is applied to learning, it pushes the student
to try to expand his/her energy in a particular direction. Tutors who provide tutoring support to
distance learners need to motivate students to remain on the programme through encouragement
and also involving them in the teaching and learning process. The teaching and learning activities
should be more learner-centred. Beyond encouragement, the institution can offer periodic or yearly
seminars and workshops intended to increase students’ retention at the University to staff and students.

Conclusion
The findings of the study revealed that participants have positive perception towards tutoring support. However, the analysis of research objective two revealed that tutoring support is not a significant predictor of students’ retention in distance learning. It is important to note that, the original intentions of this investigation was to predict a relationship between tutoring support and students’ retention and not actual retention rates. Thus, although tutoring support was not a significant predictor of students’ retention in distance learning, the prediction of the model revealed that a unit increase in tutoring support will improve student retention by 1.42 times and the probability that a student who has a positive perception on tutoring support will stay on the programme is .83. The study concludes that management of the University should offer a periodic or yearly seminar and workshops intended to increase students’ retention at the University. Putting into consideration the benefits of students’ retention, a unit increase in any variable that can improve retention is commendable.

Limitations
Like other research, this study is not without a limitation. Its limitations are in two folds. First, the study was a predictive one and as such is impossible to generalise. Second, the logistic regression model did not give a 100 percent prediction. This means that there may be equally other important characteristics of the tutor that were not considered in this study. Other studies should therefore try to look at other characteristics of the tutor such as critical thinking and counselling skills.

References


Tutoring support as a predictor of student retention in distance learning


Harewood Cox, J. A. (2015). *Examining the perception of first year students on retention factors at the University of the West Indies*. (Doctoral thesis, University of West Indies, Mona). https://doi.org/10.18297/etd/2087


Papers are licensed under a Creative Commons Attribution 4.0 International License

Open and Distance Learner Engagement with Online Mediation Tools: An Activity Theory Analysis

Judy Corinne Noeline Pullenayegem, K. Radhika M. De Silva, & Buddhini Gayathri Jayatilleke
The Open University of Sri Lanka (Sri Lanka)

Abstract
This paper presents the results of a study conducted to ascertain the extent to which participants studying in an open and distance learning context utilized the mediation tools provided in an Advanced Writing Skills course, conducted in a blended-learning mode in Sri Lanka. Sixty-four participants engaged in the online component of the writing course using the Process Approach. The course consisted of seven sessions; four addressing the stages of the Process Approach to writing an essay, and three practice sessions. Data were gathered from log-files of the Learning Management System, questionnaires, and interviews related to five mediation tools provided to learners. The data were analyzed utilizing Engeström's activity theory framework (1987); with focus on the contradictions that emerged in the use of each tool. First, the contradictions that emerged in participants’ engagement with the tools is presented, secondly, the factors that need to be taken into account to ensure greater engagement.

Keywords: Mediation tools, Activity Theory, Contradictions, Open and Distance learning, Advanced writing skills, Blended-learning

Introduction
The use of technology in higher education provides learners with greater learning opportunities and flexibility. Availability of Information Technology (IT) has provided access to a wide range of online tools that give learners access to knowledge, as well as to learn through interaction with the community by utilizing given tools. Learning in the online environment is facilitated by many Learning Management Systems (LMSs) which enable instructors to create online courses, and facilitate communication between learner-learner, and learner-tutor. It enables learners to access the online learning resources provided, and to complete assignments. Studies related to online course delivery indicate that while the online tools provided to learners to facilitate learning have a positive impact on student learning, conflicts and contradictions can emerge as learners interact with the given tools, which can adversely affect learner engagement with these tools (Benson et al., 2008; Gedera, 2014). A widely used framework to analyse learner interaction, with given online mediation tools, that has helped identify areas of conflict and contradiction particularly in the online environment is Engeström’s (1987) Activity theory. This paper focuses on a study conducted in the Sri Lankan, Open and Distance Learning (ODL) context, studying English academic writing in a blended-learning course, at the Open University of Sri Lanka (OUSL). The study's findings of the extent of learner engagement with the online tools provided in the online course, and the difficulties that ensued in the interaction are presented.
Review of Literature

Mediation is a central concept of Sociocultural Theory (SCT) that draws on the ideas developed by Russian theorist Lev Vygotsky (1896-1934). Vygotsky argued that learning and cognitive development are interconnected, and that cognition develops through interaction with other members of a community; adults, peers, tutors, parents and others, and the social settings in which it takes place (Lantolf & Thorne, 2006, pp. 197-198). Thus, according to SCT human activity is purposeful and is carried out by actions using physical, cultural or psychological mediation tools (Vygotsky, 1978). Therefore, learning entails considering not just the individual learner, but also the learner’s social interactions, the artifacts or mediation tools employed in the interactions, and through the integration of these elements there is co-construction of knowledge. Physical tools can be anything from saws, hammers, paper, and pens, to computers which are externally oriented, whereas the symbolic or psychological tools such as language, icons, and art are internally oriented, and a combination of these types of tools mediate higher mental functions and human action (Vygotsky, 1977).

In teaching and learning English language using online mediation, a widely used LMS is the Modular Object-Oriented Dynamic Learning Environment (MOODLE) platform. This platform has several features or tools to facilitate online learning such as discussion forums (DFs), quizzes, the facility to integrate a wide range of learning resources which could be text-based documents, multimedia resources such as audio and video recordings, as well as features to upload assignments and journal entries. However, the availability of these tools within the LMS of itself does not guarantee that learners will interact with them to improve their English language writing skills (Suppasetseree & Nutprapha, 2010). Many studies have been carried out in conventional universities internationally, focusing on different areas in relation to online tools utilized in English language teaching in HE institutions (Birch & Volkov, 2007; Brine & Franken, 2006; Gedera, 2014; Mason, 2011; Murphy, 2004; Seethamraju, 2014; Yukselturk, 2010). In the Sri Lankan context there is dearth of studies in the conventional universities as well as in the ODL context. Therefore, this present study adds to the literature on this topic in the ODL context in Sri Lanka. This paper focuses on the findings in relation to the following two research questions:

- To what extent do the learners interact with the online mediation tools provided in the online component of the Advanced Writing Skills course to complete the given activities?
- What are the difficulties encountered by the learners in interacting with the online mediation tools?

Context of the study

This study is part of a larger project carried out with the learners in the Diploma in English Language and Literature Programme (DELL) of the OUSL in a Blended-learning mode, with both printed course material, and online mediation tools.

The sample, for this study consisted of 64 adults; learners of English as a second language (ESL) who followed the Advanced Writing Skills course, was made up of both females (47), and males (17). The home language of the majority was Sinhala, followed by English, and Tamil. The majority of participants were between the ages of 20 and 30 years, followed by those between 31 and 40 years, and 14 participants over the age of 41. Regarding occupation, the majority, 39 were teachers. Of these 24 were English language teachers. Those employed in administrative capacities, and students studying at other universities were 17, while 2 were homemakers and 6 were unemployed.
The *Advanced Writing Skills* course consisted of seven (7) Face-to-Face (F-2-F) sessions. Each session was for a period of three-hours, on one or two units of the *Advanced Writing Skills* Course Book pertaining to specific stages of the PA; pre-writing, drafting and revising, editing and proofreading, and sharing (publishing), and application of all the stages in writing 3 types of essay organizational patterns. Each day-school session had at least one take-home assignment that had to be submitted online within a week before the next F-2-F session. Participants were required to interact with each other online within the assigned group in order to promote peer learning through feedback and revising. The intervening period between classroom sessions also allowed participants to gain practice in aspects of writing they were instructed in at the previous classroom session/s. Participants could choose to interact with peers at any mutually convenient time throughout each 24 hour day within each intervening week. To facilitate writing practice in the online component of the course a number of online tools were provided in each session for learner interaction and engagement through the LMS (MOODLE). These tools consisted of discussion forums, quizzes, learning resources, assignments, and reflective journals.

**Methods**

A mixed methods research design (quantitative and qualitative) was used drawing on data from the LMS log-reports, questionnaires and interviews. Three (3) groups were formed with; 21 participants in the first, 20 in the second, and 23 in the third group. Analysis of the data in the online environment was conducted using Engeström’s (1987) Activity Theory (AT) framework with the primary focus on areas of contradiction. The term contradictions according to AT, is used to indicate a “misfit either within elements, between elements or between different activities … and are revealed through problems, ruptures, breakdowns or clashes” (Kuuti, 1996, p. 34). Thus, the use of the principle of contradictions in the analysis of the data in this study facilitates identifying the challenges and tensions encountered by learners in the activity system of this course in order to overcome these areas of tensions, and identify any changes necessary for the improvement and refinement of the course design. Figure 1 shows the basic structure of an activity system.
This paper will focus only on the analysis of the activity triangle Subject-Tool-Object (S-T-O) of the activity system of the Advanced Writing Skills course shown in Figure 2.

![Figure 2: Activity Triangle of Subject –Tools-Object (S-T-O).](image)

The **Subject** represents the learners of the Advanced Writing Skills course, who make up the sample for this study. The **Object**, the purpose of the activity, is to practice writing essays using the stages of the Process Approach (PA), to be able to achieve the desired outcome of developing competency in academic writing skills through the PA. The **Tools** are the mediation tools utilized to achieve the object of each activity outlined for each stage of the PA to essay writing. The **five tools** used were: 1) Learning Resources, 2) Discussion Forums, 3) Quizzes, 4) Assignments, and 5) Reflective Journals.

Information was extracted from viewing each participant’s “Activity Report” and “Forum Posts” in the log files in the LMS of the Advanced Writing Skills course. The results of the Log Reports were substantiated with the results of the questionnaires, and the interview findings, and Reflective Journal entries. Quantitative data were obtained from the pre-post questionnaires, and log reports of the online activities. Qualitative data were obtained from open-ended questions in the pre and post questionnaires, online forum posts and interviews. Triangulation was done by comparing and synthesizing the quantitative and the qualitative strands of the data.

**Results**

The data gathered from the Log Reports of the LMS regarding Subjects’ engagement with the online tools is presented in Table 1. The highest number of participants was recorded in Session 1, with a subsequent decrease in Sessions 2 and 3. Interaction with the quizzes registered the highest number of 39 participants; more than half the sample of 64 in Session 1. The lowest level of engagement with the tools was recorded in Sessions 4 in which learners were required to edit and proofread their drafts. A slight increase above Session 4 was noted in the Sessions 5 through to Session 7 that required writing three types of essays for final submission.
## Table 1: Overall results of Log Reports of interaction with mediation tools in S-T-O Activity Triangle

<table>
<thead>
<tr>
<th>Stages of the Process Approach</th>
<th>Application stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total No. of participants in study (n=64)</td>
<td>Sess. 5</td>
</tr>
<tr>
<td>Stage 1</td>
<td>Session 1</td>
</tr>
<tr>
<td>Stage 2&amp;3</td>
<td>Act. 1</td>
</tr>
<tr>
<td>Stage 4&amp;5</td>
<td>Sess. 5</td>
</tr>
<tr>
<td>Stage 6</td>
<td></td>
</tr>
<tr>
<td>Learning Resources</td>
<td>35</td>
</tr>
<tr>
<td>Discussion forum</td>
<td>26</td>
</tr>
<tr>
<td>Quizzes</td>
<td>39</td>
</tr>
<tr>
<td>Assignments</td>
<td>20</td>
</tr>
<tr>
<td>Reflective Journals</td>
<td>10</td>
</tr>
</tbody>
</table>

T. P. = Technical problem in LMS. N. R. = Not required. No. = Number of participants
To get further insight into participants' engagement with the mediation tools, the Log Reports were substantiated with results of the post questionnaire and post interviews.

Figure 3 shows the mediation tools provided to the participants, and their engagement with each tool according to the data gathered from the post questionnaire. The resource materials provided to facilitate teaching and learning in the Learning Resources (L.R.) tool are: L.R. 1) checklists, L.R. 2) tutorials, L.R. 3) videos, and L.R. 4) PPTs are presented. The interaction tools: Online discussion forums and Quizzes are presented separately. The Assignment tools: Assignments and Reflective Journals are also presented separately. The five (5) response variables used to determine the frequency of use of the tools are: never, rarely, sometimes, frequently, and always. These variables are represented in different colours with corresponding percentage results.

An analysis of the questionnaire results shows that of the tools provided, engagement with the Learning Resource tool was highest. Twenty-three (23) participants used PPTs, the next highest (15) used tutorials, which resources mostly consisted of lesson content, whilst a relatively lower number (10) used checklists, and (8) used videos. Further, these figures show that the greater number used the resources that required reading or viewing, but did not require writing.

With regard to interaction tools: Quizzes, and Online DFs; 21 (32.8%) participants never interacted with the quizzes, and 15 (23.4%) never interacted with DFs. This indicates that more than half the sample of 64 participants failed to interact with these two interaction tools. Regarding Assignment tools: Assignments, and Reflective Journals; 17 (26.6%) participants failed to submit Assignments, and more than half of the sample 33 (51.6%), did not make Reflective Journal entries. The aforementioned results enabled identifying the contradictions between and within the elements of the S-T-O.

The contradictions in the use of each of the 5 tools are next analyzed.

**Contradictions in use of Tool-1: Learning resources**

Contradictions emerged between the Subject and the Tool elements of the S-T-O activity triangle; the learners (Subjects’) and the Learning Resources (Tool). Tension arose due to the learners’ view
of the items provided in the Learning Resources. Though many items were provided in the Learning Resources (Checklists, Tutorials, Videos, PPTs); the participants did not view all of these as equally important. They selected those they deemed important; PPTs and Tutorials. Another conflict identified is that some of the learners were unfamiliar with the process in using the checklists, and experienced difficulties even though the process of using the checklists was explained and demonstrated at the F-2-F day school sessions. Additionally, a contributory factor which impinged significantly on their ability to utilize the items given in the Learning Resources mediation tool was time constraints. Comments pertaining to the contradictions are indicated in Table 2.

<table>
<thead>
<tr>
<th>Contradiction</th>
<th>Nature of contradiction</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject - Tool</td>
<td>Unfamiliar with process of using checklists</td>
<td>Commenting part [using checklists] given, I use that, but then little bit difficult not used to comment like that. We are doing that simple commenting. To think and to organize ourselves and write it was a bit difficult … [SF-6819-Interview]</td>
</tr>
</tbody>
</table>
|                               | Time constraints                                | I felt the resource that the tutor had already put was very, very, advanced and very good; only thing was it took a long time to read because there was lot of reading information there and self-reading and … I mean you need to have time, yeah, that was the thing which we were struggling, because to write alone for me it took one hour or one and a half hours, to construct my writing because before I type it, work on it separately in a Word document. [SF-4668-Interview]
|                               |                                                | I couldn’t use checklists, the challenge … time management … we have to arrange the time, and sit in [at] the computer… [SF-7863-Interview]
|                               |                                                | … late night, late night by that time I am also very tired so … my work is not good at that time, I work in the morning, thing is I have to do other things in the mornings, and I can’t get on at that time, so I have to get on late night sometimes it’s around 11 O clock. My case it’s a bit difficult. [SF-1807-Interview] |

Contradictions in use of Tool-2: Discussion Forums

The online DF is an important tool in the online course which facilitates peer interaction, feedback and supports learning, and sharing of knowledge as participants can view each other’s work. This forum also gives opportunity for the tutor/ researcher to monitor the activities and give feedback to the learners. The contradictions that emerged in the use of this tool were between the Subject and Tool.

The most significant contradiction between the learners (Subject) and the DFs (Tool) was poor learner engagement with the Tool. Though (64) Subjects were expected to engage in the 9 DFs of the 7 sessions of the online component, less than 50% did so. The interview comments revealed that the contradiction emerged due to weak peer participation. Another conflict that emerged between the Subjects and the DF Tool was related to limited computer competency. Some experienced difficulty in using the inbuilt drawing tools in the computer to complete the given activity such as...
drawing mind-maps and charts depicting narrowing down the essay topic. A further contradiction that emerged between the Subject and Tool was in editing and proofreading their work, limited English language proficiency was identified as the reason. Interview comments of participants related to the contradictions between the learners (Subject) and Discussion Forums (Tool) are presented in Table 3.

<table>
<thead>
<tr>
<th>Contradiction</th>
<th>Nature of contradiction</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject - Tool</td>
<td>Weak peer participation</td>
<td>Yeah, that was a bit difficult because once I finish … my paper then I would have to upload it, then getting someone’s feedback was difficult, because sometimes people in the group would not participate at all … that was a bit frustrating. [SF-3470-Interview] … I commented on all the member’s posts at first, nobody comments on mine so I thought I won’t comment also …SF-6623-Interview]</td>
</tr>
<tr>
<td></td>
<td>Limited computer competency</td>
<td>Uploading documents was very challenging, because we didn’t know. Several times I tried, I didn’t know drawing and entering and sometimes I do, then the, it’s, it’s, not there, something has happened to it. It has gone to another page, and I found it very difficult. [SF-5719-Interview] Basically I did it [uploading mind-maps and diagrams etc], but editing and putting it in that way, the arrows and all that, I found it difficult to search those things. I wrote it on my writing book, but to upload it was a difficult task for me. That was what I, kept me, keep me without doing it further. But if someone like helped me in that, I should have participated more in that. [SF-4878-Interview]</td>
</tr>
<tr>
<td></td>
<td>Limited language proficiency</td>
<td>You can do the brainstorming part, you can do the writing, the hardest part comes to editing and proofreading because you will have to assess your own writing. [SM-7320-Interview] … . . . editing] was something very hard because editing means editing our own, our own work was a little difficult because we need to realize what we have written is wrong to find that is a little difficult that was very hard [SF-4668-Interview]</td>
</tr>
</tbody>
</table>

**Contradiction in use of Tool 3- Quizzes**

Two contradictions emerged as respects the quiz feature: (1) within the mediation tool element, (2) between the Subject and Tool element.
The contradiction within the mediation tool (Quizzes) emerged due to a technical defect encountered in the inbuilt quiz design feature of the LMS. This necessitated using the “Hot Potatoes” quiz authoring program instead, as well as re-designing the quiz. The breakdown in the operation of the quiz feature revealed a further tension within the tool element. The previous quizzes only required Subjects to click on the correct button to answer a quiz and receive automated feedback. However, the re-designed quiz required written responses, which revealed a further contradiction between the Subjects and the Quiz Tool elements. Despite engagement with quizzes having the highest number of participants (39) in Session 1, when compared to all 7 Sessions, participant levels subsequently decreased significantly. The majority of Subjects manifested a noticeable reluctance to express themselves in writing, and preferred the easier task of clicking the correct button. Participants’ comments are presented in Table 4.

Table 4: Contradiction in use of Tool 3- Quizzes

<table>
<thead>
<tr>
<th>Contradiction</th>
<th>Nature of contradiction</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within Tool</td>
<td>Dysfunction of Quiz Feature in the LMS</td>
<td>I feel that I did not benefit so much, I feel that the quizzes, can err… be improved or moderated then it would be automatically corrected [SF-3673-Interview]</td>
</tr>
<tr>
<td>Subject-Tool</td>
<td>Reluctance to express themselves in writing</td>
<td>Quizzes, I think you can add more questions, that’s easier without doing paper work there, 8 questions and radio buttons to mark the question then it’s easy not very time consuming [SM-5439-Interview]</td>
</tr>
</tbody>
</table>

Contradiction in use of Tool 4 – Assignments

At the end of each session the participants had to upload a revised copy of their assignments, based on peer feedback, into the Assignment Drop Box to be tutor marked. Finally, on receiving tutor feedback the assignment had to be re-revised, and sent to the Final Copy Forum to be shared with peers and tutor. Contradictions emerged between (1) Subject and Object, and (2) between Subject and Tool elements of the S-T-O activity triangle in this stage.

The contradiction that emerged between (1) Subject and Object elements in the S-T-O activity triangle was due to inadequate language proficiency resulting in low participation. The highest interactions with the Assignment Tool were recorded in the activities in Session 1; the initial part of the pre-writing stage, which were less demanding. The lowest engagements were in Stage 5; that required editing and proofreading. This was also observed in Sessions 5, 6, and 7 of the Application Stage. The interview comments revealed that the contradiction emerged as a result of some participants finding it difficult to meet the assignment’s requirements, due to limited English language writing skills. The Assignment Tool required the learners to engage in all stages of the PA, which included editing and proofreading their assignments prior to sending them for tutor feedback. However, this was a challenge for some learners, and was highlighted at the interviews.
Additionally, tension was observed in the elements of (2) Subject and Tool due to a lack of rewards or marks being allocated for the assignments, resulting in a lack of motivation to engage with the Assignment Tool. This too was highlighted by the learners at the interviews.

Sample interview responses are presented in Table 5.

Table 5: Contradiction in use of Tool 4 – Assignments

<table>
<thead>
<tr>
<th>Contradiction</th>
<th>Nature of contradiction</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject-Tool</td>
<td>Low engagement due to lack of motivation</td>
<td>When we were doing the class, we dint take it that seriously, but after coming all the way at the very end we feel like, all are friends, we used to talk, we should have done it more, we all ways say Madam pushed us so much and you know if we had done more it would have been helpful for us, because there were lot of assignments, we were given lot of time to do so, yeah, on our part we didn’t do all the assignments. I of course tried to do the most, yeah, … but there were lot of friends, but they didn’t do much if we have done that or what was given there. Would have been immensely helpful SF-6623-Interview] If marks given for assignments, then of course, I have to be very honest, then of course ...if you say like: ok, if you are an active participant online, then I am going to give you the marks in the class, then of course all of us would try, that is I would say a personal influence [SF-3729-Interview]</td>
</tr>
<tr>
<td>Subject-Object</td>
<td>Inadequate language skills</td>
<td>I try to correct, sometimes, I couldn’t, I don’t have idea about how to correct mistakes [SF-2643-Interview] Actually, the thing is editing is the most difficult part and ... very difficult that use correct academic and very correct form of the grammar, we can write, but academic form, academic form, we should I think we should do it ourself [sic], but the editing re-checking, editing rechecking, that is very important [SF-7471-Interview].</td>
</tr>
</tbody>
</table>

Contradictions in use of Tool 5- Reflective Journal

The final assignment required participants to write a reflective journal entry after each session on a Word document and upload it to the Reflective Journal Forum.

The most noteworthy contradiction in the use of the Reflective Journal was between the Subject and Tool (Table 6). Engagement with this tool in the 7 sessions was low; lower than all other mediation tools. The highest number (10) participants engaged with this Tool in Session 1. Thereafter, engagement levels in journal entries decreased to 5 participants in Sessions 2 and 3, and subsequently to 1 participant in the application stage.
<table>
<thead>
<tr>
<th>Contradiction</th>
<th>Nature of contradiction</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject-Tool</td>
<td>Low engagement due to lack of motivation</td>
<td>The thing is this, now we have the result, thereafter no personal encouragement to do something, the later part you mention something, now your assignment is ok! Very good! Well done! Something like that, then we have no idea to do that part [writing reflective journals] [SM-2947-Interview] I think even, I hadn’t done all reflective journals online, because like I said, maybe we didn’t want to sit and do that, I am just giving my opinion [SF-1620-Interview]</td>
</tr>
</tbody>
</table>

**Discussion**

The analysis of extent of engagement with the online mediation tools reveals that learner engagement was low with all 5 mediation tools in the activity triangle of the S-T-O. The primary contradictions that emerged were evident between the Subject (Learner) and all 5 mediation Tools. In the use of Tool 4 (Assignments) contradictions emerged between the Subject (Learner) and Object. Also, contradictions were observed within the Tool element in the use of Tool 3 (Quizzes). Among the most noteworthy contributory factors for these contradictions were; lack of motivation, time constraints, as well as limited language proficiency. Other contributory factors were; technical issues and limited computer competency.

**Motivation**

The quantitative and qualitative findings show that both external and internal aspects of motivation contributed to the tension in the (S-T-O) activity triangle of the activity system. External factors adversely affected both interaction and engagement in the assigned activities, as well as feedback which was ascertained from the log file reports, and confirmed by the interview responses. The interview responses reveal that the two primary reasons were the lack of incentives because no marks were allocated for engagement with the tools, and the other was that engagement was not compulsory. A similar lack of incentive was noted in other studies (Aduayi-Akue et al., 2017; Aziz, 2003; Fung, 2004; Hin, 2011). Conversely, studies conducted by Nandi et al. (2011), attributed greater participation in the DFs because marks were awarded.

In considering the internal aspects of motivation that contributed to the tension in the activity triangle, it was observed that most participants failed to recognize the intrinsic value of the tools provided. These results show that external and internal motivation is vital to ensure greater participation in course activities.
Time constraints

Time constraints due to personal and institutional factors impinged on the level of engagement with the tools. This was observed within and between Subject-Tool. These results were endorsed by the interview responses. Time constraints due to personal factors were because the majority of participants were adult learners, and the majority 56 was employed with secular and domestic commitments. Balancing these multiple roles along with their studies was challenging (Quimbly & O’Brien, 2004, Topham, 2015). These commitments impinged on the level of participation because time was required to think about what to say in order to contribute meaningfully to online DFs. The results revealed that only around 50% of the total sample participated in the online DFs. The highest number of participants was in the first session because the activities in this session were less demanding of their time. Thereafter, the number who participated decreased in the subsequent sessions because more time was required to complete the given activities.

Additionally, personal circumstances of ESL learners, who are adults with secular, domestic and other commitments including studying other subjects, experience difficulty completing course work (De Silva & Devendra, 2015; Vidanapathirana, 2006; Vidanapathirana & Gamini, 2009).

English language proficiency

Disparate English language proficiency contributed to contradictions in the activity triangle (S-T-O). The findings revealed a close interrelationship between interaction, feedback and motivation; one can cause a reaction in another and vice versa. The interview responses confirmed these results. The findings also show that there was a significant relationship between language proficiency and online interaction, as endorsed in the study conducted by Leung (2013). In the present research, participants who were less proficient in the English language engaged minimally in the assigned activities using the mediation tools. This was especially evident in the Editing and Proofreading session which required higher English proficiency. This resulted in reduced feedback on peer submissions. These results corroborate with the findings by Jayatilleke and Gunawardena (2016) in their study on online learning and cross-cultural e-mentoring, which revealed that the participants with limited linguistic proficiency participated less, and therefore suggested that this limitation of these ESL learners be taken into consideration when designing online activities.

Technology

Technological issues contributed to the level of interaction between the participants (Subject) and (Tools) in the (S-T-O) activity triangle. Tensions within the (Tool) element were evident due to a breakdown in the quiz feature of the LMS. The analysis of the log reports in the LMS revealed that the tool most utilized by participants was the quiz feature. The reasons for this were provided in the interview responses which showed that it was convenient, gave them instant feedback, included a score, and did not involve much written work. However, due to dysfunction of this tool, the participation was adversely impacted. Gedera and Williams (2016) study also reported learner frustration and tension when experiencing difficulty in downloading podcasts. The results of the present research also revealed that technology plays a significant role in maintaining student interest and technological failures can de-motivate learners.
Pedagogy

The findings show that contradictions related to pedagogy were present in the activity triangle (S-T-O). The contradiction between the participants (subjects) and the (Tool) was due to a breakdown in the quiz feature and dissatisfaction with the re-designed alternate quiz. The findings in the log reports is confirmed by the interview responses that showed that participants were dissatisfied with the alternate quiz design, which was deemed to be time consuming. This draws attention to the importance of designing learning activities and providing mediation tools such as quizzes that would sustain engagement (Jeffrey et al., 2014).

The findings of this research show that the learners used a variety of mediating artifacts (tools) that were specially designed for the course to help in their writing processes. These included the online Learning Resources tool, which had a variety of learning materials such as checklists, PPTs, Tutorials, and videos, as well as four other tools: DFs, online quizzes, assignments, and reflective journals. While the learners used these mediation tools, some did so to a greater extent than others. However, at the commencement of the course the importance of these tools and reasons for using them was not sufficiently impressed on them. Thus, facilitators and tutors could, before the commencement of future courses, make the learners aware of the importance of these resources as a means of improving their writing skills, which might also serve to increase learner engagement with these tools and thereby improve their writing skills.

Also the findings of the present research revealed that the learner engagement in the quizzes integrated into the online component was high, until the breakdown of the quiz feature of the LMS. Therefore, the online teacher could include an interesting variety of quizzes into the quiz feature of the LMS to stimulate and sustain learner interest. Quizzes that require less writing, are not time consuming, and provide instant feedback with a score, that will sustain learner interest (Aziz, 2003).

The institutional implication that surfaced in this research is related to technology and plays a significant role in learner engagement. A technological concern that surfaced in the research was related to the dysfunction in the quiz feature of the LMS, which de-motivated learners. Other researchers also confirm that this is a challenge facing DE institutions that have adopted online learning (Mahlangu, 2018; El Mansour & Mupinga, 2007). This finding shows that HE institutions which have adopted online learning will need to take into consideration learner de-motivation and set in place mechanisms to address technology related issues promptly.

Conclusion

The results of this study reveal that although the mediation tools were provided to enhance academic writing, these tools were under-utilized by participants. The most significant contradictions emerged between the learners (Subject) and the mediation (Tools). The noteworthy contributory factors for the contradictions were time constraints, a lack of motivation, and disparate language proficiency. The personal circumstances of the ODL learners, who are adults with secular, domestic and other commitments, impinged significantly in engagement with the given tools. However, as suggested by the learners, if incentives were offered, such as the allocation of marks, it would have prompted them to greater engagement. De-motivation and technology related issues need to be given due consideration by HE institutions by setting in place appropriate mechanisms. As Foot (2001) explained, through identification of contradictions in the Activity Theory, it was possible to gain illumination into areas that need to be given attention to, and changed as well as developed in the design of the course to enable greater learner engagement.
References


The Influence of Social Presence on Students’ Satisfaction toward Online Course

M. Khalid M. Nasir
Universiti Kebangsaan Malaysia (UKM) (Malaysia)
mdkhalid@ukm.edu.my

Abstract

Students' satisfaction plays a vital role in ensuring effective online learning. This study investigated the association between social presence and students' satisfaction toward online discussions in Learning Management System (LMS) platform conducted at a private university in Malaysia. Both correlation and two-step hierarchical linear regression were performed to analyze the online survey data. The instruments used to measure the summated scores of social presence and satisfaction were Community of Inquiry (CoI) framework and satisfaction scale, respectively. The results revealed that the correlation between both variables was significantly positive. Students who declared relatively high level of satisfaction were more likely to report high level of interaction with their peers in online conversation and high level of social presence. Essentially, social presence seemed to contribute the most in predicting the level of course satisfaction amongst the students.

Keywords: social presence, course satisfaction, online learning, Community of Inquiry (CoI)

Introduction

Online learning is rising in popularity amongst adult learners who are unable to attend face-to-face courses due to geographical, career, and other circumstances. This escalating demand has garnered the attention of higher education institutions worldwide to offer a new approach of virtual teaching and learning. For instance, more than six million students in the US had enrolled in at least one online course in 2015 (Allen & Seaman, 2017). This number represents about 4% of overall course enrolment and slightly higher when compared to the enrolment figures recorded for years 2015 and 2016. Upon synthesizing plenty of research work and publications over a 10-year period on transnational distance students, Stewart (2019) found a rapid demand for online learning worldwide, including multi-mode programs of study, such as overseas/offshore branch campus, franchise, credit validation, dual degree programs, twinning, double degree with mobility, joint degrees, and consecutive degrees fully conducted via online or hybrid mode.

In light of online education across Asian countries, the demand in Korea (Yu & Richardson, 2015) and China (Feng et al., 2017) was reported to rise gradually. Similarly, Malaysia has been offering a range of online courses to meet learners' demand. This endeavor is in line with the 21st century education and parallel to the fourth industrial revolution outlined in the Malaysia Government Transformation Plan (Malaysian Ministry of Higher Education [MMOHE], 2017). Regardless of synchronous or asynchronous, fully or hybrid approach of online courses, these courses have been designed to cater to students' learning needs. The virtual environment found in online learning offers learning experience in a real lecture room or hall despite geographical circumstances, thus attracting both participation and interest of students. Despite the efficacy of an online learning portal, a significant drawback has been linked with the tendency of isolation and course drop-out if the students deny active learning engagement.
This issue had been pointed out by many researchers while discussing several vital aspects that demand attention to assure the attainment of learning objectives outlined for an online course or program, apart from ensuring high-level satisfaction amidst students. Meanwhile, a number of studies reported on the efficacy of online courses or programs with doubtful issues lurking. A list of issues, including withdrawal, loneliness, boredom, and dissatisfaction, has been identified to affect the quality of online courses (Bowers & Kumar, 2015; Tirrell & Quick, 2012). Social interaction among students, which has been identified as social presence (Garrison et al., 1999; Moore, 1989; Rovai & Downey, 2010; Spiro, 2011), is an essential element that sustains the efficacy of virtual learning approach. Social presence reflects one’s ability to interact with others virtually (Garrison et al., 1999; Moore, 1989). It serves as a predictor and has been linked with course satisfaction (Baharudin et al., 2018; Hostetter & Busch, 2006; Shin & Kang, 2015). Short et al. (1976) asserted that the theory of social presence upholds the significant correlation between learning and its effects on technology. Other studies (see Alman et al., 2012; Garrison et al., 1999; Moore, 1989; Taghizadeh & Vaezi, 2011) reported that peer participation in a virtual learning environment has a crucial role in ensuring that the virtual activities can occur within student-student communication. A substantial challenge in synchronous interaction is that feeling, perception, and reaction cannot be excluded from the conversation (Tu & McIsaac, 2002) either in live lecture or in presentation (Çakiroğlu, 2019), in comparison to asynchronous discussion where students can engage with each other at any time and at their own pace.

Çakiroğlu (2019) discovered that social interaction, comfort, view acknowledgement, and sense of collaboration among 47 students during live discussion were below satisfactory level. The outcome denoted that maintaining engagement among students was a challenge in live discussion session. Besides, social presence was not significantly related to academic achievement, which is in disagreement with that reported by Kara et al. (2019). This insignificance portrayed that the engagement of students in learning did not affect their grade unless marks were allocated for the effort of students in communicating via learning portal. In other words, this is an alternative to encourage students’ engagement by making it compulsory in the course requirement for them to log in and actively engage in the virtual learning environment. Other researchers highlighted that social presence may be triggered through asynchronous communication, such as via text, recorded video, and note (Garrison et al., 1999; 2010b), which dismisses ultra-speed Internet connection, audio, and video. Students can simply download or view the learning material at their convenience, as not all could afford a live web conferencing due to mobile data and bandwidth limitations.

Turning to this study, social presence was adopted from the definition stipulated in the Community of Inquiry (CoI) framework coined by Garrison et al. (2010a). The framework is comprised of affective expression, open communication, and group cohesion that are likely to occur in online discussion within the Learning Management System (LMS) platform. Social presence may be influenced by demographic characteristics differences, course content and technology, instructional strategies, as well as students’ personalities and learning styles (Cobb, 2011; Hostetter & Busch, 2006; Spears, 2012). Another crucial aspect that demands exploration is students’ satisfaction towards the online courses that they enrolled. Satisfaction has a significant impact on social presence, besides functioning as a key component in sustaining the quality of online course (Howell & Buck, 2012; Swan, 2001). For instance, poor feedback from instructors and peers, as well as the feeling of uneasiness and discomfort in communicating in an unknown virtual group members, could lead to dissatisfaction towards the course (Richardson et al., 2012; Swan et al., 2008).

Apart from social presence, another integral variable is age (Alman et al., 2012; Bulu, 2012; Croxton, 2014) that was investigated in a constant comparative analysis that involved 36 articles
published based on the themes of open and distance education, instructional technology, and adult education. The analysis revealed a range of factors, including age, gender, knowledge, and skills, which highly influenced the success of online learning. Courses enrolled and completed (Cobb, 2011; Hostetter & Busch, 2013; Spears, 2012) also contributed to the level of satisfaction towards online course. As outlined by Kara et al. (2019), the three internal challenges faced by adult learners in online learning are management, learning, and technical. Meanwhile, the two external challenges of job-related and domestic had an impact on the satisfaction level towards online learning. Despite the rapid increase of online courses in Korea, Choi and Kim (2018) found that a large number of drop-out of online courses at Cyber-University Degree Programs was due to scholastic aptitude, unclear learning objectives, physical constraints, lack of cognitive presence, lack of teaching presence, dissatisfaction, and issues in academic achievement. This is corroborated by De Paepe et al. (2018), as they reported that high cases of drop-out stemmed from ineffective interaction, mainly because interaction is a key element in predicting students’ satisfaction. This concern had gained attention from instructional designers, policy makers, and educators.

Since only a handful of studies have probed into this area especially on the connection between social presence and several demographic variables, more studies are required to explore this field (Khalid & Quick, 2016). As such, this study assessed the issues of demographic and social presence in light of students’ satisfaction level towards online course. This purpose is in line with the aims stipulated in the Malaysia Critical Agenda Project, the National e-Learning Policy, the Malaysia Government Transformation Plan (MMOHE, 2017), and the demands of 21st century education in the era of fourth industrial revolution where education is a non-stop process and should be more open. Additionally, this study provides guidance for online instructors and learners to improve the quality of online interaction and to establish more engagement, so as to gradually reduce the rate of drop-outs among online learners (Bowers & Kumar, 2015).

**Method**

The total sampling frame of this study was 3000 online students from a private university in Malaysia. They were selected quantitatively from 50 learning centers nationwide and currently enrolled in online courses in a semester. An online cross-sectional survey was administered using convenient sampling. Data were collected within the duration of three to four weeks through Qualtric web survey service provider. In order to guide, interpret, and analyze the retrieved data, the CoI survey was adopted to measure social presence with nine items using social presence sub-scales, namely affective expression, open communication, and group cohesion. The social presence construct has been verified as a reliable and validated measure (Garrison et al., 2010a, 2010b; Yu & Richardson, 2015; Zimmerman & Nimon, 2017) and used for more than a decade to measure presence.

Next, the construct of course satisfaction was embedded in the survey with five items established on six-point scale. The validity and reliability of this survey has been approved by many researchers in the field (Lee et al., 2011) as it measures several aspects of course satisfaction, such as goal, content, recommendation, discussion, and overall satisfaction. The online survey link was emailed to all selected sample in this study by a gatekeeper with three reminders via email. The raw data gathered in the Microsoft Excel format was exported to SPSS software in order to perform inferential statistics. The research questions were answered by performing correlation and two-step hierarchical linear regression after addressing missing information, outliers, equality of variances, and normality of data.
Results

Out of the 3000 Qualtric links sent to the respondents via email, only 73 had completed the link; indicating 2.4% response rate. According to Ho et al. (2013) and Nulty (2008), the 2.4% response rate falls within the acceptable range of online survey even though the literature depicts that it is difficult to capture high response rate, when compared to traditional survey. Nulty (2008) asserted that the required response rate for the sample size of this study is 750-2000, with 1-3% response rate being adequate. Theoretically, if the sample size is 2000 or more, the response rate should be less. This justifies the accepted response rate for online survey, as opposed to conventional and paper surveys. Although the response rate for this study is low, it is sufficient and accepted for data analysis.

The descriptive results revealed that 62% of the respondents were female. More than 90% of the respondents were part-time students and enrolled in the hybrid mode of study. Nearly 54% of the respondents were 22-35 years old. Meanwhile, 46.5% of the respondents had experienced online learning prior to enrolling the current course and almost 70.0% claimed that the course was compulsory for their major. The Cronbach’s Alpha (α) values for social presence and course satisfaction are .86 (mean=3.73) and .94 (mean=4.63), respectively. The reliability for social presence sub-scales is as follows: affective expression is .62 (mean=3.70), open communication is .82 (mean=3.78), and group cohesion was .79 (mean=3.72).

The assumptions of linearity and normality were fulfilled. Social presence was significantly correlated with course satisfaction, \( r(71) = 0.64, p < 0.001 \). These constructs displayed a strong and positive correlation with large effect size (Cohen, 1988), and followed by age that was also significantly correlated with course satisfaction, \( r(71) = 0.31, p < 0.001 \). Age portrayed the weakest positive correlation with medium effect size (Cohen, 1988). Nevertheless, the number of completed online courses did not display any statistical correlation with course satisfaction.

Two-step hierarchical linear regression was performed to examine if social presence predicted course satisfaction. Both leverage statistics and Cook’s distance revealed that several respondents could possibly be outliers. Based on closer analysis, the two-step hierarchical linear regression was recomputed. In the first step, only age had significantly predicted course satisfaction, \( F(6, 67) = 3.35, p < 0.024 \). However, \( R^2 = 0.09 \) (\( R^2 = .13 \)) when age, number of prior courses taken, and number of courses completed were incorporated into the model. Nonetheless, as indicated by the adjusted \( R^2 \), only 9% of variance in course satisfaction was predicted after identifying the students’ age, the number of prior courses taken, and the number of courses completed. In the second step, three variables displayed improvement on the prediction with \( R^2 = 0.35, F(1, 66) = 44.59, p <0.001 \). Upon embedding social presence to the model, the number of prior courses taken by the students turned into an insignificant predictor, as tabulated in Table 1.

The entire group of variables significantly predicted course satisfaction, \( F(4, 66) = 34.98, p < 0.001 \), adjusted \( R^2 = 0.66 \) (\( R^2 = 0.68 \)). This means; 66% of variance in course satisfaction was explained by the model and the remaining 34% was explained by unidentified factor(s). This appears to be a substantial effect, as depicted by (Cohen, 1988). The beta weights and the significance values presented in Table 1 indicate the variable(s) that contributed the most in predicting course satisfaction. Number of prior courses taken, number of courses completed, and age were affected marginally in the equation and were retained. Upon retaining these predictors, social presence allocated the highest beta (.60), followed by age (.24), and number of courses completed (.19), which contributed significantly to predicting course satisfaction. In sum, the hierarchical linear regression model for course satisfaction is as follows:
The Influence of Social Presence on Students' Satisfaction toward Online Course

Course Satisfaction = -.64 + (1.12 social presence) + (.02 age) + (.12 number of course completed) + (-.02 number of prior courses taken)

Table 1: Summary of Hierarchical Multiple Regression Analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>(\beta)</th>
<th>(R^2)</th>
<th>(\Delta R^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.03</td>
<td>0.01</td>
<td>0.36*</td>
<td>0.13</td>
<td>0.13</td>
</tr>
<tr>
<td>Num. of Prior Courses</td>
<td>-0.02</td>
<td>0.03</td>
<td>-0.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Num. of Courses Completed</td>
<td>0.11</td>
<td>0.07</td>
<td>0.18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>3.18</td>
<td>0.53</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
<td>0.48</td>
<td>0.35</td>
</tr>
<tr>
<td>Age</td>
<td>0.02</td>
<td>0.01</td>
<td>0.24*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Num. of Prior Courses</td>
<td>-0.02</td>
<td>0.02</td>
<td>-0.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Num. of Courses Completed</td>
<td>0.12</td>
<td>0.06</td>
<td>0.19*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Presence</td>
<td>1.12</td>
<td>0.17</td>
<td>0.60**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-0.64</td>
<td>0.70</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. *\(p<0.05\), **\(p<0.01\)

Conclusion

This study revealed a positive relationship between social presence and course satisfaction in an online course. This means; students with high level of social presence were more likely to possess a high level of course satisfaction. The result is consistent with many other studies (see Alman et al., 2012; Baharudin et al., 2018; Bulu, 2012; Cobb, 2011; Croxton, 2014; Spears, 2012). This concludes that affective expression, open communication, and group cohesion, which are embedded in the theory of social presence as investigated by Garrison et al. (1999), are significant to enhance the quality of relationship with peers in an online learning environment, besides discovering these three components in a different setting. Social presence is integral to sustain engagement and satisfaction. This finding justified that social presence in the CoI framework is strongly correlated with course satisfaction, exclusively among Malaysian online students. Thus, social presence significantly contributes to the success or failure of e-learning.

Another important finding found in this study is that age contributes to course satisfaction. Students at 22-35 years old exhibited a significant contribution factor. Knowles et al. (2015) considered this range of age as the age of adult learners, in which they are more independent, their learning styles are self-directed, and they take responsibility for their decisions. Hence, online learning instructors should reduce the pedagogical approach, but instead, concentrate more on andragogy method to accommodate to their learning styles. In other words, only uploading learning material to the LMS platform seems inadequate. Online discussion should be further enhanced with multiple techniques of questioning in the forum to ensure that the course learning objectives can be achieved.
successfully. According to World (2020), eight questioning tips may be applied in online discussion to improve students' engagement. The eight questioning tips are as follows: construct with clarity, provide hints with caution, beware of falling into one's trap, vary the question bank, question based on the course type, appropriate sequence of questions, striking the right balance, and creating "deliberate distractions". Feedback from online learning instructors should be in timely manner to encourage other students to engage in the conversation. The LMS is not a bank of learning materials and the instructors should comply to the Sharable Content Object Reference Model (SCORM) standard that does not place heavy emphasis on pedagogical aspect (Rustici Software, 2016). As a result, the aforementioned issues of isolation, loneliness, boredom, dissatisfaction, and withdrawal of courses (Bowers & Kumar, 2015; Tirrell & Quick, 2012) may eventually be hindered.

Another contributing factor identified in this study refers to experience and prior knowledge of online learning environment. The number of completed courses significantly contributed to predicting course satisfaction. This means; the more online courses completed by students, the more satisfied they feel, when compared to those who just enroll in the online course for the first time. Therefore, online learning instructors should be aware of and identify both students’ familiarity and comfortability toward the LMS components, apart from providing technical support. The social presence embedded in the CoI framework emerged as a vital element that could clearly affect course satisfaction among Malaysian students. Thus, social presence may serve as a yardstick for other universities in Malaysia, so as to ensure that their LMS platform is sufficiently capable in dealing with effective peer interaction regardless of the type of learning platform used - proprietary or open source. The efficacy of online pedagogy, as envisioned in the National e-Learning Policy, demands enhancement to upgrade the quality of online learning courses (MMOHE, 2017).

Social presence may be explored from other various angles, including category of courses, sample, type of LMS (proprietary, open source, customize or self-develop), and learning styles (Lacey & Lawson, 2013). The new findings offer a meaningful and insightful discovery as Malaysia is currently lacking of evidence in supporting the success of e-learning in local context (Hamat et al., 2010). Simultaneously, the findings reported in this study support a Key Result Area in the Malaysia Critical Agenda Project (MMOHE, 2017), which is to improve e-learning to be a more meaningful experience, especially across LMS platforms. Another massive challenge found in online learning refers to poor peer interaction that may be affected by cost of internet data packages, family status, type of residence, and location. These demographic factors should be weighed in by the stakeholders; the Ministry of Education, university, and students who have spent plenty of resources and money for online learning. These stakeholders should devise alternative plans to ascertain that online education can be participated equally by those dwelling in rural area and other underprivileged groups.

References


Sears, L. R. (2012). Social Presence, Social Interaction, Collaborative Learning, and Satisfaction in Online and Face-to-Face Courses (Graduate Theses and Dissertations. 12976.) Iowa State University. Retrieved from https://lib.dr.iastate.edu/etd/12976


Evaluation and Improvement of students’ satisfaction in Online learning during COVID-19

Fayyaz Ahmad Faize & Muhammad Nawaz
COMSATS University Islamabad (Pakistan)
drfayyaz@comsats.edu.pk & muhammad.nawaz@comsats.edu.pk

Abstract
With the closure of educational institutions due to COVID-19, the biggest challenge with the universities and the instructors was engaging students in virtual learning. This research aimed at supporting university students in Islamabad (Pakistan) for online learning through a collaborative approach. The university started online learning during COVID-19 and had no earlier experience of such mode of learning. The first phase was identifying the problems faced by students during online learning and seeking their suggestions for overcoming them. The next step was working on the students’ opinions with a team of instructors to modify existing instructional practices during online instruction. We measured students’ satisfaction level pre and post-modification to evaluate students’ adoption of online learning. The data for both the phases were collected through a Google Form. The post-modification data revealed students’ greater satisfaction in online learning. The findings offer useful insight related to students’ adoption of online learning and making it a more meaningful, organized, and productive medium for future learning.

Keywords: COVID-19, online learning, virtual learning, satisfaction, university students, instruction

Introduction
COVID-19 stands for Corona Virus Disease 2019 (Zhong et al. 2020), which appeared as common pneumonia in December 2019 in Wuhan, China (Huang et al., 2020)). When the virus spread to other countries, the World Health Organization termed it a pandemic (WHO, 2020). The first case of COVID-19 appeared in late February 2020 in Pakistan, the neighboring country with China. The government announced the closure of educational institutions to prevent its spread. In the meantime, the ministry of education issued instructions for online learning to compensate for the educational loss. As a result, the educational institutions switched from offline to online learning (Dhawan, 2020). Teachers with no prior experience of online education started online instruction (Wang, Zhang et al., 2020). With this, the world witnessed the most massive live experiment of switching from formal to online education in human history (Jones & Sharma, 2020).

Online learning refers to learning experienced in synchronous or asynchronous environments using the internet, where students interact with instructors and fellow students from anywhere (Singh & Thurman, 2019). Based on this definition, many arguments are given in support of online learning. Some of these include being accessible, affordable, and flexible. The learners can attend online classes from anywhere. It is economical, and the learners can schedule learning as per their convenience (Dhawan, 2020).

In the wake of COVID-19, online learning is no longer an option with educational institutions; instead, there is no other option without it. The educational institutions accepted the need for digitizing their operations and initiated arrangements for digital learning (Dhawan, 2020). One can anticipate a significant shift in the instruction and learning styles due to the intensive use of technological tools and platforms. During this transformation, Carey (2020) reported that ensuring the quality of instruction and learning is not essential; instead, switching to online learning by educational institutions needs
appreciation. However, a massive transformation to online learning without ensuring quality will be ineffective. Almost more than half of the enrolled students in online programs quit due to dissatisfaction with the education quality (Betts, 2009). For this reason, Roach and Lemasters (2006) emphasized that there will always be a need to explore students’ satisfaction with online learning.

While the educational institutions switched to online instruction, the instructors and learners both resisted due to technological complexities. This research investigates the transition from formal to virtual learning in Pakistan, a developing country with the sixth-largest world population (Ahmed & Mohamad, 2011). Reaching online to a large body of students was a big challenge for educational institutions. The Higher Education Commission (HEC) of Pakistan (a statutory authority regulating the working of universities) issued directions to all the universities to start online classes. The universities asked the instructors to use any platforms such as WhatsApp, Google classroom, Zoom, Microsoft Teams, or any other to teach online.

Online learning is useful for students having the necessary resources and technological skills (Brown, 2019). However, it is challenging for others with limited technical knowledge and a lack of resources (Owusu-Fordjour et al., 2020). Online sessions bring a variety of technical problems such as login issues, low audio, and video quality, and downloading errors (Dhawan, 2020). Students feel depressed when they face such technical problems (Kim et al., 2005).

In contrast, students do not face such technical problems in formal classroom settings. In research by Abdelaziz et al. (2011), on comparing the effectiveness of online learning versus classroom learning, the nursing students reported satisfaction with online learning. However, they did not prefer to continue with such mode. The lack of technical skills prevented students’ interaction with the instructor and participation in the online discussion. The students preferred recorded lectures over live online lectures. The students suggested the availability of required resources such as computers and the internet necessary for online learning. The authors recommended blended learning that integrates e-learning and the formal classroom experience.

Kim et al. (2005), in their research, found the university students highly satisfied with online learning. The students acknowledged the benefit of online learning and liked its flexibility. They suggested continuous practice with using technology and training in virtual teaming skills. However, the students reported difficulty in interacting with their peers and instructors during online learning besides delayed feedback. Dhawan (2020) also mentioned online learning unengaging due to a lack of personal attention and interaction.

Agarwal and Kaushik (2020) investigated medical students’ perception of online learning during the 2020 lockdown. They used the Zoom platform for online instruction for 12 days. The participants expressed their satisfaction with online education and viewed it relevant to their learning needs. Most students reported online sessions exciting and interactive. The participants regarded online learning as a means of escaping from COVID-19 anxiety and recommended its integration in the graduate curriculum in India. However, the research did not provide information on how the satisfaction level was measured. Moreover, the data were collected after 12 days of intervention, which is a short duration to report satisfaction level and to generalize the results.

A review of previous literature shows that online learning is carried along with formal classroom learning; however, various challenges lower its effectiveness and students’ satisfaction. This research adds to the previous studies to modify our existing instructional practices to achieve higher students’ satisfaction with online learning. Students will adapt to online learning if they acquire a high satisfaction level. The study has two phases. The first phase focuses on exploring the challenges in online education and students’ recommendations for overcoming them. The research used an online Google Form with closed and open-ended items for data collection. The second phase aims at working on students’ suggestions and taking guidance from related
literature to modify instructional practices during online education. We consulted four instructors willing to incorporate students’ recommendations in their instructional practices. The data was collected again through the Google Form to explore students’ satisfaction with online learning. The satisfaction level is related to the interaction between instructor and students (Diekelmann & Mendias, 2005), provision of proper guidance, and students’ support system (Vonderwell & Turner, 2005).

**Research Objectives**

1. To explore the challenges in online learning during COVID-19 lockdown
2. To seek students’ suggestion for modifying existing instructional practices in online education
3. To measure students’ satisfaction level with the modified instructional practices

**Research Questions**

The following research questions guided this study.

1. To what extent are students satisfied with online learning during COVID-19 lockdown?
2. What problems students face during online learning, and how can these problems be encountered?
3. How can we modify instructional practices to impact students' satisfaction level with online learning positively?

**Theoretical Framework**

We believe that learners’ feedback and instructors’ leadership have a significant role in the learning process. Any intervention ignoring these factors will be ineffective in warranting learners’ satisfaction. Powers and Rossman (1985) discussed students’ interaction with peers and with the instructor necessary for satisfaction with online learning at the graduate level. Vonderwell and Turner (2005) identified several factors that affect satisfaction levels, such as clear directions about course objectives and assessment, and active student-teacher interaction.

Keeping into consideration these factors, we chose Kranzow’s (2013) guidelines as a theoretical framework due to being a more updated version. Kranzow assigns a leading role to faculty leadership in addressing students’ satisfaction through two channels (Figure 1). The first relates to active faculty-students interaction. The instructor ensures that the course content is easily accessible to students. The students are familiar with technology to attend online sessions. In case the students face any technical problem, the instructors provide necessary facilitation or refer them to students’ support services for expert advice. Moreover, prompt feedback is also essential in online learning to address student's queries and provide them confidence through virtual presence.

The second channel discussed by Kranzow is student-peer interaction. Again, the faculty role cannot be underestimated in establishing this interaction. The purpose of these interactions is to build a strong sense of community, which eliminates the feeling of isolation during online sessions. Building a sense of community relates to creating a community of learning and inquiry. The instructor makes his social and cognitive presence to the class and encourages them towards collaborative learning. The students assist one another with a sense of attachment and cooperation.

This research kept into consideration Kranzow (2013) model to measure students’ satisfaction levels. Moreover, our modification plan for instructors also considered both elements to improve students’ satisfaction levels in online learning.
Material and methods

Procedure

The first phase corresponded to data collection during the start of online instruction. The data collection started in the 3rd week of online education. Due to the lockdown, we collected data through an online Google Form with closed and open-ended items. The class representatives helped in sharing the Google Form with their classmates. The Google Form helped in exploring students’ satisfaction with online learning, the challenges encountered during online education, and students’ suggestions to overcome them. The closed-ended items were related to students’ satisfaction level (table 1), while the open-ended questions enquired about challenges in online learning and students’ recommendations for improving online education. The instrument was constructed by keeping the Kranzow’s model (2013) for students’ satisfaction. These items were properly validated through a team of three experts, and then pilot tested before its administration. The reliability coefficient of the items was 0.79, which was acceptable.

The second phase was working on the students’ suggestions to improve the online learning experience. With proper guidance from the university administrations, the researchers consulted four instructors willing to modify their instructional practices as per findings from phase 1. Data was re-collected in the 12th week using Google Form to explore students’ satisfaction with online learning. The researchers observed ethical guidelines.

Sample

The population was all undergraduate students of a large public sector university in the federal capital of Pakistan. However, we delimit our sample to 6th and 7th semesters of Bioscience department as it was not possible to modify instructional practices across different departments due to constraint of money, time and resources. The sampled university switched to online learning during COVID-19 and had no earlier experience of such mode of learning. A total of 196 students were provided with
the link of the Google form through emails and WhatsApp numbers. The number of valid responses was 179 in the first phase and 163 in the second phase.

**Analysis of Data**

Students’ satisfaction level was measured through seven closed-ended items (mentioned in Table 1). These items were based on a five-point Likert scale ranging from 1 to 5, with 1 representing low and 5 high satisfaction levels. The data helped in calculating the mean and t statistic using IBM SPSS version 25 (Reg.). The challenges in online learning and students’ suggestion for improving online education generated qualitative data which was analyzed thematically by transcribing, coding, and then extracting themes. The themes were further converted into frequencies and percentages to find the magnitude of a specific response. Some of the verbatim responses of the students helped in a deeper understanding of the context.

**Results**

The results are mentioned under the following five headings:

a. Students’ satisfaction level pre-modification
b. Challenges in online learning
c. Suggestions for improving online learning
d. Modifying Instructional practices as per students’ suggestions
e. Post-modification result

**a. Students’ satisfaction levels pre-modification**

Table 1 shows the mean of items related to satisfaction level pre-modification. The satisfaction level was assessed through two methods, first, by seeking students’ responses on the seven items in table 1, secondly, through students’ self-reported satisfaction level on a five-point Likert scale (table 2). We asked the student to express their satisfaction on a scale of 1 to 5 in the order of increasing satisfaction level.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Mean before modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is easy for me to access online classes</td>
<td>2.11</td>
</tr>
<tr>
<td>I help my peer during online learning</td>
<td>1.91</td>
</tr>
<tr>
<td>I understand the content taught in online learning</td>
<td>2.27</td>
</tr>
<tr>
<td>It is easy to use online learning resources</td>
<td>1.98</td>
</tr>
<tr>
<td>I can interact with the instructor during online class</td>
<td>1.91</td>
</tr>
<tr>
<td>I can interact with my peers during online class</td>
<td>1.84</td>
</tr>
<tr>
<td>My queries are adequately addressed in online learning</td>
<td>2.15</td>
</tr>
<tr>
<td>Total of all the items</td>
<td>2.03</td>
</tr>
</tbody>
</table>
Table 2. Comparison of students’ self-reported satisfaction level and as measured from the items

<table>
<thead>
<tr>
<th>Statement</th>
<th>Mean before modification</th>
<th>t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction level from the items</td>
<td>2.03</td>
<td>-1.79*</td>
</tr>
<tr>
<td>Self-reported satisfaction level</td>
<td>1.91</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p>.05

Table 2 shows the mean of students’ satisfaction level measured through the seven items in table 1 and its comparison with students’ self-reported satisfaction level on a Likert scale of 1 to 5. The self-reported mean was lower than the one measured through the items in table 1. The t-test reveals there is no significant difference in the two means, t (178) = -1.79, p>.05. This also supports our seven items scale as reliable for measuring students’ satisfaction levels.

b. Challenges in Online learning

The students’ responses were qualitatively analyzed to identify themes related to challenges in learning online (Figure 2).

Connectivity and the lack of resources

The most-reported problem in online learning was connectivity and the lack of resources (38.2%). Attending online classrooms requires a proper internet connection and ICT devices, which was not available with most of the students. Then the problem of disconnection and slow internet speed resulted in students’ frustration and anxiety. Lastly, frequent power breakdown in the country also impedes access to online learning.

Student A: ‘I do not have a proper internet facility... and it is tough to study online using a mobile phone. I am anxious about my learning.’
Student B: ‘Due to the lockdown, I cannot go to the campus where I have all my equipment, my laptop, and internet device.’
Student C: ‘We have frequent power breakdown in our locality, so I miss my lectures.’

**Lack of interaction**

Interaction with the instructor and peers is a significant determinant of satisfaction with online learning. This problem appeared as another major problem during online classes (29.1%). Besides, the lack of interaction between students and teachers also hinders the learning process. Several students reported that they learn better in groups that are lacking during online sessions.

Student D: ‘I am not getting anything. I miss the face to face interaction with the teacher.’
Student E: ‘The worst form of learning is to sit passively and listen. I learn while interacting with others.’

**Distraction**

Students identified various distractions during online sessions (12.7%). These distractions were related to interference by peers during online class and the disturbance at home. The lockdown confined all the family members to stay at home and involved in different activities. Due to limited space at home, many students cannot find a separate room to interact with the instructors and their peers. This also prevents their participation in online discussions.

Student F: ‘I am unable to concentrate during online classes as most of the students make fun of the procedure.’
Student G: ‘It is hard to study at home because of my siblings and the background noise.’

**Lack of activities**

The online classes lack activities and practical work (10.9%). Due to more emphasis on theories, the students reported a lack of interest and understanding problems.

Student I: ‘I cannot get hands-on experiments in my subjects.’
Student J: ‘My subjects involve practical, and it becomes difficult for me to understand all theories.’

**The problem in setting routine**

Lastly, the students reported difficulty in setting a proper routine to attend online classes (9.1%). The students complained they have many tasks and distractions at home, making it challenging to participate in online courses. The decline of interest in studies during the pandemic also hinders in setting a routine.

Student K: ‘Although I have enough time now, I cannot set a proper routine for study.’
Student L: ‘It is hectic. I am the only daughter, and my mother is a nurse. I have to do all the house chores as my mother has just recovered from a long illness.’

c. Suggestions for overcoming challenges

To overcome the challenges in learning online, the students provided different suggestions (Figure 3).
Students suggested the availability of required resources to attend online classes (26.5%). These resources include the provision of free internet devices, the availability of internet, ICT devices, and uninterrupted power supply.

Student M: ‘The students should be provided free internet devices to reach the online classroom.’

To make online lectures interactive and motivating, students suggested incorporating relevant short videos and simulations (20.6%). This would help in understanding the practical aspect of a topic.

Student N: ‘The major issue is a hands-on experiment, one way to tackle this is to provide simulation videos or material to get that experience at home.’

Another suggestion to improve online instruction is to train teachers for online learning (16.2%). This is highly recommended, as most of the teachers never taught online.

Student O: ‘May the teachers be provided some short training on how to deliver effective online.’

11.8% of students suggested there is no need for online classes at present. The pandemic is spreading, and everyone is worried about one’s safety. The educational institutions shall give a break to help students cope with psychological and family problems.

Student P: ‘I think the best solution for this online teaching is not to do it. We shall focus on our family.’

Student Q: ‘This lockdown shall be treated as the semester break. Studies and other stuff can resume after the lockdown is over’.

Student R: ‘We are worried about our life, not for studies.’

The students suggested fewer courses to set a proper routine and to adjust to the new experience of online learning (5.9%).

Student S: ‘The students should not be bombarded with too many courses.’

Student T: ‘Setting a proper routine is a must for effective studying for which the university shall offer courses in different phases.’

The students proposed short breaks between the lectures (5.9%). The teachers shall add an interesting quiz or assignment to involve students during the lecture.

Student U: ‘There should be short quizzes during the lecture, it will motivate everyone to listen to the teacher carefully.’
d. Modifications in instructional practices

1. Instead of taking a live teaching session, the instructors recorded their lectures using PowerPoint slide recording, video recording or using any other screen recording software. The recorded lectures were shared with the class using OneDrive link or Microsoft Teams at least two days before the scheduled online class. The students were expected to watch the recorded lecture any time convenient to them before the online live session with the instructor.

2. The duration of the online live session was reduced to 30 minutes, with a minimum of three periods per course per week. This 30-minute class was for Question-Answer and discussion on the recorded lecture with the instructors.

3. The timetable for online classes was decided by the instructors after discussions with students to ensure maximum availability during the online session.

4. All the meetings and online sessions were to be held on Microsoft Teams. All the students and faculty members were provided email accounts to work on Microsoft Teams. Moreover, the instructors and students used Microsoft teams for chats, communication, and interaction.

5. All the four instructors were provided online training in Microsoft Teams, arranging meetings, sharing files with the students, sharing laptop screens, conducting online quizzes, assignments, and sharing online resources and videos.

6. For students living in remote areas or with internet issues, the instructors will prepare CDs of the recorded lectures, which will be sent to the students by post for preparation and understanding.

7. The recorded lectures were made interactive, using videos and simulations. This helped the students learn the practical aspect of a topic and its application.

8. The instructors shared some rules for online classes with the students. They would keep their mic off to prevent distraction and would raise their hands in Microsoft Teams when they would ask a question or add to the discussion. The private chat was also an option to interact with the teacher regarding their issues and queries.

9. The instructors keep a record of their weekly lectures, the topic covered, and the students’ attendance for sharing with the concerned coordinator for the official requirement.

e. Result of modification

Table 3 shows students’ responses post-modification. The items provide information about students’ satisfaction with online learning. The means of all items after modifications were higher than the means before modification, and these differences were significant using the t-test. The mean of all the items after modification (3.76) is higher than the mean of all the items before modification (2.03) (table 1), which indicates greater satisfaction with online learning after modification, t (162) = 73.85, p<.05.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Mean after modification</th>
<th>t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Involvement in online learning is fun</td>
<td>3.72</td>
<td>25.63</td>
</tr>
<tr>
<td>I am comfortable with online learning</td>
<td>3.36</td>
<td>14.57</td>
</tr>
<tr>
<td>I understand the content taught in online learning</td>
<td>3.82</td>
<td>18.21</td>
</tr>
<tr>
<td>It is easy to use online learning resources</td>
<td>3.68</td>
<td>19.03</td>
</tr>
<tr>
<td>I can interact with the instructor during online class</td>
<td>4.13</td>
<td>28.44</td>
</tr>
<tr>
<td>I can interact with my peers during online class</td>
<td>3.78</td>
<td>20.30</td>
</tr>
<tr>
<td>My queries are adequately addressed in online learning</td>
<td>3.88</td>
<td>24.20</td>
</tr>
<tr>
<td>Total of all the items</td>
<td>3.76</td>
<td>73.85</td>
</tr>
</tbody>
</table>

* p<.05
Discussion

The students identified some challenges in online learning such as internet connectivity, lack of resources, theory-laden lectures with no activities, weak interaction, difficulty in setting a routine, and home distraction. No doubt, internet services are not available in many parts of the country, and ICT devices are not available, especially in rural areas. Basilaia and Kvavadze (2020) also reported a lack of ICT devices in rural areas. Then comes the problem of reduced bandwidth and the inertia to use technology for learning (Chick et al., 2020). We need to learn from the Chinese government for taking prompt action during the pandemic lockdown and ensuring the availability of fast and stable network services to teachers, parents, and students to make online education successful (Zhang et al., 2020). The Guangdong government in China provided thousands of tablets to students on an emergency basis besides using satellite TV channels for online learning in remote areas (Zhang et al., 2020). Such preparation was not done by the Pakistani government, thus resulting in students’ frustration with the internet services and power breakdown.

To tackle the problem of connectivity and power breakdown, we guided the instructors to avoid live teaching and instead record their lectures. These lectures were shared with the class at least two days before the scheduled day. This provided a flipped classroom experience to watch the recorded lecture in free time and use the online session for discussion and questions/answers (Chick et al., 2020). Recording video lectures also solve a variety of technical problems and help in evaluating content quality (Dhawan, 2020). The instructors were able to add relevant activities, figures, simulations, and supporting videos in their recorded lectures. This improved the quality of the recorded lectures. However, the inclusion of activities and exposure to practical work as a replacement to lab work may still take some more time (Wang, Cheng, et al., 2020).

Online learning is regarded as flexible in terms of time and space. However, the students were not able to set a proper routine due to this flexibility. Dhawan (2020) also reported that students do not find time for online learning during COVID-19 because of too much flexibility. Thus, we felt the need to allocate proper time for online classes. This was done after discussion with the students to ensure maximum availability. The instructors also reduced the duration of online classes to 30 minutes. The reduction in the length of online classes helps set a routine (Basilaia & Kvavadze, 2020). Similarly, the Zhejiang province in China also directed schools to reduce the duration of online classes between 20 to 30 minutes (Zhang et al., 2020). Our modification plan also reduced the online session to 30 minutes for the same reason and to allow the students to adjust to the new system of learning.

Moreover, the training and preparation of instructors for online teaching was also essential. The Information Technology (IT) section arranged online sessions to train the instructors in online education. However, this training was mostly focused on using online tools and not on the delivery of instruction. Online instruction is a complicated process. Even good teachers are unable to deliver quality instruction when it comes to online teaching (Wasserman et al., 2020). This creates the need to train teachers for online education and to support them continuously. As Tobin (2020) rightly concluded, “Good online teaching requires training, prep, and support. The current crisis provides none of that”. Jones and Sharma (2020) commented that students are deprived of quality education at present because of inadequate preparation by educational institutions for such a mode of teaching.

It seems that countries with limited technologies are not prepared for online education during the lockdowns (Sintema, 2020), and the continued closure of schools is likely to accelerate social inequalities (Cohen & Kupferschmidt, 2020). Online learning is neither “cheaper nor easier” (Wasserman et al., 2020). The cost of online education is always higher than the formal classroom delivery. The price is either the capital incurred on the delivery or the cost of poor learning outcomes (Jones & Sharma, 2020).
The data after modification shows improvement in the means of all the items. The students expressed more interest in online learning, viewed it as a fun, and reported more significant interaction with the instructors and their peers as compared to pre-modification. The separate means of all the items after modification was higher than before modification. The result of the t-test revealed that these differences were significant. The mean of all the items (3.76) after modification was higher than the mean before modification (2.03). Thus, the modification in the online program was effective in improving students’ satisfaction level and providing evidence for students’ adoption of online learning during the pandemic. Kranzow (2013) also supported that satisfaction with online experience helps in adapting to the program. One crucial factor that determines satisfaction level is students’ familiarity with using technology and online tools (Bolliger, 2004). The students reported their comfort level with using online tools and working on Microsoft Teams. However, despite students’ satisfaction with the online learning, it cannot offer a replacement to the formal classroom learning that provides more significant interaction and prompt feedback to students’ queries (Cole et al., 2014). Even students expressing a high level of satisfaction with online learning reported that it was not their preferred learning method (Strong et al., 2012). Despite that, we must struggle for learning to occur at home (Pragholapati, 2020).

Conclusion
This research is an effort to make a smooth transition from offline to online learning during the pandemic. The initial data revealed students’ inertia towards attending to learning online. The challenges reported by students in online education were the lack of resources and internet services, lack of interaction during online classes, distraction at home, lack of activities, and difficulty in setting a routine for online learning. Keeping in mind the challenges faced by the students and their recommendations, we introduced modifications in the instructional practices. These modifications are recommended for instructors as helping guidelines to improve online learning. Some of these include recording lectures and then sharing with the students, reducing the duration of the online session to 30 minutes, use of Microsoft Teams for scheduling class and sharing resources, and observing the instructor’s guidelines during online sessions for productive interaction. The research provides useful guidance to educational institutions, instructors, and researchers about a quick transition to virtual education.

Limitations
Post-modification data revealed students’ greater satisfaction with online learning. However, the role of other variables such as practice, instructor, and parental support in affecting satisfaction with online learning cannot be ruled out. Secondly, this study collected data through a single research instrument. The collection of data through different tools and from other stakeholders will add more credibility to the findings.

References


Kranzow, J. (2013). Faculty leadership in online education: Structuring courses to impact student satisfaction and persistence. *Journal of Online Learning and Teaching, 9*(1), 131.


An Evaluation of Online Proctoring Tools

Mohammed Juned Hussein, Javed Yusuf, Arpana Sandhya Deb, Letila Fong & Som Naidu

The University of the South Pacific (Fiji)

just.hussein@gmail.com, javed.yusuf@usp.ac.fj, arpana.debz@gmail.com, Letila.coalala@gmail.com & sommnaidu@gmail.com

Abstract

COVID'19 is hastening the adoption of online learning and teaching worldwide, and across all levels of education. While many of the typical learning and teaching transactions such as lecturing and communicating are easily handled by contemporary online learning technologies, others, such as assessment of learning outcomes with closed book examinations are fraught with challenges. Among other issues to do with students and teachers, these challenges have to do with the ability of teachers and educational organizations to ensure academic integrity in the absence of a live proctor when an examination is being taken remotely and from a private location. A number of online proctoring tools are appearing on the market that portend to offer solutions to some of the major challenges. But for the moment, they too remain untried and tested on any large scale. This includes the cost of the service and their technical requirements. This paper reports on one of the first attempts to properly evaluate a selection of these tools and offer recommendations for educational institutions. This investigation, which was carried out at the University of the South Pacific, comprised a four-phased approach, starting with desk research that was followed with pilot testing by a group of experts as well as students. The elimination of a tool in every phase was based on the ‘survival of the fittest’ approach with each phase building upon the milestones and deliverables from the previous phase. This paper presents the results of this investigation and discusses its key findings.

Keywords: COVID’19, online exam, online proctoring, remote teaching, ICT, evaluation, flexible learning

Introduction

Interest in online learning and teaching has been on the rise for some time and accelerated by the 2019 CORONA virus pandemic. Many of these online courses also include online assessment activities which raises a number of issues and challenges in relation to plagiarism and academic integrity on the whole. One of the ways of coping with some of these challenges is the adoption of online proctoring tools for online assessments.

Online proctoring involves the use of virtual tools for monitoring student activities during assessment activity. These tools (as they continue to overcome their limitations) have the potential for students to take an online exam at a remote location while ensuring the integrity (security and trustworthiness) and reliability of the online exam. This includes the authentication of the student and their identity to secure and maintain the integrity of an exam and its administration (Foster & Layman, 2013).

Online proctoring has two major components. First, the availability of a web-camera on the student’s computing device needs to be activated to video record the physical learning space and everything the student does during the examination period. The examiner or the proctor is able to remotely monitor this video recording. The examiner or proctor is able to identify potential cheating, suspicious movements, and posture such as talking to someone in the room, looking at a book, mobile device, or other printed media for answers. Second, is lockdown, which will prevent the students from using any other computer applications including the Internet browser, and user-computing processes (such as copying, pasting or printing) that can lead to potential cheating during the exam.
This is commonly referred to as “computer or browser lockdown” (Alessio et al., 2017). The proctoring system also records all the student Internet activities during the exam such as websites that the student tried to access. The video recording of the entire exam is made available for review by the instructors or examiners either simultaneously or afterwards.

There are four major features of online proctoring systems; (i) **authentication**: which is the process of ensuring the registered student is the valid student taking an online proctored exam, (ii) **browsing tolerance**: this is the process of setting the limit of student’s ability to use their computer for other tasks, (iii) **remote authorizing and control**: which is enabling the proctor to start, pause and end online proctored exam, and as well as flagging any suspicious student behaviours, and (iv) **report generation**: which is the creation of reports of a student’s activities during a proctored exam.

Generally, there are three types of online exam proctoring:

1. **Live proctoring**: This is real-time proctoring taking place during the exam with a human proctor monitoring/supervising the exam virtually, online. The human proctors are usually trained professionals to ensure the authenticity of the student and look for any red flags such as suspicious eye or facial movements or the appearance of any unverified device that could indicate possible cheating (Gautam, 2007). This requires the exams to be scheduled at a specific time depending on the availability of the proctor on a given date and time. This has equal human involvement as traditional offline exam supervision. However, unlike live proctoring, online proctoring will require competence in the use of technology, and as such much closer vigilance on the approaches of online proctors will be required (Mitra & Gofman, 2016).

2. **Recorded proctoring**: This involves the video recording of camera images and logs of the student taking an online proctored exam, where the proctor reviews the recording at a later time and assesses the integrity of the exam (i.e. whether or not any fraud/cheating was committed during the exam by the examinee). This allows students to take an exam at any time hence allowing multiple exams to take place simultaneously. But, this too requires human intervention for reviewing the recordings, and that can be expensive and difficult to scale as well.

3. **Automated proctoring**: In automated proctoring – human proctors do not monitor (or review) the entire exam, instead, the proctoring system identifies key events of possible fraud or cheating. The proctor is alerted to review these events to determine if fraud or cheating has been committed by the student (Sietses, 2016). This form of online proctoring is generally considered more convenient for the students as they are not required to arrange live proctors for their tests and exams, as there is no schedule, location and human proctor constraints. It is also very scalable as the human component is replaced by artificial intelligence or algorithms. Hence, it is considered more cost-effective (Jose, 2016). However, students’ familiarity with this proctoring system may spawn evasive strategies for fraud prevention. This form of proctoring can also easily produce false positives such as flagging innocent events as potential fraud (Sietses, 2016).

There are many online proctoring systems available that offer the three types of online exam proctoring services mentioned earlier. But, institutions in the midst of choosing and implementing an online exam proctoring system need to consider several factors first. These include (but are not limited to): ease and flexibility of integration with the existing institutional learning management system, technical performance and robustness of the proctoring system (sometimes over low internet bandwidth, poor hardware capabilities or electrical power failures), level of efficient task automation, and reporting capabilities. Privacy protection and management, security and anti-fraud measures, and their associated cost are also other key issues that need to be examined when considering an online proctoring system (Sietses, 2016).
The research that is reported in this paper sought to:

1. Identify online proctoring systems;
2. Test and evaluate selected online proctoring systems;
3. Select and dummy trial of selected online proctoring systems; and
4. Develop procedures and guidelines for online exam proctoring.

**Literature Review**

Interest in the affordances of technology for learning and teaching is on the rise. This is leading to a growing interest in online learning and teaching. When used effectively, online learning is able to provide higher education institutions with flexible options to expand their offerings into the global market (Casey, 2008). However, as institutions continue to grow their online education, there is a commensurate rise in concerns about how best to ensure academic integrity (Barnes & Paris, 2013). The *distance or flexibility* between students and instructors in an online learning environment may, in fact, contribute to the challenges of maintaining the integrity of online assessment. This was also highlighted by Hollister and Berenson (2009) that, “the most commonly reported challenge in online assessment is how to maintain academic integrity”. While proctored exams remain a common tool for assessing student learning, ways of facilitating them continue to evolve from online exams facilitated via learning management systems (LMS) to other online testing platforms (Prisacari & Danielson, 2017). This has raised both academic and non-academic issues, such as the designing and administering of online exams, and monitoring students’ behaviour during exams (Cramp et al., 2019). These behaviours include dishonest and unethical practices by the students such as cheating and fraud.

In their study, King et al. (2009) reported that the majority of students surveyed felt that cheating was easier in an online environment compared to a traditional face-to-face classroom. Similarly, Berkey and Halfond (2015) reported that 84% of the students surveyed in their study agreed that student dishonesty in online test-taking was a significant issue. In a study of 635 students, Watson and Sottile (2010) also noted that students indicated that they would be more than four times more likely to cheat in an online class. Several other studies also found higher rates of cheating online (Lanier, 2006; Harmon & Lambinos, 2008; Grijalva et al., 2006) and prevalence of cheating online compared to in a face-to-face environment (Etter et al., 2006; Watson & Sottile, 2010).

Ensuring and maintaining academic honesty and integrity in any learning environment is vital and significant. When putting this in the context of an online learning environment, Moten et al. (2013) explained that students in these learning environments work independently with relative autonomy and anonymity, and instructors may be uncertain who is taking exams or how best to validate student learning. Therefore, online learning must address issues and challenges of honesty and integrity in student assessment and evaluation. Online proctoring is one way to address this challenge. With technology-based aides, such as computer/system lockdowns, keystroke monitoring, the ability to stop/start a test, and many other assistive proctoring processes (Foster & Layman, 2013) now easily integrated into the monitoring process, online proctoring has now become a viable solution.

Moreover, online proctoring offers both instructors and students other significant advantages. Kinney (2001) noted that online proctoring is a valuable option for students who are geographically dispersed with time differences. Several studies (such as Bedford et al., 2009; Harmon et al., 2010; Rose, 2009; Watson & Sottile, 2010) found that when compared with traditional face-to-face settings, the technologies associated with monitoring of the online examination can provide better exam security and integrity. Karim et al. (2014) in their study found that the use of remote online
proctoring decreases instances of student cheating. Similarly, Kolski and Weible (2019) posited that the importance of academic integrity could be reinforced when students are aware of the instructors reviewing their recorded exam sessions. Likewise, Tao and Li (2012) highlighted that online proctoring reduces instructional time dedicated to testing allowing instructors and students to engage more with the course content.

However, there are mixed findings in terms of student performance in online-proctored exams. Schultz et al. (2007) in their study reported that students who took the non-proctored online exams performed significantly higher than did those in the proctored settings. Similarly, Alessio et al. (2017), Richardson and North (2013), Wellman and Marcinkiewicz (2004) and Carstairs and Myers (2009) reported the same findings with non-proctored test scores being significantly better than proctored test scores in their respective studies. But, other studies (such as Ladyshewsky (2015), Yates and Beaudrie (2009) and Beck (2014) found no significant difference between the test scores in proctored versus non-proctored online tests.

For institutions, selecting the fit-for-purpose online exam proctoring technology can be challenging. While there are not many studies on how institutions selected and integrated online proctoring systems, Brown (2018) describes three factors that can impact the selection of an online exam proctoring solution: cost, security and, instructor and student comfortability with the use of technology highlighting that involving the faculty in the selection of the online proctoring technology would be beneficial. She further identifies technology support staff, teaching staff and students as the three most important stakeholders in the selection process of the fit-for-purpose online exam proctoring technology of an institution (Brown, 2018).

Moreover, Foster and Layman (2013) developed a comparison matrix that describes online proctoring functionality, and compares that functionality across various online proctoring services/products such as proctoring features (human-proctor availability, data transfer encryption, proctor management, recorded review, automated proctoring, incident logs, etc.), lockdown features (browser lockdown, computer operations lockdown, keystroke alerts, etc.), authentication options (facial recognition, photo comparison, keystroke analytics, biometrics, etc.) and webcam features (camera view angles, panning, etc.). This matrix could be useful for institutions in the process of identifying and selecting the right online exam proctoring system.

The purpose of this investigation has been to add to this body of literature with a preliminary investigation, identification, and selection of an online proctoring solution, specifically addressing the following research questions:

1. Which are the most prominent online proctoring systems?
2. How effective and efficient are they for wide-scale adoption in higher education settings?
3. What are the recommended procedures and guidelines for online exam proctoring?

**Methodology**

This investigation was carried out at USP (the University of the South Pacific) which is a regional University that is owned and governed by twelve nations of the southwest Pacific region. These include the Cook Islands, The Republic of Fiji, Kiribati, Marshall Islands, Nauru, Niue, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu and Samoa. The University has campuses in all of the member countries. Its main campus is located in Suva, the Republic of Fiji where the majority of its academic Schools are based, except for the following – the School of Agriculture and Food
Technology, which is situated at the Alafua Campus in Samoa, and the School of Law at the Emalus Campus in Vanuatu. The USP region spreads across 33 million square Kilometres of ocean, an area three times the size of Europe, with a total land mass about the size of Denmark. Population masses in the region vary from 2,000 in Tokelau to more than 800,000 in the Republic of Fiji. For island nations, this widely spread and sparsely populated, online learning and teaching methods, including flexible approaches to the assessment of learning, has had to feature prominently in its educational operations.

The adoption of flexible approaches to the assessment of learning has required a thorough investigation of contemporary online proctoring tools. A 4-phased approach was adopted as part of this process. The elimination of a system in every phase was based on the ‘survival of the fittest’ approach with each phase building upon the milestones and deliverables from the previous phase as per the table 1.

Table 1: Project phases 1 to 4

<table>
<thead>
<tr>
<th>Activity</th>
<th>Activity Description</th>
<th>Milestone/Deliverable</th>
</tr>
</thead>
</table>
| 1. Identify popular online proctoring systems. | i. Desk-based research of popular online proctoring tools.  
ii. Review existing research in online exam proctoring.  
iii. Evaluate selected systems for further review and evaluation. | Research on possible Systems.  
3 systems selected for further review and evaluation. |
| 2. Evaluate selected systems                | i. Develop requirements and matrix for evaluation.  
ii. Trial and evaluate 3 systems as per the requirements and evaluation matrix.  
iii. Select one system for mock trial. | Requirements and evaluation matrix completed.  
One system selected for mock trial. |
| 3. Further understanding the functionalities of the selected system and preparing for mock trial | i. Buy licenses to use the system.  
ii. Develop quick guides for students and teachers for key functionalities of the system.  
   i. Develop tests, identify mock trial students and train them to use the system as an exam-taker.  
   ii. Further use of the system and note how key functionalities operate. | Quick guides developed.  
Mock trial students identified and trained.  
Mock tests and hacks developed. |
| 4. Mock trial of the selected system with the identified students | i. Mock trial carried out. The results and experiences evaluated.  
ii. Student feedback discussed.  
iii. Selected system was further reviewed after Mock trial.  
iv. If necessary, a second mock trial to be undertaken.  
v. Guidelines developed.  
vi. Final Report developed. | Mock trial completed.  
Final Report and Guidelines developed. |
Phase 1 – Desk Research

Phase 1 comprised a rigorous desk-based research of possible online exam proctoring systems. The systems were reviewed and popular online proctoring systems that were used by other universities were selected. Phase 1’s elimination criteria was based on the following:

1. Moodle LMS integration capability.
2. Frequency of security updates (by the system/service provider).
3. Costing (what type of costing model does the system/service use).
4. Cloud-based or does it need physical servers etc.
5. Proprietary or Open Source system/service.
7. How the system handles Privacy issue(s).
8. Peripheral requirements (hardware etc.).

After the desk-based research and review, the following eight systems were identified for further reviewing/testing: ProctorU, Kryterion, Respondus, BVirtual, AIProctor, ProctorU Open Source, Examity and Proctorio.

Phase 2: Evaluation

The selected systems went through a thorough evaluation process. The primary considerations were: infrastructure the system uses, the licencing, end-user support, user verification, frequency of updates, costing models, privacy policy around recordings, type of proctoring services offered, and integration with Moodle. From the outset, the capabilities of each of these systems were as follows:

1. ProctorU (cloud-based, proprietary licence, live proctoring, authentication needed).
2. Kryterion (cloud-based, proprietary licence, live proctoring, authentication needed).
3. Respondus (cloud-based, automated Proctoring, 1000seats/USD4,000).
4. BVirtual (cloud-based, live/recorded/automated proctoring).
5. AIProctor (cloud-based, Artificial Intelligence (AI) proctoring).
7. Examity (cloud-based, live/recorded/automated proctoring, regular updates).
8. Proctorio (cloud-based, recorded/automated proctoring, can be integrated with Moodle).

In Phase 2 even though the plan was to select 3 best systems, we ended up with five equally powerful systems for further review and evaluation: ProctorU, Respondus, AIProctor, ProctorU-Open Source and Proctorio. The evaluation in phase 2 was based on the licences, functionalities, types of proctoring services and the integration capabilities with Moodle as a learning management system.

Phase 3: Further Evaluation

An in-depth research and review was carried out for each of the selected 5 systems. Since ProctorU Open Source required more time to set-up and test than our project/research timeline, the team decided to drop ProctorU from further testing (table 2).
### Table 2: Evaluation matrix used in Phase 3

<table>
<thead>
<tr>
<th>Proctoring Features</th>
<th>ProctorU</th>
<th>Respondus</th>
<th>Proctorio</th>
<th>AIProctor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live human proctors available</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Internet required</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Secure/encrypted transferring of data</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Student able to book exam time</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Training provided</td>
<td>Yes</td>
<td>n/a</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Proctoring provider certified</td>
<td>Yes</td>
<td>n/a</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Students can interact with proctors</td>
<td>Yes</td>
<td>n/a</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Student can message issues to proctors</td>
<td>Yes</td>
<td>n/a</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Students get live exam instructions</td>
<td>Yes</td>
<td>n/a</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Proctor able to see students screen</td>
<td>Yes</td>
<td>n/a</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Stop proctor to view students screen</td>
<td>No</td>
<td>Yes</td>
<td>n/a</td>
<td>No</td>
</tr>
<tr>
<td>Recorded video reviewing option</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Pause test/ cancel test</td>
<td>No</td>
<td>n/a</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Automated proctoring</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Keystroke checking</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Audio recording</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Browser lockdown</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Authentication option</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Web camera needed</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Log reports</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Recording storage option</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Test review option</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Incident logs with date &amp; time</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Customising options for institution</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td><strong>Lockdown Features</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Available on both Windows and Mac</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Plugin for browser</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Avoids control options on the browser</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Stops navigation (forward/back)</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Stops concurrent tests</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Stops right clicks using mouse</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Stops printing</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

(Continued)
Selections for mock trial

In the end Proctorio appeared more favourable than ProctorU and the costing model for Proctorio was also better than the ProctorU. ProctorU was charging an hourly rate for each exam, whereas, Proctorio has an annual fee per student with an unlimited number of online exams. Hence, Proctorio (2019) was selected for the proctoring trials.

**Phase 4: Mock trials**

i. Mock trials with staff

A mock-proctored online test was prepared and the research team members attempted the test and tried cheating for example: using a mobile phone, opening a new browser tab, talking to someone in the room, looking at notes in a book and looking away from the screen. The incident reports were recorded and discussed with the experts from Proctorio via a Zoom meeting. The first mock-trial
team also comprised two staff from the Learning Systems team at USP to look at the technical aspects of the testing.

Using the convenience sampling method another proctored online test was prepared and Learning Designers and Educational Technologists, Electronic Publishers, Lecturers and Tutors based in regional Lautoka, Labasa, Samoa and Tonga campuses of the University were requested to attempt the test \( n = 34 \). This was a voluntary activity. After the test was attempted, the team had discussions with the participants and they were asked to share their experiences. This gave the team a starting point for the mock trials with students. Issues such as: how to install the Proctorio plugin, using nComputing computer, how to read an incident report, how to restart a test, and to get technical support from Proctorio.

During the regional testing, the staff (Lecturers and Tutors) had a face to face focus group discussion where they shared their experiences and what the felt about the examination proctoring system that is being tested.

ii. Mock trials with students

Using the convenience sampling method, Mock trials were carried out in the following regional campuses of the University: Lautoka, Labasa, Samoa and Tonga \( n = 128 \). These campuses had summer classes running at the time the Mock trials were being conducted and students were available for the mock trials. After the students took the test, they were given a set of questions and were requested to rate their experiences. These included: Proctorio as a proctoring tool; were they able to complete the test; their ability to easily navigate through the system; clarity of instructions within the system; and they were comfortable in taking the proctored test.

After the students took the mock-proctored test, focus group discussions were conducted. The students ranged from Pre-degree to Postgraduate levels. The students came from mixed ethnicity and socio-economic backgrounds. In doing so, a huge reception from the students was noticed at the regional campuses for the proctoring system to be implemented. During the face to face focus group discussions, the students thanked the team for trialling such a system as this will eliminate most of the travelling expenses for tests. The students also liked the idea of taking the test anytime within the timeframe provided for the online tests.

The teaching staff at these campuses were also given a chance to attempt a separate mock test. The student mock test incident reports were discussed with the teaching staff. This helped the teaching staff better understand why some students received high incident reports.

**Results from Mock-trials**

<table>
<thead>
<tr>
<th>Campus</th>
<th>1 (Not at all)</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 (Very Much)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labasa</td>
<td>0%</td>
<td>6%</td>
<td>6%</td>
<td>27%</td>
<td>61%</td>
</tr>
<tr>
<td>Tonga</td>
<td>0%</td>
<td>0%</td>
<td>5%</td>
<td>5%</td>
<td>90%</td>
</tr>
<tr>
<td>Lautoka</td>
<td>0%</td>
<td>3%</td>
<td>5%</td>
<td>28%</td>
<td>64%</td>
</tr>
<tr>
<td>Samoa</td>
<td>7%</td>
<td>7%</td>
<td>7%</td>
<td>0%</td>
<td>79%</td>
</tr>
</tbody>
</table>

*Open Praxis*, vol. 12 issue 4, October–December 2020, pp. 509–525
Results in Figure 1 illustrate that user experience with Proctorio was positive for students from the respective campuses. The Samoan students did report a slightly less enjoyable experience and the reason became clear when their understanding of the applications was looked at in Figure 5.

Table 4: Were you successful in completing the test with Proctorio?

<table>
<thead>
<tr>
<th>Campus</th>
<th>1 (Not at all)</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 (Very Much)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labasa</td>
<td>12%</td>
<td>0%</td>
<td>3%</td>
<td>9%</td>
<td>76%</td>
</tr>
<tr>
<td>Tonga</td>
<td>0%</td>
<td>0%</td>
<td>5%</td>
<td>15%</td>
<td>80%</td>
</tr>
<tr>
<td>Lautoka</td>
<td>7%</td>
<td>0%</td>
<td>2%</td>
<td>13%</td>
<td>79%</td>
</tr>
<tr>
<td>Samoa</td>
<td>7%</td>
<td>7%</td>
<td>0%</td>
<td>0%</td>
<td>86%</td>
</tr>
</tbody>
</table>

Results in Figure 2 illustrates that the completion of test with Proctorio was positive for students from the respective campuses. 14% of Samoan students did report that they were unsuccessful in completing the test. This was largely due to connectivity issues that they faced during the test.
Table 5: Were you able to control the system (E.g. able to navigate throughout the quiz)?

<table>
<thead>
<tr>
<th>Campus</th>
<th>1 (Not at all)</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 (Very Much)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labasa</td>
<td>6%</td>
<td>6%</td>
<td>6%</td>
<td>18%</td>
<td>64%</td>
</tr>
<tr>
<td>Tonga</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>25%</td>
<td>75%</td>
</tr>
<tr>
<td>Lautoka</td>
<td>3%</td>
<td>3%</td>
<td>3%</td>
<td>16%</td>
<td>74%</td>
</tr>
<tr>
<td>Samoa</td>
<td>7%</td>
<td>7%</td>
<td>0%</td>
<td>14%</td>
<td>71%</td>
</tr>
</tbody>
</table>

A majority of the students from the four campuses had very little to no navigation issues throughout their quiz attempt. It was however noted that there were a few challenges (12% and 14% at Labasa and Samoa campus respectively) and these were evident during ID verification and when adding the Proctorio Chrome Extension.

Table 6: Is the instructions provided by the Proctorio clear?

<table>
<thead>
<tr>
<th>Campus</th>
<th>1 (Not at all)</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 (Very Much)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labasa</td>
<td>9%</td>
<td>0%</td>
<td>9%</td>
<td>6%</td>
<td>76%</td>
</tr>
<tr>
<td>Tonga</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>10%</td>
<td>90%</td>
</tr>
<tr>
<td>Lautoka</td>
<td>5%</td>
<td>0%</td>
<td>5%</td>
<td>8%</td>
<td>82%</td>
</tr>
<tr>
<td>Samoa</td>
<td>7%</td>
<td>0%</td>
<td>7%</td>
<td>0%</td>
<td>86%</td>
</tr>
</tbody>
</table>

A majority of the students from the four campuses had very little to no navigation issues throughout their quiz attempt. It was however noted that there were a few challenges (12% and 14% at Labasa and Samoa campus respectively) and these were evident during ID verification and when adding the Proctorio Chrome Extension.
The high number of positive responses in all the four campuses in Figure 4 signifies that the instructions provided to students which they followed before the actual test commenced were stated clearly and in detail. Students are quite familiar with doing online quizzes on Moodle and with Proctorio embedded to the quiz, there are hardly any major changes except for the ID verification which students have to undergo before they attempt the quiz.

<table>
<thead>
<tr>
<th>Campus</th>
<th>1 (Not at all)</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 (Very Much)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labasa</td>
<td>30%</td>
<td>6%</td>
<td>6%</td>
<td>12%</td>
<td>45%</td>
</tr>
<tr>
<td>Tonga</td>
<td>45%</td>
<td>10%</td>
<td>10%</td>
<td>5%</td>
<td>30%</td>
</tr>
<tr>
<td>Lautoka</td>
<td>36%</td>
<td>5%</td>
<td>7%</td>
<td>11%</td>
<td>41%</td>
</tr>
<tr>
<td>Samoa</td>
<td>36%</td>
<td>7%</td>
<td>7%</td>
<td>29%</td>
<td>21%</td>
</tr>
</tbody>
</table>

It can be seen that students overall experience while doing a proctored quiz is challenging and uncomfortable. This is quite understandable as this is the first time for them to verify themselves using web cameras and their identification cards. Most of the students indicated during the focus group discussions that they had never used a web camera before and they faced problems trying to verify their ID cards as they had to hold it properly before the picture could be taken off the card. This process indicated discomfort for most of the students across the campuses.

**Key Findings**

1. Students incur a great deal of time and money to travel to campuses to sit for tests.
2. This cost can be eliminated with online proctoring. The team tested the Proctoring system with very low Internet speed and received positive results.
3. Online proctoring can easily be integrated into Moodle without additional infrastructure.
4. Students are generally positively disposed towards the use of online proctoring.
Discussion of the Findings

How students felt (and what they requested)

The data that has been gathered clearly displays the excitement of our regional students for the implementation of the new system. A larger number of students agreed to the idea of having online tests, but were concerned about the extra step before the start of examination for user verification.

During the setup and user authentication period, students were anxious, but later they were at ease, however, some students shared that they felt uncomfortable that the camera was recording every movement of theirs. Using an automated system would make the students a little more relaxed knowing that there is no one on the other side of the camera watching. This could be a cheaper option as well and which does not require lecturers and students to book examination proctors/invigilators. Students were concerned about the privacy of the videos and its use. Even though an automated system was used for mock trials, the recording is available for the lecturers to review, if there is a need.

Concerns from the teaching staff

At first the teaching staff were concerned that this would require a lot more work from their end, but the system is such that once integrated with Moodle, it would only require lecturers to select proctored option when creating a quiz (quiz creation process remains the same on Moodle). The rest of the settings will be set as default by the administration team. After the mock trials, the teaching staff were convinced that setting up and monitoring the system is easier than what they initially thought.

General global observation (COVID’19)

The COVID’19 pandemic is causing a great deal of disruption across the globe. At a time like this, there is likely to be a greater need for educational institutions to rethink their approaches to learning, teaching, and its accreditation, including adoption on online technologies. (CAUDIT/ACODE, 2020).

However, learning and teaching online is not without its challenges. Luxuries such as access to a personal computer or laptop, a neat and tidy room with sufficient lighting, internet connectivity, food, water or even basic necessities may not be as readily available for many of our students. Students in many developing contexts, such as in the South Pacific region could be looking after the whole family (siblings or babies while studying at the same time) or looking after ill family members. Global observations need be to taken into account when trying to consider a system that will be used for taking exams online.

Pedagogical consideration

As the subject matter experts, the course coordinators should be involved in the entire design of the assessments (CAUDIT/ACODE, 2020). We are not looking for short-term solutions that can be solved with just adding a tool. The school, subject matter expert and the learning experience designers should look for alternate assessment strategies that could be employed for learning outcomes that were purely tested in tests and exams.
We can split the exam into parts where some learning outcomes are tested with proctored exams and others in the form of written assessment. It does not matter which tool we use to assess the learning outcome, what matters is how you use it and its effectiveness in achieving the learning outcomes. With COVID’19, we should consider allowing the students with an option to opt-out of exams, yet still be given a chance to complete the course purely through coursework.

**Technological consideration**

Before jumping into an expensive option of using an online proctoring system, we should consider using existing technologies that an institution might have (CAUDIT/ACODE, 2020). Moreover, this could be useful as a temporary solution for a proctored exam. This could include but are not limited to video conferencing tools such as Remote Conferencing Tool for Teaching (REACT), Viber on computer or ZOOM. Where students are connected virtually to teachers and are being watched throughout the examination period. And are able to demand that a particular student shares desktop if the examiner is suspicious.

It is also possible to allow students to write answers to examination questions on a blank piece of paper and have a picture of it taken and uploaded for marking. All this could be done during the video conferencing session that is proctored. However, this would mean that we have to all come online at once or in cohorts. They will allow students to do all the necessary calculations and show working for each of the questions they attempt.

Handwritten examination scripts can be marked using Plugins such as the Crowdmark, which can be fully integrated with learning management systems including: MOODLE, Canvas, brightspace, Blackboard and Sakai (Crowdmark, 2020).

If we are going to use the online quiz modules for examinations, we should look at options where students are able to write complex formulas using a computer mouse. These could be available within the LMS or installed as an external plugin. An example of this is WIRIS, which is a proprietary software that allows students to write symbols and equations using a computer’s mouse and it converts proper fraction, equation or symbol.

**Conclusion and Recommendations**

Online proctoring has its challenges. Unlike a live examination, online proctoring requires students to have access to suitable technological infrastructure, without which the option will not work reliably. Naturally, this creates a divide between those with, and without access to this technological infrastructure. Then there are those students with disabilities who may require a lot more assistance than is possible while taking online-proctored exams. There are also concerns around how the recorded video is interpreted, and used by others. These issues are not likely to go away, which means that online proctoring can only be offered as just another solution alongside other options. It ought not to be promoted as the only solution and should be adopted and used carefully and selectively in contexts and situations where it is the best solution.

In light of these concerns and considerations, the following recommendations ought to be considered in the adoption of online proctoring as part of examination processes.

1. **Prepare recommended online examination procedures.** Having a university-wide recommended online examination procedure would help the lecturers to facilitate the online tests in a uniform manner. This will also provide clarity around roles and responsibilities of the lecturer and that of the student.

2. **Trial the proctoring system with live courses that have large regional student numbers.** At the moment we have results from mock trials, but it will be beneficial if there are test results from live courses (and during peak periods).

3. **Ensure a computer lab (equipped with the hardware and software requirements) is designated to students who do not have their own laptops.** Not all students are able to find a quiet, well-lit room to sit for the examination.

4. **Ensure that the hardware and software requirements for the proctoring system are met.** There are certain requirements for using the proctoring system. These are a web camera and browser plugins...

Furthermore, meeting these expectations ought not to be seen as a one-time-fix. All of these recommendations will require ongoing monitoring and maintenance. Students with different types of disabilities would require additional assistance taking online-proctored exams. Furthermore, with online exams, we will be pushing students to procure tools that they would not need if they just sat for a paper-based exam. These will include such things as digital cameras, headphones, extra lighting in the room, laptops or desktop computers. We must ensure that the end-users of the system know how to use the system, and are comfortable in using the system before rolling it out.

**Acknowledgement**

The team would like to acknowledge the contributions of following people who helped in the evaluation and testing phases of the research:

1. Ms. Vasiti Delana
2. Mr. Sanjeet Chand
3. Mr. Daryl Abel

**References**


Crowdmark (2020). Crowdmark is a collaborative online grading and analytics platform. Retrieved April 14, 2020, from [https://crowdmark.com/](https://crowdmark.com/)


What About Reuse? A Study on the Use of Open Educational Resources in Dutch Higher Education

Marjon Baas
Saxon University of Applied Sciences & Leiden University (The Netherlands)
m.a.a.baas@iclon.leidenuniv.nl

Robert Schuwer
Fontys University of Applied Sciences (The Netherlands)
r.schuwer@fontys.nl

Abstract
Extensive research has taken place over the years to examine the barriers of OER adoption, but little empirical studies have been undertaken to map the amount of OER reuse. The discussion around the actual use of OER, outside the context in which they were developed, remains ongoing. Previous studies have already shown that searching and evaluating resources are barriers for actual reuse. Hence, in this quantitative survey study we explored teachers’ practices with resources in Higher Education Institutes in the Netherlands. The survey had three runs, each in a different context, with a total of 439 respondents. The results show that resources that are hard or time-consuming to develop are most often reused from third parties without adaptations. Resources that need to be more context specific are often created by teachers themselves. To improve our understanding of reuse, follow-up studies must explore reuse with a more qualitative research design in order to explore how these hidden practices of dark reuse look like and how teachers and students benefit of it.

Keywords: Open Educational Resources, OER, Higher Education, Adoption, Reuse

Introduction
The movement around Open Educational Resources (OER) focuses on making educational resources available to all through the use of open licenses. These licenses enable a teacher to reuse, revise, remix, redistribute and retain the resource (Wiley, n.d.) and thereby enabling a teacher to align resources to their own teaching needs (Belikov & Bodily, 2016). Teachers can search for OER in online repositories in which the number of OER available is growing continuously (Creative Commons, 2017). Online repositories implement drivers that contribute to reuse by providing indicators to encourage reuse through intentionality, versioning, licenses, granularity, open formats, quality assurance or a community of users (Santos-Hermosa et al., 2017). Yet, despite the vast number of OER available in online repositories, too little is known about the use of these resources by teachers. The discussion around the actual use of these resources, outside the context in which they were developed, remains ongoing. Even though some studies explore the repurposing of resources within a specific course (Greaves et al., 2010; Windle et al., 2010; Wills & Pegler, 2016) and provide insights into the process of adapting resources to specific teaching needs, these findings are results of funded projects on OER adoption. These findings do not illustrate the day-to-day procedure teachers follow in selecting and using resources outside such dedicated OER projects. This might imply that either adoption is not taking place, or that so-called ‘dark reuse’ takes place frequently, intervening in the practices around OER adoption. The term ‘dark reuse’ was posed by Wiley (2009) and describes the fact that teachers either receive resources through their personal contacts or already have a database of resources.
collected over time. It could be that these resources are open and that teachers are thereby engaging with OER, however without being aware of doing so. Yet, there is scant insight available into the amount of reuse of OER and to what extent ‘dark reuse’ might be prevalent. Only a small number of studies explore OER adoption into detail. In this study, we will therefore contribute to this research area by gaining insights into teachers’ reuse behavior.

**Adoption of OER**

Extensive research has taken place over the years to examine the barriers of OER adoption. Based on a desk research, Cox & Trotter (2017) formulated the OER Adoption Pyramid to visualize the different factors that account for OER adoption. The basic necessities are access to (1) infrastructure and the (2) permission of the institute to use and/or create OER. When that is accounted for, then it is important that teachers have (3) awareness of OER and how it differs from other educational resources. Recent studies, however, show that this is often not yet the case since teachers are unsure about the defining characteristics of OER (Baas et al., 2019). If teachers have awareness, then they also need the (4) capacity to find, use, create and/or upload OER. All this, however, is still reliant of the (5) availability of relevant OER with requisite quality. Only when all these five factors are in place, teachers might be fortified to engage with OER (volition). When teachers engage with OER, several key practices are defined in different OER engagement models. Gurell (2008) defined five practices: finding, composing, adapting, reusing and sharing OER. Clements & Pawlowski (2012) also defined five practices in their re-use process for teachers reusing OER: search, evaluate, adapt, use and possible share OER. Stagg (2014) developed an OER continuum model specific for a Higher Education context based on a literature review and prior models. The author also included a relevant development in this model, namely that of Open Educational Practices. Open Educational Practices can be defined as “practices which support the (re)use and production of OER through institutional policies, promote innovative pedagogical models, and respect and empower learners as coproducers on their lifelong learning path” (Andrade et al., 2011, p. 12). The continuum model approaches OER adoption from the teachers’ perspective and includes the following five, not necessarily linear, phases: awareness / access (basic replacement), sharing a newly authored OER, passive practitioner remix, active practitioner remix, student co-creation. Pulker and Kukulsma-Hulme (2020) developed a model describing the activities that teachers engage with when they search for, use and adapt OER. Again, five categories were defined: finding inspiration, re-appropriating, reflecting, learning and developing, and sharing in closed spaces.

While all these models are based on literature reviews and empirical studies, insights into teachers’ actual use of OER is still limited. Even though adoption itself is not the goal (Ehlers, 2011), integrating OER in education can lead to better teaching practices and learning experiences for students (Rolfe, 2017). However, as visible in previously discussed models, it requires that teachers are aware of the defining characteristics of OER and adapt and revise resources if necessary, in order to consciously engage with OER. Nonetheless, this consciousness is often an issue and it is suggested that many practices of OER adoption happen ‘below the radar’ (Baas et al., 2019; Beaven, 2018), which is better known as ‘dark reuse’ (Wiley, 2009).

**Dark reuse**

Dark reuse describes the OER practices that are hidden. These practices are hidden, because teachers are either not aware that they are using OER, teachers receive resources from their colleagues (which might be OER), or teachers already have resources in their personal collections.
To explore the phenomena of dark reuse, Beaven (2018) executed an empirical study of OER engagement among language teachers at a distance university. The findings showed that teachers engaged with all five phases of the OER lifecycle model of Gurell (2008). However, most of these practices appeared to be hidden and only took place in private spaces. Beaven therefore concluded that ‘dark reuse’ is a strong element of teachers’ engagement with OER.

**Goal of this study**

Previous research mainly measured adoption with instruments in which teachers were directly asked about their use of OER. The concept of OER however is often too ambiguous (Baas et al., 2019; Schuwer & Janssen, 2018). Therefore, to explore reuse it seems better to base that on teachers’ practices in general without explicitly mentioning the term OER. In order to be able to fully reach the potential of OER in the Netherlands, it is of importance to gain more insights into the current state of reuse. Especially, since adoption of OER is a main theme within the Dutch Higher Education system. In 2015, the Ministry of Education published its Strategic Agenda in which the educational ambitions for the next 10 years were described. With regards to OER the following was formulated: “I call on institutes and their teaching staff to share their educational resources and to use materials from their colleagues both inside and outside their institutes” (Ministry of Education, Culture and Science, 2015, p. 30).

As previous studies in the Netherlands have already shown that the activities ‘search’ and ‘evaluate’ are barriers for actual reuse (Baas et al., 2019; Schuwer & Janssen, 2018), we will focus explicitly on practices of teachers who have already successfully searched and evaluated resources. Hence, this study aims to analyze the current state of reuse by teachers, in which we will analyze which resources are used by teachers, how they are adapted and to what extent these resources are accessible to others. This maps on the activities ‘adapt’, ‘use’ and ‘share’ in the model of Clements & Pawlowski (2012).

**Method**

**Participants**

To gain an overview of the current situation regarding reuse and whether ‘dark reuse’ might be prevalent, teachers in the Netherlands were invited to participate in an online questionnaire. The questionnaire was deployed in three runs:

1. A community of teachers in a Bachelor Nursing program in 12 Dutch Universities of Applied Sciences (September – October 2018)
2. Teachers in a Bachelor ICT program in one Dutch University of Applied Sciences (November 2018 – January 2019)
3. All teachers in Dutch Research universities and Universities of Applied Sciences (May 2019 – October 2019)

For each of these runs, an open call was issued in which we used different approaches depending on the context. For run 1, the open call was posted on the community platform and in institutional newsletters. This resulted in a response of 118 teachers, of which 116 were usable to include in the analysis. For run 2, an open call was sent by a direct and personal e-mail which was repeated after one month, and the call was also communicated in the department newsletter. This resulted in a response of 82 teachers, of which 74 were usable to include in the analysis. For run 3, the
open call was regularly sent out by social media and in national newsletters. This resulted in a response of 239 teachers, of which (depending on the question) 129–150 were usable to include in the analysis. Combined, a total of 439 teachers from 32 higher education institutes participated in the three runs of the questionnaire. The general characteristics of the participants for run 1 and run 3 can be found in Table 1. For run 2 the demographic questions were not included in the survey, because this could potentially compromise the anonymity of the respondents (all being employed in the same department).

### Table 1: General characteristics of participants in run 1 and run 3 (n = 243)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Categories</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>n</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>141</td>
</tr>
<tr>
<td></td>
<td>Other / do not want to say</td>
<td>7</td>
</tr>
<tr>
<td>Age</td>
<td>≤ 25 years</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>26 - 35 years</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>36 - 45 years</td>
<td>77</td>
</tr>
<tr>
<td></td>
<td>45 - 55 years</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>&gt; 55 years</td>
<td>47</td>
</tr>
<tr>
<td>Teaching experience</td>
<td>0 - 2 years</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>3 - 5 years</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>6 - 10 years</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>&gt; 10 years</td>
<td>85</td>
</tr>
</tbody>
</table>

During data collection several actions were undertaken to manage ethical issues. Data collected in the questionnaires were anonymous as teachers were invited indirectly, making it impossible to trace a response back to an individual.

**Procedure**

In the open call, the research objectives were explained after which teachers could choose to fill out the questionnaire. To be able to analyze the current state of reuse, the first question was aimed to select teachers that are actively involved in teaching. If a participant selected that they were not a teacher in the past or current academic year or if they did not use any digital resources in their courses, they were redirected to the end of the survey. Based on these questions, our target group has been defined. From the 439 responses, 53 were not in the target group.

**Questionnaire**

The questionnaire was designed to gain more insights into the extent of reuse. Before administering each run, the questionnaire was tested by 15 teachers to optimize the instrument. This resulted
in some minor changes for some items between the three runs of the questionnaire, which will be discussed in detail in the next sections.

Field of study
To be able to understand the context in which teachers teach, three questions were asked. In run 1 and 2, the field of study was clear (Nursing respectively ICT). In run 3, teachers were asked to select the field of study of the course from a list based on the website Studiekeuze123 ([https://www.studiekeuze123.nl/](https://www.studiekeuze123.nl/)), established by the Ministry of Education, Culture and Science. In addition, questions were formulated to understand the level of education (e.g. bachelor or master) and the setting of the course (e.g. if the teacher is part of a team of teaching the course on its own). For the sake of convenience, in the remainder of this article the three runs will be referred to as Nursing (run 1), ICT (run 2) and NL (run 3).

Use of resources
First, teachers got the assignment to take one course in the current or previous year in mind and answer all questions in the questionnaire for that specific course. To gain more insights into the kind of resources that are being used, teachers were asked to select resources that they use in their selected course from an extensive list (e.g. textbooks, presentations, or resources from other courses). As previously mentioned, there were some small differences between the three runs in the questions. One difference is that we added the resource ‘digital tool’ in ICT due to the fact that in the review of the questionnaire it was commented that this type of resource was missing since ICT teachers often use digital tools. Another difference is that, based on insights of Nursing and ICT, we added the distinction between a non-digital study book and a digital study book in NL.

Origin of resources
To analyze if and how adaptations of resources took place, teachers were asked about the origin for each of the selected resources. Teachers could select multiple answers of

- ‘I have developed this material myself and have not or hardly reused material from third parties’,
- ‘I developed this material myself and mainly reused material from third parties (e.g. by mixing learning material from third parties)’,
- ‘I have got this material from third parties and did not make any adaptations to it myself’,
- ‘I have got this material from third parties and have made adaptations to it myself’

For NL and ICT, the fourth option was split into two separate answers:

- ‘I have got this material from third parties and have made minor adaptations to it myself’,
- ‘I have got this material from third parties and have made major adaptations to it myself’.

Explanatory notes were provided to explain the differences between major and minor adaptations. However, in the analysis we combined these two so that it became possible to compare with Nursing.
Access to resources

The last questions of the questionnaire focused on the access of resources that are used in their course. For each resource that they had selected previously, teachers could select multiple answers ranging from: ‘Only accessible for students, teachers and other persons in the own institute’, ‘Accessible to a private group of students, teachers and other persons, not necessarily from the own institute’, ‘Unlimited access for everyone from all over the world’, to ‘I do not know’.

Volition to reuse resources

In NL, we also wanted to gain more insights into teachers’ volition to reuse resources and their awareness regarding OER. It became clear in the previous runs of the questionnaire that this information could provide institutes with a better understanding of teachers’ behavior regarding reuse. Teachers’ volition to reuse resources was measured with a selection list of possible motives based on Jhangiani et al. (2016).

Awareness

In NL, two items were used in which teachers were asked to self-report their level of awareness of openness. First, teachers were asked whether they were familiar with open licenses (e.g. Creative Commons). If their answer was yes, a follow-up question was posed in which teachers were asked whether they checked the open license for rights to adapt the resource. Answer options ranged from ‘I (almost) always do’, ‘I sometimes do’, ‘I (almost) never do’.

Analysis

The first phase of the analysis was to analyze each data set individually. Descriptive analysis was undertaken to gain insights for each run. After the analysis of each data set, we made a comparison document of changes we made in the three questionnaires. Based on this overview, we decided to exclude some questions from further analysis across the three runs. Then, we combined the data sets for the questions that were similar in nature. We kept record of the origin of the data, so that we could compare the results across the three runs. We performed chi-square tests to examine differences between the three runs.

Findings

Field of study

For the runs Nursing and ICT, the field of study was already set, respectively Health for Nursing and Science and Computer Science for ICT. All courses within these two runs, as taken in mind by teachers when answering the questionnaire, are offered in the Bachelor phase. For the run NL, the field of study was unknown. Therefore, in this questionnaire teachers were asked to define their field of study and the phase of the program in which the course was offered. Teachers (n=150) teach in a wide range of fields, but most often stated are Health (22.7%), Science and Computer Science (14.7%), Economy and Business (14.0%), and Educational Studies (12.0%). Most courses are taught in the Bachelor phase (80.2%).
Additionally, we wanted to examine if teachers were part of a teacher team for their selected course or whether they teach the course alone. The result show that in all three runs teachers are most often part of a teacher team, respectively 96.6% at Nursing, 83.3% for ICT and 72.7% for NL.

Use of resources

In each selected course several resources are used by teachers. The result show that presentations, exercises, videos, and pictures are used the most. Interactive games and (part of) a digital course created by a third party are used the least. Resources that are mentioned under ‘Other’ are digital pinboard (e.g. Padlet), Mentimeter, digital microscopy, live coding demos, online conferences (webinars), discussion forums and user manuals. What we can derive from the results (Table 2) is that there are little differences in the use of resources between the three runs. The main differences can be found in the use of assessments, (parts of) digital courses and interactive games.

<table>
<thead>
<tr>
<th>Resources</th>
<th>Nursing (n=116)</th>
<th>ICT (n=74)</th>
<th>NL (n=129)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentations</td>
<td>95.7%</td>
<td>85.1%</td>
<td>88.4%</td>
</tr>
<tr>
<td>Exercises</td>
<td>83.6%</td>
<td>93.2%</td>
<td>77.5%</td>
</tr>
<tr>
<td>Videos</td>
<td>81.9%</td>
<td>75.7%</td>
<td>73.6%</td>
</tr>
<tr>
<td>Pictures</td>
<td>79.3%</td>
<td>60.8%</td>
<td>58.9%</td>
</tr>
<tr>
<td>Articles</td>
<td>68.1%</td>
<td>47.3%</td>
<td>58.1%</td>
</tr>
<tr>
<td>Assessments</td>
<td>61.2%</td>
<td>24.3%</td>
<td>59.7%</td>
</tr>
<tr>
<td>Study book</td>
<td>45.7%</td>
<td>41.9%</td>
<td>48.1% (non-digital) 51.9% (digital)</td>
</tr>
<tr>
<td>Digital tool</td>
<td>-</td>
<td>33.8%</td>
<td>40.3%</td>
</tr>
<tr>
<td>(part of) course of 3rd party</td>
<td>11.2%</td>
<td>32.4%</td>
<td>33.3%</td>
</tr>
<tr>
<td>(part of) course of colleagues</td>
<td>27.6%</td>
<td>40.5%</td>
<td>24.8%</td>
</tr>
<tr>
<td>Interactive games</td>
<td>27.6%</td>
<td>8.1%</td>
<td>16.3%</td>
</tr>
<tr>
<td>Other</td>
<td>12.9%</td>
<td>21.6%</td>
<td>13.2%</td>
</tr>
</tbody>
</table>

*Note: n = number of teachers reporting to use this resource in their self-selected course*

Measure of reuse

To find out about the origin of the learning materials, the results for all three runs were combined (see Table 3). The results show that most resources are from third parties without adaptations. This accounts especially for videos (68.5%), pictures (53.7%), articles (82.5%) and courses of third parties (50.7%). Assessments (59.1%), exercises (45.6%), interactive games (45.1%) and presentations (41.7%) are often self-developed with little or no reuse. It appears that resources
that are self-developed with reuse of resources does occur little, while reusing resources of third parties with adaptations most often occurs for courses developed by colleagues (57.3%) and third parties (41.3%).

Table 3: Measure of reuse (%), combined for all three runs (n=314)

<table>
<thead>
<tr>
<th>Resources</th>
<th>Measure of reuse (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Self-developed no reuse</td>
</tr>
<tr>
<td>Presentations</td>
<td>41.7%</td>
</tr>
<tr>
<td>Exercises</td>
<td>45.6%</td>
</tr>
<tr>
<td>Videos</td>
<td>12.5%</td>
</tr>
<tr>
<td>Pictures</td>
<td>10.6%</td>
</tr>
<tr>
<td>Articles</td>
<td>3.5%</td>
</tr>
<tr>
<td>Assessments</td>
<td>59.1%</td>
</tr>
<tr>
<td>Study book</td>
<td>19.0%</td>
</tr>
<tr>
<td>(part of) course of 3rd party</td>
<td>1.3%</td>
</tr>
<tr>
<td>(part of) course of colleagues</td>
<td>6.3%</td>
</tr>
<tr>
<td>Interactive games</td>
<td>45.1%</td>
</tr>
<tr>
<td>Other</td>
<td>34.0%</td>
</tr>
<tr>
<td>Total (n)</td>
<td>537</td>
</tr>
</tbody>
</table>

Note: The options digital tool and non-digital study book are left out, because these options were not included in all three runs.

It appears that teachers use different practices for different types of resources. All four types of reuse are present. Most emphasis is on the use of resources from third parties without adaptations, which accounts mostly for articles, videos, study books and pictures. Resources from third parties with adaptations is most often focused on (part of) courses made by colleagues or third parties. Easier to develop resources, like assessments, exercises and presentations, are most often self-developed without reuse.

A closer analysis of the differences in reuse between the three runs gives the results in Table 4. A χ²-test on the differences revealed a significant difference in reuse between the two runs ICT and Nursing (χ²(3) = 11.68, p<0.05). Analysis shows that teachers from ICT apply more reuse of learning material from third parties than those from Nursing. An explanation for this might be the greater awareness of reuse by teachers in ICT, fed by their programming practices where they massively reuse and adapt open source software.

A closer analysis of the differences in practices of reuse and the teaching experience gives the results in Table 5. A χ²-test on the differences revealed a significant difference in reuse dependent on teaching experience (χ²(9) = 31.19, p<0.05). Further analysis of the data shows that teachers with an experience < 2 years make more use of existing materials. A possible explanation is that 32 of the 34 teachers from this group are in a team teaching the course (94%). Being less experienced,
they most likely will mainly use the learning materials from their (more experienced) colleagues. In contrast, teachers with an experience of >10 years are more likely to develop their learning materials (with and without reuse of material from third parties) than teachers with less experience. A possible explanation is that they have created and gathered these learning materials during their career as a teacher and thereby created their own library of learning materials.

Table 4: Origin of learning materials (%) in Nursing and ICT

<table>
<thead>
<tr>
<th>Origin</th>
<th>Nursing (n=830) (N=116)</th>
<th>ICT (n=394) (N=74)</th>
<th>NL (n=889) (N=124)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have developed this material myself and have not or hardly reused material from third parties</td>
<td>23.3%</td>
<td>19.3%</td>
<td>33.0%</td>
</tr>
<tr>
<td>I developed this material myself and mainly reused material from third parties</td>
<td>12.3%</td>
<td>7.6%</td>
<td>12.1%</td>
</tr>
<tr>
<td>I have got this material from third parties and did not make any adaptations to it myself</td>
<td>41.6%</td>
<td>44.2%</td>
<td>37.1%</td>
</tr>
<tr>
<td>I have got this material from third parties and have made adaptations to it myself</td>
<td>22.9%</td>
<td>28.9%</td>
<td>17.8%</td>
</tr>
</tbody>
</table>

Note: N= # respondents; n= # responses. The question was answered for each learning material they use, therefore n>N. The % is taken from N.

Table 5: Origin of learning materials and teaching experience

<table>
<thead>
<tr>
<th>Origin</th>
<th>Teaching experience</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-2 years (n=233) (N=34)</td>
</tr>
<tr>
<td>I have developed this material myself and mainly reused material from third parties (e.g. by mixing learning material from third parties)</td>
<td>11.6%</td>
</tr>
<tr>
<td>I have developed this material myself and have not or hardly reused material from third parties</td>
<td>16.3%</td>
</tr>
<tr>
<td>I have got this material from third parties and did not make any adaptations to it myself</td>
<td>45.1%</td>
</tr>
<tr>
<td>I have got this material from third parties and have made adaptations to it myself</td>
<td>27.0%</td>
</tr>
</tbody>
</table>

Note: N= # respondents; n= # responses. The question was answered for each learning material they use, therefore n>N. The % is taken from N.

Measure of access to resources

Respondents were asked to whom the learning materials they used were accessible. The results show that most resources are only accessible for persons within the own institute (see Table 6).
Only a small proportion is available for a select group of people while resources like videos (48.4%), articles (50.0%), digital courses of a third party (45.2%), and pictures (41.0%) are available to all.

Table 6: Measure of access for used resources (%), combined for all three runs

<table>
<thead>
<tr>
<th>Resources</th>
<th>Institute</th>
<th>Private group</th>
<th>Unlimited access</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentations</td>
<td>82.2%</td>
<td>12.2%</td>
<td>2.4%</td>
<td>3.1%</td>
</tr>
<tr>
<td>Exercises</td>
<td>79.2%</td>
<td>13.3%</td>
<td>4.5%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Videos</td>
<td>35.8%</td>
<td>8.1%</td>
<td>48.4%</td>
<td>7.7%</td>
</tr>
<tr>
<td>Pictures</td>
<td>40.1%</td>
<td>10.1%</td>
<td>41.0%</td>
<td>8.8%</td>
</tr>
<tr>
<td>Articles</td>
<td>24.7%</td>
<td>18.3%</td>
<td>50.0%</td>
<td>7.0%</td>
</tr>
<tr>
<td>Assessments</td>
<td>84.0%</td>
<td>10.4%</td>
<td>4.3%</td>
<td>1.2%</td>
</tr>
<tr>
<td>(part of) course of 3rd party</td>
<td>30.1%</td>
<td>9.6%</td>
<td>45.2%</td>
<td>15.1%</td>
</tr>
<tr>
<td>(part of) course of colleagues</td>
<td>70.3%</td>
<td>14.3%</td>
<td>4.4%</td>
<td>11.0%</td>
</tr>
<tr>
<td>Digital studybooks</td>
<td>47.7%</td>
<td>24.2%</td>
<td>20.1%</td>
<td>8.1%</td>
</tr>
<tr>
<td>Interactive games</td>
<td>50.0%</td>
<td>18.3%</td>
<td>25.0%</td>
<td>6.7%</td>
</tr>
<tr>
<td>Other</td>
<td>42.0%</td>
<td>18.0%</td>
<td>34.0%</td>
<td>6.0%</td>
</tr>
</tbody>
</table>

Note: The options digital tool and non-digital study book are left out, because these options were not present in all three runs.

Teacher’s awareness and volition of reuse

Only in the NL run the awareness of teachers on open was measured with a question on open licenses. Main goal was to examine whether teachers consciously examine whether resources are open. The result show that most teachers in run NL (n=124) are familiar with open licenses (79%), but that only around a third of this group (almost) always check the open license when reusing resources. These results, as visible in Table 7, show that familiarity with open licenses is relatively high, but a correct attitude when reusing learning materials is relatively low (~35-40%) and independent of whether materials are adapted or not.

Table 7: The percentage of teachers that check on open license (n=97)

<table>
<thead>
<tr>
<th>Reuse</th>
<th>Check on open license when reuse (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(almost) always</td>
</tr>
<tr>
<td>With adaptations</td>
<td>39.2%</td>
</tr>
<tr>
<td>Without adaptation</td>
<td>35.4%</td>
</tr>
</tbody>
</table>
In the NL questionnaire, we also explored teachers’ volition to reuse resources (see table 8). Teachers’ main reasons are to gain new ideas (77.4%), as it is efficient (69.4%), and because the resources are of high quality (60.5%). In contrast, policy is hardly mentioned as a motivation to adopt OER (5.6%).

<table>
<thead>
<tr>
<th>Volition</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
</tr>
<tr>
<td>As a source of inspiration and to gain new ideas</td>
<td>96</td>
</tr>
<tr>
<td>Efficiency (time gain)</td>
<td>86</td>
</tr>
<tr>
<td>The resource is of high quality (e.g. from a reputable institution)</td>
<td>75</td>
</tr>
<tr>
<td>As a means to realize a desired pedagogical design</td>
<td>55</td>
</tr>
<tr>
<td>As an addition to the mandatory resources</td>
<td>52</td>
</tr>
<tr>
<td>The resources are from a colleague that I trust</td>
<td>48</td>
</tr>
<tr>
<td>It is the policy at our institute / faculty</td>
<td>7</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
</tr>
</tbody>
</table>

Discussion and conclusion

To be able to fully reach the potential of OER in the Netherlands, it is of importance to gain more insights into the current state of reuse. Therefore, the aim of this study was to analyze the current state of reuse by teachers. We analyzed which resources are used by teachers, how they are adapted and to what extent these resources are accessible to others. The results are discussed in this section.

Origin and Access

In general, it is important to note, that the results show that the opinions on what can be considered learning materials are very diverse. This becomes especially clear when one looks at the materials mentioned under ‘Other’ that range from specific tools to online materials and webinar. This could be explained by the lack of a common definition of learning materials. The UNESCO Recommendation mentions in their definition of OER “… learning, teaching and research materials in any format and medium…” (UNESCO, 2020, p. 2–3), without any details of what is meant by learning and teaching materials and what the differences are between those two terms. The definition of OER by the William and Flora Hewlett Foundation describes (open) educational resources as “… include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge” (Weller et al., 2015, p. 1). To develop support and policies for reuse of learning materials, a more precise definition is necessary to assure the full spectrum of learning materials is covered.

The origin of resources differs for the different types of resources. Resources for which development is hard or time-consuming (like videos, study books and pictures) are most often reused from third
parties without adaptations. It is not surprising that access to these resources is often unlimited, since these resources are already made available online by third parties. Resources that need to be more context specific or are on specialized subjects are created by teachers themselves. These resources are mainly presentations, assessment and exercises. Access of these resources is most often limited to the own institution. Our results on the limited access to resources by others, is in line with the findings of Rolfe (2012). She stated that local sharing is more common than the formal way of sharing. This can be considered as evidence that dark reuse is a common practice in higher education in the Netherlands.

**Awareness and Volition**

Even though most teachers in the NL run were familiar with open licenses, only a third of this group examines the license when reusing resources. A correct attitude regarding reuse is limited. While recent research suggests that awareness of OER is increasing (Seaman & Seaman, 2020), this does not automatically suggest that formal, proper reuse might increase as well. It could be that resources are reused or shared without proper attribution, which will only increase to the amount of dark reuse. While it might be quicker and easier for teachers to use resources without checking how to properly refer to the original resource, it is important to stress the consequences of doing so. It does not only lead to not rewarding the author of the resource for its work, but also an increased risk to receive an institutional claim on improper use of copyrighted materials form the Dutch organization ‘Stichting Pro’ (n.d.).

When we examined teachers’ volition to adopt OER, it showed that it is often a source of inspiration or that it is efficient to reuse. This might explain somewhat why most teachers reuse without checking the license. A striking result is that policy is hardly a motivation of teachers to adopt OER. This could mean that there either is no (open) policy at the institution, the policy is unknown to the teacher or that it provides no source of motivation. While for some institutions an OER policy has been a starting point to increase adoption (Schuwer & Janssen, 2018), other institutes might increase adoption from a more bottom-up approach.

**Dark Reuse**

Based on our results, it is very likely that dark reuse might be more prevalent than official adoption of OER. Whereas previous research indicate that limited adoption could be explained due to teachers’ lack of awareness, our results show that even if teachers are aware of open licenses, checking the licenses before reuse is not self-evident. We could therefore conclude that although it might appear that teachers do not or limited adopt OER as made clear in recent research in the Netherlands (Baas et al., 2019; Schuwer & Janssen, 2018), teachers might actually engage more often with OER than the numbers might suggest. This conclusion is in line with the findings of Beaven (2018) who stated that most OER practices are “hidden and take place in private spaces”.

**Limitations and Future Research**

Although the results of this study gain insights into the amount of OER reuse, there are also some limitations to this study. First, the findings are based on quantitative self-reports of teachers. Although this has some downsides, this was a conscious decision since we wanted to explore teachers’ behavior regarding reuse across more than one instance, as suggested by Beaven (2018). However, follow-up studies must explore reuse with a more qualitative research design in order to explore how these hidden practices look like and how teachers and students benefit of it. Second, some small changes
were made in the questionnaire over the runs due to feedback we got from the participants. This resulted in some slight differences and although we accounted for that in the results, it is important to note that the three runs are not fully comparable. Future research could explore whether it is possible to design a basic questionnaire that could be set out longitudinally among teachers to analyze reuse.

Concluding Remarks

Our goal is to update the data available about reuse in the Netherlands, especially since this study showed that dark reuse might be prevalent. We will do this by creating a so-called OER reuse hub, similar to the OER Research Hub (n.d.) of the OU UK (http://oerhub.net). Here institutes can find research instruments, outcomes, more information about OER or get in touch with experts. The current version of the questionnaire and the dataset are already available at Schuwer & Baas (2020) (https://doi.org/10.17026/dans-zz9-bang). Hopefully, this will be a start to gain more insights into reuse behavior among teachers and effects of measures to increase effective reuse.

References


OER Research Hub (n.d.). Oerhub: Researching Open Education. Available at http://oerhub.net


Papers are licensed under a Creative Commons Attribution 4.0 International License

*Open Praxis*, vol. 12 issue 4, October–December 2020, pp. 527–540
Impact of OER in Teacher Education

Denise Cummings-Clay
Hostos Community College/CUNY (USA)
dcummings-clay@hostos.cuny.edu

Abstract

The purpose of this research study, which employed a quantitative research design, was to determine if there was a difference in the grades achieved by students who were enrolled in an entry-level Foundations of Education course using Open Educational Resources (OER) versus the grades achieved by students who used textbooks in other course sections. The goal was to find out whether OER was of the same or higher quality as textbooks in our minority-serving higher education institution. The outcomes revealed that there was no significant difference in grades for course sections that used OER when compared to course sections that used textbooks. Thus, it can be concluded that OER were as good as the textbook usage. The study was conducted at Hostos Community College (HCC), a two-year college of City University of New York (CUNY). CUNY is comprised of 25 campuses across the five boroughs in New York City, USA.

Keywords: Open education, open educational resources, distance education, teacher education, early childhood education, technology in the classroom

When reflecting upon how academic content is dispensed to adults, Open Education is a relatively new marvel. At the time of this research study, the arena of Open Educational Resources (OER) reflected in the literature, benefits including cost effectiveness, accessibility of academic content, enhancement of andragogy, student engagement via a flipped classroom, and advancement of student learning. The author’s goal was to help students reduce their expenses in purchasing textbooks and the idea that OER could achieve this goal was intriguing. However, when the author’s Early-Childhood Education Department at an urban community college was part of a consortium of three institutions awarded a shared $300,000 Achieving the Dream (AtD) grant and financed in the Spring of 2016 (DiSanto et al., 2019), the author was skeptical of OER curriculum development. One of the author’s major aims was to ensure that the OER chosen for courses was robust and cutting edge. With the financial resources to develop OER for all courses, the Education Department plunged into the challenge of converting the usage of Teacher Education textbooks in all courses to OER.

The Foundations of Education textbook used in the study traditionally was reviewed from samples provided by textbook publishers like Pearson, Cengage, etc. and selected by the faculty based upon criteria such as relevant topics related to the course, clarity in text, usage of visuals, robustness, and user-friendliness. The OER materials utilized in the course were selected by faculty from the public Open Education domain based upon similar criteria for selection of a hard copy textbook. A distinguishing feature of the OER is its digitized format resulting in improved accessibility in all teaching modalities. Moreover, the usage of the OER is at no cost to the student.

As a college community striving to reach a 50% graduation rate by 2021-2022, it was hoped that the proliferation of OER would help students reduce their costs, thereby mitigating one of the factors that often delays graduation—a lack of funds. It was also anticipated that OER would level the academic playing field because all students would have access to academic content on the first day of class—no more waiting for the secondhand book to come from another state or students using earlier editions that may be worn, damaged, or incomplete (DiSanto et al., 2019, p. 229).
This research study evolved from the premise that OER usage might not be as good as textbook usage, although it was accessible to all students on the first day of class. The author believed that the findings of the study were important to uncover, as it was believed that the findings at the author’s higher education institution would provide the empirical evidence to support OER usage versus textbook usage or oppose OER usage.

**Review of the Literature**

OER is defined as “teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use and re-purposing by others” (William and Flora Hewlett Foundation, 2013 n.p.). OER include full courses, course materials, modules, textbooks, streaming videos, tests, software, and other tools, materials, or techniques used to support access to knowledge (Fischer et al., 2015; William and Flora Hewlett Foundation, 2013). David Wiley expounded on the notion of the consent allowed to an educational resource through an open license:

The term ‘open content’ describes any copyrightable work (traditionally excluding software, which is described by other terms like ‘open source’) that is licensed in a manner that provides users with free and perpetual permission to engage in the 5R activities:

1. **Retain** – the right to make, own, and control copies of the content (e.g., download, duplicate, store, and manage)
2. **Reuse** – the right to use the content in a wide range of ways (e.g., in a class, in a study group, on a website, in a video)
3. **Revise** – the right to adapt, adjust, modify, or alter the content itself (e.g., translate the content into another language)
4. **Remix** – the right to combine the original or revised content with other open content to create something new (e.g., incorporate the content into a mashup)
5. **Redistribute** – the right to share copies of the original content, your revisions, or your remixes with others (e.g., give a copy of the content to a friend) (Bliss & Smith, 2017).

Faculty and higher education institutions must determine whether OER usage is a worthy alternative to textbook usage in the 21st century. It has been a practice for colleges and universities to use textbooks in courses as academic content (Fischer et al., 2015). Professors usually assign the textbook as the major instructional material for a class (Fischer et al., 2015). “Students are obligated to purchase this book and use it to study the material in preparation for each class period” (Fischer et al., 2015, p. 160). Obviously, the textbook has a cost associated with its purpose. However, when OER is used, there is zero cost associated with its usage.

**Textbook Cost & The Shift to OER**

From a conventional perspective in the United States, textbooks have been a vital feature of the post-secondary learning encounters of most students (Fischer et al., 2015). However, the cost of textbooks has spiraled beyond the reach of many students from lower socioeconomic backgrounds, producing inequities in access to learning materials (Fischer et al., 2015). College textbook prices increased about 6% annually since Academic Year 1987-1988 (Silver et al., 2012). “The rising cost of textbooks may disproportionately harm students in community colleges, where tuition is generally lower and students may face greater financial difficulties” (Hilton et al., 2014, p. 68).
This was concerning to the author as the author’s higher education institution is a community college located in one of the poorest counties in the nation. The findings of a longitudinal study focused on high school graduating seniors indicated that persons of lower socioeconomic statuses were more apt to postpone college enrollment (Provasnik & Planty, 2008). The study also conveyed that the graduating seniors who enrolled in college were more inclined to choose a community college than their peers who might be wealthy (Provasnik & Planty, 2008). Another research study’s findings indicated that 55% of community college students were from the two last quartiles for income contrasted with 38% of public four-year students (Bailey et al., 2005).

The cost of textbooks has been a topic discussed frequently by the faculty in the Teacher Education unit. The faculty recognized that textbooks were of excessive cost and taxing for students of limited means. Textbook costs were rising at two times the inflation rate (Lyons & Hendrix, 2014). To help with textbook cost in a Field Experience course, immediately before conducting this research study, the author developed a comprehensive customized textbook to provide materials for students at a lower cost. Students seemed to be pleased with the textbook that was less than $90 for purchase and the reduced cost.

... data from countless surveys show that students will go to lengths in order to avoid the sticker shock associated with buying new textbooks in print: buying used books, renting semester-long access; sharing textbooks with classmates; pirating them online; and, with increasing frequency, going without access to textbooks (Lyons & Hendrix, 2014, pp. 262-263).

The faculty recognized that there was an increase in the volume of students who were not prepared for class assignments into the third and fourth weeks of class because they could not afford the textbook. Although a challenge initially, the decision to pilot OER in the Early-Childhood Education courses to level the playing ground for students became a primary aim.

Faculty cannot teach successfully in classroom environments, whether face to face or online, with increasing numbers of students who do not have access to required readings and other learning materials. There is a gap between the business models employed by textbook publishers and student expectations for access (Buczynski, 2007, p. 174).

The faculty determined that the usage of OER was a way to connect the gap. “Utilized in the classroom, OER can provide powerful tools for teaching and learning” (Hilton et al., 2014, p. 69). Furthermore, employing all-encompassing OER usage results in zero cost for each student (Hilton et al., 2014). “Students benefit from having course content available with zero costs and a wealth of resources available to them” (DiSanto, et al., 2019, p. 229).

**Non-Financial Benefits of OER**

**Accessibility of Academic Content**

One of the primary non-financial benefits of OER is making the academic content accessible from the first day of classes in a semester. In the Education Department, where the usage of the first OER was being piloted, the OER was uploaded in digital format in the course shells via the college’s Blackboard system. Thus, on the first day of classes, learners were able to access academic content and faculty could demonstrate to learners how to access the OER from the Blackboard system.
Accessibility was evident in a case study conducted to “understand how open licensed approaches are used within the Colleges of the University of London that contribute to the University of London International Programmes and explore any policies that are being applied” (Hatzipanagos & Gregson, 2015, p.96). A major advantage of OER revealed in the findings was the promotion of “digital resource access, availability and usage” (Hatzipanagos & Gregson, 2015, p. 102).

This advantage of providing learning materials to students free of charge on the first day of courses served as a major reason for the Education Department determining that converting to OER usage fully was worth pursuing. Using OER enabled faculty to create an environment that engaged students in the learning process immediately. Moreover, it took away an excuse that previously had been used—in the case of a learner who did not purchase a textbook due to unaffordability—that they were unable to read learning materials and/or do assignments because the materials were unavailable.

**Enhancement of Andragogy**

Another benefit of OER discovered is that it enhances andragogy. The term *andragogy* is described as the art of instruction of adults (Ross-Gordon, 2003). Malcolm Knowles, who is recognized for his work on andragogy, describes it as the art and science of helping adults learn (Knowles, 1984). Andragogy was first introduced in 1833 by Alexander Kapp, a German educator, to categorize learning approaches that focus on adults (Knowles, 1975).

A recommendation for classroom practice for adult learners in higher education is to foster relationships between academic learning and learning in the larger world (Ross-Gordon, 2003). Thus, an approach that faculty can use to facilitate adult learning is to create “opportunities within the classroom for students to make linkages between course content and knowledge gained in the contexts of work, family, and community living” (Ross-Gordon, 2003, p. 50). Adult learner access to OER provides the content to help adult learners build these connections. In practice, the author determined that these connections also could be created in Hybrid and online modalities.

**Student Engagement via a Flipped Classroom**

Another benefit of the OER featured as an advantage was its usage as a tool in a flipped classroom using team-based learning instructional strategies (Jakobsen & Knetemann, 2017). An example of this in this author’s experience is from Language Arts for Young Children, a course designated as Service-Learning by the college. Students were given access to OER materials on the first day of the course. Some of the OER academic content featured such topics as literacy, the tutoring process, and instructions on how to conduct a running record whereby learners could identify the reading level of a young child. Meanwhile, some class sessions were used to teach specific strategies to tutor a child that included direct instruction and time to practice the developing skill. In addition to the provision of additional academic content, learners gained experience tutoring young children in neighboring elementary schools with a resulting class assignment that assessed their volunteer tutoring service. Periodically, learners were asked focused questions regarding the OER. Exams were given to assess the outcomes of student learning and written assignments, focused on the tutoring experience, were given to document and assess reflective learning outcomes.

In the flipped classroom, students engage in the course material (i.e., OER) outside of the classroom permitting them to study the OER data at their personal speed (Jakobsen & Knetemann, 2017). “Rather than spending class time laying down the foundation, students are able to delve into a deeper understanding of the material” (Jakobsen & Knetemann, 2017, p. 177).
Advancement of Student Learning

Finally, a major benefit of OER featured as an advantage of its usage is that it advances student learning. In a study of the impact of OER use on teaching and learning, one conclusion drawn from a project was that “implementation of OER can improve student performance, but often indirectly through increased confidence, satisfaction and enthusiasm for the subject” (Farrow et al., 2015, p. 972). Other research on encounters with OER referenced the identification of improved learning as a potential benefit of OER (Hatzipanagos & Gregson, 2015).

Moreover, to strengthen the argument further regarding OER’s impact on student learning, the outcomes of some research studies indicating student success using OER were discovered. These studies focused on analyzing student learning outcomes when OER are substituted for traditional textbooks.

The studies, as noted in table 1, were cited in an article that provided a review of the literature of OER research by John Hilton, III (2016), a well-respected researcher of OER.

Table 1: Research Studies of Student Learning Outcomes Using OER

<table>
<thead>
<tr>
<th>College/Year</th>
<th>Study</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lovett et al. (2008) Online OER Component of Carnegie Mellon University</td>
<td>Measured the result of implementing an online OER component (2005-2006)</td>
<td>No statistically significant differences were noted.</td>
</tr>
<tr>
<td>Lovett et al.</td>
<td>Follow-up study (2007)</td>
<td>No statistically significant differences between traditional and online groups were noted.</td>
</tr>
<tr>
<td>Bowen et al. (2012) Six different undergraduate institutions</td>
<td>Extension of study just mentioned Note: largest of OER efficacy using randomization and comparisons of multiple learning outcomes</td>
<td>Students who used OER performed slightly better in terms of passing the course; differences were marginal and not statistically significant.</td>
</tr>
<tr>
<td>Hilton &amp; Laman (2012) Houston Community College</td>
<td>Study conducted in 2011</td>
<td>Students had a high GPA in the course, a lower withdrawal rate, and higher scores on the final exam; no analysis was performed to determine whether the results were statistically significant.</td>
</tr>
<tr>
<td>Feldstein et al. (2012) Virginia State University</td>
<td>Study conducted in 2010</td>
<td>Students using OER had better grades and lower failure and withdrawal rates; results had statistical significance, but the two sets of courses were not the same.</td>
</tr>
<tr>
<td>Pawlyshyn et al. (2013) Mercy College</td>
<td>Study conducted in 2012</td>
<td>Student learning outcomes appeared to increase; no statement of statistical significance was mentioned.</td>
</tr>
<tr>
<td>Hilton et al. (2013) Scottsdale Community College</td>
<td>Study conducted in 2012</td>
<td>Differences were not statistically significant</td>
</tr>
<tr>
<td>Allen et al. (2015) University of California, Davis</td>
<td>Study conducted to test the efficacy of an OER in a general chemistry class</td>
<td>Researchers found no significant differences between the overall results of the two groups.</td>
</tr>
</tbody>
</table>
Table 1: Continued

<table>
<thead>
<tr>
<th>Robinson (2015) Seven different institutions</th>
<th>Study examined OER adoption, the differences in final course grade, the percentage of students who completed the course with a grade of C- or better, and the number of credit hours taken</th>
<th>In five of the courses, there were no statistically significant differences in terms of final grades or completion rates; students in the Business course using OER performed significantly worse, and those in a Psychology course also showed poorer results.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fischer et al. (2015)</td>
<td>Follow-up research</td>
<td>In two of the 15 classes, students in the treatment group were significantly more likely to complete the course—there were no differences in the remaining 13.</td>
</tr>
</tbody>
</table>

Source: Hilton III, 2016

Rationale

The purpose of this research study was to look at the learning outcomes of students by comparing the grades of students who were enrolled in the college’s entry-level Foundations of Education course, housed in the Teacher Education unit’s Early-Childhood Degree Program at HCC, using OER versus the grades of students who used traditional textbooks in their course sections. The goal was to determine if there was a difference in the grades achieved by students who were enrolled in the entry-level Foundations of Education course using OER versus the grades achieved by students who used textbooks in their course sections.

Setting

This research study was conducted at HCC, a two-year college of City University of New York (CUNY). The college’s location is in the southern portion of Bronx, New York, which is one of the five boroughs in New York City and regrettably noted as the most impoverished in the nation. The Bronx is the northernmost of the five boroughs of New York City, within the state of New York. Geographically, it is south of Westchester County; north and east of the island and borough of Manhattan to the south and west across the Harlem River; and north of the borough of Queens, across the East River. Of the five boroughs, the Bronx is the only one that has the bulk of its area on the U.S. mainland and, with a land area of 42 square miles. In 2016, the Bronx had a population of 1,455,720, however, by 2019, the population decreased to 1,418,207 (Wikipedia, 2019).

College mission

The study was conducted in compliance with the community college’s mission, which is to offer people access to higher education leading to intellectual growth and socio-economic mobility through the development of linguistic, mathematical, technological, and critical thinking proficiencies needed for lifelong learning and for success in a variety of programs including careers, liberal arts, transfer, and those professional programs leading to licensure, like Teacher Education.
Methodology

Participants

The research study was conducted in the Early-Childhood Education Program, which included 431 participants or 6.2% of the student body. The study covered nine (9) course sections, two of which were OER. One OER section was online and the other section met face-to-face with the professor. Two textbook course sections met online while two others met face-to-face with a professor. The other three textbook course sections were hybrid.

The average age by course section revealed that the OER online section had an average age of 25 while the OER face-to-face section had an average age of 22. With respect to the distribution of majors by section, results showed that in the OER online section, there was a mixture of majors with Liberal Arts majors being the most. In the face-to-face section, students majoring in Early-Childhood Education and Liberal Arts made up the section, with the Early-Childhood Education being the most.

The degree progress by section showed that many of the students had attended the college for less than a year. The English Language Learner (ELL) status revealed that there were some ELLs reflected in the distribution of students, however, most students were non-ELLs. The gender by section was evident in showcasing females in the majority to males. Moreover, ethnicity/race by section (Fig. 1) revealed that Hispanics made up most of the classes, followed by African Americans or Blacks, Asians, Whites, and Unknowns.

During the spring (2017) when the research study was conducted, the HCC enrollment was 6,979; 3,855 or 55.2% of the students were full-time and 3,124 or 44.8% were part-time students. A total of 6,233 (89.3%) of these students were degree-seeking students, while 746 (10.7%) were non-degree seeking students. The enrollment consisted of 4,706 or 67.4% female students, and 2,273 or 32.6% were male students.
Looking at the diversity of the student body, the percentages in the ethnic/racial background reflected 1.7% White, 21.6% Black, 58.5% Hispanic, 3.3% Asian, 0.5% Native American, and 14.4% Other or Unknown. With respect to citizenship status, 69.1% were United States citizens, 20% were Permanent Residents, 2.4% possessed a Student Visa, and .1% had Temporary Visas.

In total, 431 or 6.2% of the student body participated in the study. Two of the nine course sections were OER, one online and the other, face-to-face with the professor. There were two textbook course sections that met online with two others that met face-to-face with the professor. The other three textbook course sections were Hybrid, meeting online half the time and meeting face-to-face with the professor the other half of the time.

**Research Design**

HCC awards letter grades to students to denote the level of achievement in each course. The grading system is displayed in table 2.

**Table 2: Grading System**

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Range</th>
<th>Quantity Point Value</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93-100</td>
<td>4.0</td>
<td>Exceeding Standard</td>
</tr>
<tr>
<td>A-</td>
<td>90-92</td>
<td>3.7</td>
<td></td>
</tr>
<tr>
<td>B+</td>
<td>87-89</td>
<td>3.5</td>
<td>Meeting Standard</td>
</tr>
<tr>
<td>B</td>
<td>83-86</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>B-</td>
<td>80-82</td>
<td>2.7</td>
<td></td>
</tr>
<tr>
<td>C+</td>
<td>77-79</td>
<td>2.3</td>
<td>Approaching Standard</td>
</tr>
<tr>
<td>C</td>
<td>70-76</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>60-69</td>
<td>1.0</td>
<td>Far Below Standard</td>
</tr>
<tr>
<td>F</td>
<td>Failure</td>
<td>0</td>
<td>Unacceptable</td>
</tr>
</tbody>
</table>

An analysis of grade distribution histogram was used to determine whether there was a difference in the grades achieved by students who were enrolled in the entry-level Foundations of Education course using OER versus the grades achieved by students who used textbooks in their course sections. The Grade Distribution Histogram (Fig. 2) shows that students who received A’s are represented by the color-gray; those who received B’s are represented by the color-blue; and those who received C’s are represented by the color-Carmel. To identify each section, Bar 1 is OER online; Bar 2 is Textbook online; Bar 3 is Textbook online; Bar 4 is Textbook face-to-face; Bar 5 (the middle bar) is OER face-to-face; Bar 6 is Textbook hybrid; Bar 7 is Textbook hybrid; Bar 8 is Textbook hybrid; and Bar 9 is Textbook face-to-face.
Results

The research outcomes (see Table 3) indicated that there were no significant differences found in the grades of students in the course sections using OER versus the grades of students who used textbooks across teaching modalities. These findings revealed that using OER had no adverse impact to student learning outcomes and the findings support the findings of other research studies cited previously in this article (Hilton, III, 2016).

Table 3: Research Outcomes

<table>
<thead>
<tr>
<th>ANOVA (Grade Comparison)</th>
<th>Mean Square</th>
<th>Significance</th>
<th>F-ratio (Difference among means)</th>
<th>df (Statistic for within groups)</th>
<th>T (Grade variance – standard of error)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.461</td>
<td>.388</td>
<td>0.748</td>
<td>1</td>
<td>0.229</td>
</tr>
</tbody>
</table>

Research Analysis

There was no statistically significant difference in the grades that were achieved by students in the course sections using OER versus the grades achieved by students who used textbooks. This outcome implies that students achieved comparable grades whether they used OER or textbooks. From the author’s perspective, the reasons why the study’s outcomes might have failed to see a great difference is that the OER was available on Day 1 of classes and the content of the OER seemed to be as robust as the textbooks previously used. Furthermore, the OER conveyed academic content in the same way for which textbooks dispensed scholastic materials.
It is crucial to note that in both the OER online and face-to-face course sections, the OER was made available to students via the campus Blackboard online technology system whereby students had immediate access to the academic content. The design of the OER online course section was comprised of OER-based content with student readings and viewing, in the case of videos, while the design of the face-to-face course section was comprised of the same plus reporting on this same content and role playing through skits using a team-based learning methodology in the classroom.

When looking specifically at OER course sections versus textbook course sections that were online or face-to-face, there was no statistically significant difference in the grades that were achieved by students in the course sections. This outcome implies that students achieved comparable grades whether they used OER or textbooks amidst the fact that the classroom modalities were similar.

It must be noted that the design in the textbook course sections is unknown, and the quantitative results did not reflect a measurement of professors’ teaching philosophy or methodologies employed in the classroom. Students were required to purchase textbooks in these course sections. The requirement might have caused a delay for a percentage of students to engage in the academic content due to high textbook costs and/or lack of student financial resources. Thus, the textbook online and face-to-face course sections might have had a delay in access to the academic content.

With respect to the OER course sections (online and face-to-face) versus the four textbook hybrid course sections, there was no statistically significant difference in the grades that were achieved by students in the course sections. This outcome implies that students achieved comparable grades whether they used OER or textbooks although they engaged the academic content online half the time and met face-to-face the other half of the time. Again, the design of the hybrid textbook course sections is unknown. Moreover, the research results did not include study of professors’ teaching philosophy or methodologies employed in the classroom. In this instance as in the textbook online and face-to-face course sections, students were required to purchase textbooks in these hybrid course sections. The requirement might have caused similar challenges as those that were textbook online and face-to-face course sections. It is not known, further, whether the design of the hybrid textbook online and face-to-face segments of the hybrid course sections included similar methodologies to the OER online and face-to-face course sections.

The analysis of variance (ANOVA) “is a statistical procedure that compares the amount of between-groups variance in individuals’ scores with the amount of within-groups variance” (Ary et al., 1996, p. 307). Specifically, the difference between two or more means can be tested via ANOVA (Ary et al., 1996).

The assumption underlying the ANOVA procedure is that if the groups to be compared are truly random samples from the same population, then the between groups mean square should not differ from the within-groups mean square by more than the amount we would expect from chance alone. Thus, under a true null hypothesis we would expect the F-ratio to be approximately equal to 1.0. On the other hand, if the null hypothesis is false, the difference among group means will be greater than what is expected by chance, so the mean square between will exceed the mean square within. In such cases, the F-ratio, the mean square between divided by the mean square within, will have a value greater than 1.0. (Ary et al., 1996).

With respect to this research study, the ANOVA was used to compare the grades in two OER course sections using online and face-to-face modalities versus seven textbook course sections that included online, face-to-face, and hybrid modalities. The ANOVA consisted of a regression analysis.
revealing that the test of significance in grades outcome had a mean square of 1.461 and indicating a significance of .388.

To determine whether the differences among the means were great enough to be statistically significant, or whether it was possible that they happened by chance, the F-ratio was computed. The F-ratio was 0.748. Since the F test statistic was less than 1, it can be determined that there was no statistical significance in variability among course sections. The degrees of freedom (df) statistic for within-groups was 1, which indicated that there was no statistical significance between course sections.

A t test was employed to determine any significance in grade variance. This was used because grades were the only sample drawn from each course section without other relationships between two groups (Ary, et al., 1996). There was no statistical significance since the standard of error was 0.229 as grades served as the only dependent variable used to measure any differences between OER course sections versus textbook course sections.

**Limitations**

Although this research study was important in determining the value of OER in a Teacher Education entry-level course, it failed to examine OER usage in each course of the Early-Childhood Education Program within the Teacher Education Unit. The examination of grades in nine course sections, two of which used OER, was constrained to a course-by-course analysis. In addition, this quantitative research study was limited in its scope in that it was unable to yield qualitative data like attitudes of students using OER versus students using textbooks or attitudes of students whose professors used OER as a tool in a flipped classroom format with purposeful requests of students to conduct additional research and/or requests for them to share personal learning outcomes related to knowledge gained from OER and linked to varied experiences.

**Conclusion**

The research findings revealed that using OER had no adverse impact to student learning outcomes. There were no significant differences found in the grades of students in the course sections using OER versus the grades of students who used textbooks across teaching modalities.

Thus, the author concludes that OER usage in all teaching modalities is optimum. The provision of learning materials for student usage free of charge is only one reason that OER is advantageous. The author is convinced that usage of OER in this technologically-focused era is cutting edge also due to its non-financial advantages like making the academic content accessible on the first day of classes in a semester; enhancing andragogy by using OER as a learning approach to help adults develop linkages between the OER and knowledge acquired in the family, at work, and in community settings; using OER as a tool in a flipped classroom whereby students engage in the course material (i.e., OER) outside of the classroom permitting them to study the OER data at their personal speed; and advancing student learning outcomes when the OER content is as comprehensive and robust as a hard copy textbook.

**Future Directions**

Studies are needed to replicate this research within Early-Childhood Education and in other disciplines. Furthermore, other aspects of OER usage need study. Examples include measuring attitudes of students using OER, looking at the textbook purchasing practices of students prior to the use of OER, or examining the attitudes of students who failed to buy required textbooks and are now using OER.
Research regarding the sustainability of OER in the CUNY educational system might be beneficial to all campuses in the CUNY system and other higher education institutions (Wiley et al., 2016). Both scholars and research investigators have dialogued about the prospects of sustaining the formation and distribution of OER (Dholokai et al., 2006; Wiley, 2006). Other research studies conducted recently have shown fiscal examples whereby more registrations generated new tuition income due to an institution’s OER usage that covered a surplus of the costs of publishing OER (Johansen & Wiley, 2011). Looking for successful models that support an institution’s OER usage is poor for learners if faculty fail to commit to its ongoing usage (Wiley et al., 2016).

While there are no content licensing costs associated with using open educational resources, there are several real costs that must be incurred by a faculty member or institution that chooses to adopt OER, including the costs of:

- Locating OER. There are well over half a billion openly licensed resources published on the Internet. At the time of this writing, a Google Advanced Search for the term ‘biology’ including only results that are licensed as being ‘free to use share or modify’ returned about 4,660,000 results. Finding the needle that appears to be relevant for a specific use case in this haystack can be time consuming.
- Reviewing OER. After identifying OER that appear to be relevant, these must be checked for quality, accuracy, accessibility, and other desirable attributes.
- Managing open license compatibility and attribution requirements.
- Effectively integrating OER into teaching and learning practices. The primary distinguishing attribute of OER is the broad range of copyright permissions granted by their licenses. Many faculty require additional training in order to understand the pedagogical opportunities afforded by these permissions. Many faculty also require additional training to use common online technologies effectively in their teaching.
- Integrating OER into campus technologies like learning management systems. Most OER are provided in one or more digital formats. In order to take advantage of the permissions granted by OER, faculty will need to move them into a local learning management system or other tool with both editing and publishing capabilities. Many faculty require support in performing this initial tool with both editing and publishing capabilities. Many faculty require support in performing this initial task as well as the eventual editing and localizing tasks (Wiley et al., 2016, p. 4).

When a higher education department determines to convert from the use of textbooks to OER, the higher education institution must identify how it will fund the necessary supports of its adoption (Wiley et al., 2016). For the author’s higher education institution, the AtD grant was secured to finance the adoption of OER in various educational departments on the HCC campus. Hostos Library faculty were instrumental in the professional development of faculty regarding OER creation and adoption processes from the start. The Library secured an additional grant to continue the processes of OER to maintain its usage. Thus, library and teaching faculty at HCC located and reviewed OER, and now manage the open license compatibility and attribution requirements. OER were integrated in the Teacher Education unit fully and were made accessible to learners through the institution’s learning-management system (i.e., the Blackboard system). Sustaining the use of OER has become an integral part of the author’s institutional operations. As an addendum to sustaining the fiscal support for OER, faculty are now developing protocols to update OER as part of their regular reflective practice activities as was done previously when textbook usage was the norm. In conclusion, additional research on the topic of OER
sustainability might provide insight into OER sustainability at HCC, CUNY, and other higher education institutions in future years.

References


Papers are licensed under a Creative Commons Attribution 4.0 International License
Student Perceptions of Textbooks: Prior Behaviors and Beliefs Can Influence Zero Textbook Cost (ZTC) Adoption Impact

AmberNicole Pfannenstiel, Alex Redcay & Daniel Albert

Millersville University (USA)
ambernicole.pfannenstiel@millersville.edu, Alex.Redcay@millersville.edu & Daniel.Albert@millersville.edu

Abstract

Many Open Educational Resource (OER) and Zero Textbook Cost (ZTC) studies explore cost savings, impact on learning outcomes, and student perceptions of the materials. While OER/ZTC research reports positive student perceptions (Brandle et al., 2019), textbook research reports negative student perceptions of digital textbooks (Behnke, 2018). This study explores student buying behavior and perceptions of textbooks, finding that perceptions toward the usefulness of materials is high when access to materials is high. Given this student perception, textbook purchasing is likely related to outside factors. This study adds to the growing body of research about how OER and ZTC may influence student costs and access to course materials, finding that student attitude toward course materials needs to be considered alongside adoption.

Keywords: Open Educational Resources, Zero Textbook Cost courses, Textbook Perceptions

Introduction

Textbooks remain a fundamental requirement in most college courses, where many instructors adopt commercial textbooks (CT), textbooks that are widely reported as expensive and becoming even more expensive. As cost of attendance continues to rise for students, faculty and institutional administrators have explored ways to integrate and adopt affordable learning materials. As part of these explorations, Open Educational Resources (OER) and Zero Textbook Cost (ZTC) courses have become mainstream ways of reducing some of the cost burden in individual courses.

OpenStax (2018) and OER Commons (2020) define OER as openly published, remixable materials like the textbooks and resources published by OpenStax and others. The key with OER is that the author or organization allows others to download and share, and in many cases edit, remix, and re-post. ZTC courses draw from openly published materials that may not be remixable, library books, library materials, and library accessed articles instead of a single textbook. ZTC utilizes free materials like websites, videos, government websites, school databases and more. These resources may be free to students, and most likely are accessible for a longer period of time, but these materials are not remixable and re-postable. In some cases, the ZTC textbook cost burden falls to the institutional library instead of the student.

Faculty and programs adopting OER and/or designing ZTC courses eliminate textbook costs for single courses, eliminate textbook costs for specific programs, and provide access to materials to students on the first day of classes. This study draws from a survey administered to OER and ZTC courses as part of a campus wide initiative to lower student textbook costs. The results presented here focus on how students understand the cost burden of textbooks, how cost and access impact their perceptions and attitudes toward course materials.
**Institutional Context**

During the Spring 2019, the OER working group at Millersville University, a northeast public master's-level university, developed and implemented an Open Textbook Initiative (OTI) to incentivize faculty to adopt OER in a course Fall 2019. The program partnered adopting faculty (16 faculty) with faculty, librarians, and an instructional designer (members of the working group) familiar with and using OER/ZTC in courses. This program focused on helping adopting faculty find OER/ZTC materials, mentoring adoption of OER/ZTC materials in courses, connecting instructional design to design courses with OER/ZTC materials. Adopting faculty were provided $1000 in professional development funds for adopting OER/ZTC materials for their course, completing a survey about their adoption experience, and distributing a survey to students enrolled in the OER/ZTC course.

The authors, members of the OER working group, designed the student survey loosely based on the COUP Framework (Bliss et al., 2013), to understand student reported perceptions of cost, use, and quality (perceptions) of the zero cost materials.

In the present study, we explore student reporting on their ability to pass a class without a textbook, and their textbook accessing (purchasing and opening) behaviors. The purpose of this initial investigation is to raise some of the complicated issues surrounding textbook access, issues that may impact student access behaviors when assigned OER and ZTC.

**Literature Review**

In a collection on textbook research, Fuchs and Bock (2018) introduce the goals of their edited collection, *The Palgrave Handbook of Textbook Studies*, claiming quite simply “textbooks matter”. Faculty adopt textbooks to function as pedagogical tools, serving as a means to provide course content to students. With the assigning of these textbooks, faculty not only adopt textbooks and materials that convey important content knowledge, but also knowledge on the values and ways of thinking prized within a given course (Fuchs & Bock, 2018). Complicating this, Behnke (2018) finds that US college students value the convenience of digital textbooks, but not the modality of those books (preferring print). Behnke (2018), citing Joo et al. (2014) argues that student attitudes toward textbooks are influenced by “student subjective norms relating to environmental variables, student self-efficacy, perceived ease of use, and perceived usefulness” (p. 390). No one, single, element influences student attitudes and beliefs, instead a combination of factors that include the wide category of ‘environmental variables’ influence student perceptions of textbooks.

The research in this study started in and is influenced by conversations surrounding OER and ZTC adoption in courses. The survey results reported here come from an instrument designed by the authors, and influenced by the research related to cost, use, outcomes, and perceptions (COUP), a framework highlighted by Bliss et al. (2013). In building our survey to understand aspects of the student experience with OER and ZTC materials in our institutional context, we see complicated connections to students’ perceptions of, attitudes toward, textbooks more broadly, attitudes that impact their purchasing and accessing behaviors (as reported by Behnke, 2018; Fuchs & Bock, 2018).

Bliss et al. describe costs as the student and instructor perception of textbook costs, use as the student use and accessing of the OER textbook in the OER/ZTC course, and perceptions as self-reported perceptions of quality comparing OER to commercial textbooks (CT). Using the COUP framework to understand the existing research, this study draws from the Behnke and Fuchs and Bock research to probe the intersection of the cost, use, and perceptions categories to continue to understand student use of textbooks, and OER/ZTC materials.
Drawing from OER/ZTC research, overall student cost savings is often a driving force of campus-wide initiatives in support of faculty designing zero textbook cost courses. Campuses report large cost saving amounts, such as Hilton et al. (2014) report on student cost savings across two semesters at 8 institutions. Additionally, numerous studies have investigated student perceptions of textbooks, textbook costs, and textbook usage (see Hilton, 2016 and 2018 for reviews; Martin et al., 2017).

Cost research also focuses on semester costs, money spent by students (Hilton, 2018). Perceptions research explores student and instructor perceptions of quality (Bliss et al., 2013; Hilton, 2018, Lin, 2019). Outcomes research explores the impact on learning outcomes (Fischer et al., 2015; Croteau, 2017; Clinton & Khan, 2019). Other studies report positive impact on grades, including lowering DFW rates (Colvard et al., 2018). These studies focus heavily on the student and instructor perceptions of textbooks in the OER/ZTC/CT classroom, with comparisons and connections to course learning outcomes, comparison and connections to overall student textbook costs.

Recent research draws on both perceptions and outcomes, Brandle et al. (2019) report on student perceptions of ZTC courses and student's ability to access course materials. The researchers note that "the importance of instructors modelling how to access, read, and annotate digital materials cannot be overstated" (p. 96), finding that student learning benefits from focused attention on building digital material use skills.

Katz (2019) explored cost from a new perspective, the time students spend finding bargains for the textbooks required in courses. This exploration of the student experience of purchasing textbooks found that 43% of the students surveyed spent more than an hour textbook shopping, with many students waiting until late in the semester to purchase textbooks as they had found not all faculty use and reference the 'required' textbooks.

The amount of time spent on finding textbooks often "detracts from time they are able to spend on other responsibilities" (Katz, 2019, p. 17). Further, Katz finds that students respond by making choices in their spending on textbooks, impacting their access to textbooks. Katz argues that OER and ZTC materials can reduce the time spent, and positively impact access. Extending this further, do student attitudes about textbooks impact their accessing behaviors? Connecting Behnke, do any of the environmental variables and perceptions of usefulness stem from the time spent finding the sources? While OER and ZTC materials could reduce the time spent searching for the best textbook deal, is student accessing of course materials also impacted by the attitudes toward textbooks developed through many semesters of avoiding purchasing textbooks or spent stressfully searching for these textbook deals?

In the present study, we expand discussions of student perceptions of textbooks costs and student perceptions of textbook use to understand if ZTC course materials are impacted by the perceptions student already have of textbooks, if student perceptions of ZTC materials are impacted by their perception of their ability to pass a course without a textbook. To connect to and extend the research, this study first asks about student spending behavior (RQ1), then student attitudes about course materials (RQ2), finally student reported access to materials and how that corresponds to their attitudes about textbooks (RQ3 and 4).

As faculty who have adopted OER and ZTC materials, we know our textbook decisions have student financial impacts, cost matters and is an important consideration. We also want to begin to understand how perceptions of textbooks might impact student access behaviors, and how that could impact student accessing OER and ZTC materials when assigned.
Methodology

Purpose

The purpose of this study was to examine the relationship between Zero Textbook Costs (ZTC) resources, their ability to access and attitudes about the usefulness of textbook/class materials. The full student perception survey is openly available in the University Digital Repository: https://millersville.tind.io/record/60401s. The study also examined how much students are spending on textbooks and if this interferes with their ability to obtain the materials.

IRB and Design

An expedited IRB application was approved by the University IRB in September 2019. Students were informed about the purpose of the study and were invited to provide their consent before data collection occurred. Data was deleted for students who did not consent to participation but completed the survey anyway. This study was non-experimental, cross-sectional, retrospective, and self-report.

Sampling and Data Collection

Students (N=1142) from 18 unique courses were invited electronically to participate in the study and 469 surveys completed which resulted in 41% response rate. There were 9 students that answered twice but for different courses so these students were left in the data. There were 7 students who answered twice for the same class but their answers were unable to be reconciled so they were left in the dataset. After the remainder of duplicate or blank entries were removed by listwise deletion, 442 students remained.

Materials Variable

Student attitudes were assessed by two questions regarding the (1) usefulness of textbooks or class materials to improve their grades or to (2) help them learn. Participants can respond with a 6-point Likert Scale with Strongly Disagree to Strongly Agree. Total scores ranged from 2 to 12 with higher numbers indicating a more positive view of textbooks usefulness. The materials total composite variable has excellent internal consistency (α = .91).

Pass Variable

Student attitudes were assessed by a single question regarding whether or not they can pass any class without the use of textbooks/materials. Participants can respond with a 6-point Likert Scale with Strongly Disagree to Strongly Agree. Scores ranged from 1 to 6 with higher numbers indicating a more positive view of textbooks usefulness and their inability to pass a class without them and lower numbers indicating student confidence that they did not need textbook/materials to pass any class.

Access Variable

Student access was assessed by two questions that asked about their access to all the required textbooks/materials: (1) I always purchase…(2) I have access…to all the required textbooks/materials. Participants can respond with a 6-point Likert Scale with Strongly Disagree to Strongly Agree. Higher scores indicated higher access with scores ranging from 2 to 12. The measure had adequate internal reliability (α=.74).
Costs Variable

Student perceptions of how cost impacted their access to textbooks was assessed by two questions: (1) Costs have led me to decline purchasing…, (2) I avoid paying for… all the required textbooks/materials. Participants can respond with a 6-point Likert Scale with Strongly Disagree to Strongly Agree. Higher scores indicated a higher likelihood that cost did not interfere with student purchase or accessing textbooks with scores ranging from 2 to 12. The measure had adequate internal reliability ($\alpha=.69$).

Results

RQ1: Was there a significant difference in how much students report spending in a typical semester versus a semester and spending in a typical class versus a ZTC course?

Paired sample T-Tests examined the difference between reported spending between a typical semester and this semester, then a typical class with the ZTC class. Students reported spending significantly less on textbooks this semester (M=200, SD=137) compared to previous semesters (M=290, SD=175) $t(440) = 14.2$, $p < .001$ and on textbooks for the ZTC class (M=8, SD=22) when compared to a typical class (M=89, SD=53) $t(437) = 30.2$, $p < .001$. Summary data for student spending behavior is displayed in Table 1.

| Table 1: How much do students report spending on textbooks? |
|---------------------------------|-------|-------|-------|-------|-------|-------|
|                                 | Min ($) | Max ($) | Mean ($) | Median ($) | SD ($) | N     |
| Typical semester                | 0      | 1000    | 290      | 275        | 175.2  | 442   |
| This semester                   | 0      | 800     | 194      | 200        | 137.4  | 441   |
| Typical class                   | 0      | 400     | 89       | 80         | 52.9   | 438   |
| ZTC class                       | 0      | 200     | 8        | 0          | 22.1   | 442   |

RQ2: Did student attitudes about materials impact how much they spent on textbooks?

Three MANOVAs with Tukey’s B post hoc analysis were completed to determine the impact of student attitudes on how much they paid for textbooks. Student attitudes about the usefulness of class Materials to improve their grades or to help them learn did not significantly impact how much they spent on course materials typically or this semester, typical classes or the ZTC course ($F(40,1568)=.638$, $p=ns$). Student attitudes about whether they can Pass any class without a textbook did not significantly impact how much they spent on course materials typically or this semester, typical classes or the ZTC course ($F(20,1666)=.785$, $p=ns$).

Student reports about their Access to course materials did not significantly impact how much they spent on course materials typically or this semester, typical classes or the ZTC course ($F(40,1646)=1.22$, $p=ns$). However, post-hoc tests were not able to be performed because one cell has too few cases. So the analysis was run a second time with the Access questions separately. The two access questions included: I always purchase or I have access to the course materials. None were significant except one post hoc. Students who reported that they agree ($$204=M$), strongly agree ($$210=M$), or disagreed ($$212=M$), with the statement, “I always purchase the required textbooks/materials” spent significantly more this semester when compared with students.
who reported that they strongly disagreed ($109=M) \ F(20,1646)=2.1, p<.01 \text{ with a medium effect size } (\eta^2=.06; \text{ power=.99}). \text{ A small effect size is } \eta^2=.01, \text{ medium effect size is } \eta^2=.06, \text{ large effect size is } \eta^2=.14.

**RQ3: Did student reported access to materials correspond to attitudes about textbooks/materials to improve their grades or to help them learn?**

ANOVA with Tukey’s B post hoc analysis was completed to examine the independent impact of students purchase and access to the course materials on their attitude about their usefulness. Students who reported that they strongly agree (M=10.02) with the statement, “I always purchase the required textbooks/materials were more likely when compared with students who reported strongly disagree (M=7.9) or disagree (M=8.37) to believe that textbooks were useful to improve their grades or to help them learn \( F(1,5)=5.44, p<.001 \text{ with a medium effect size } (\eta^2=.06; \text{ power=.99}). \text{ Data used for this analysis is displayed in Figure 1.}

In Figure 1, student perceptions of the usefulness of materials are compared with their self-reported textbooks/materials buying behavior. Student perceptions of the usefulness of materials is measured using the Materials Composite Score, where 2 represents the lowest and 12 represents the highest perception of the usefulness of materials. Error bars represent 1 standard error.

Students who reported that they strongly agree (M=10.1) with the statement, “I have access to the required textbooks/materials in all my courses (either by paying for it or getting it for free) were significantly more likely when compared with students who reported strongly disagree (M=7.8) or disagree (M=8.1) to believe that textbooks were useful to improve their grades or to help them learn \( F(1,5)=8.12, p<.001 \text{ with a medium effect size } (\eta^2=.09; \text{ power=.99}). \text{ Data used for this analysis is displayed in Figure 2.}
In Figure 2, student perceptions of the usefulness of materials are compared with their self-reported textbook/materials access behavior. Student perceptions of the usefulness of materials is measured using the Composite Materials Score, where 2 represents the lowest and 12 represents the highest perception of the usefulness of materials. Error bars represent 1 standard error.

Student access to materials and their opinions about the usefulness of materials are positively associated.

**RQ4: Did student beliefs about their ability to pass a class without textbooks influence their attitudes about the usefulness of textbooks/materials, whether they avoided buying them or if they had access to them?**

MANOVA with Tukey’s B post analysis was completed to determine if the statement, “I can pass any class without textbooks/materials” would impact student beliefs about the usefulness of Textbooks/Materials, led them to avoiding purchasing textbooks, or ensuring access to them. Overall the model was significant in that the attitude of I can pass any class without course materials significantly predicts their attitudes about the usefulness of course materials and predicts their access to the materials $F(5,425)=17.25$, $p<.001$ with a large effect size ($\eta^2=.17$; power=.99). The student attitude that they can pass any class without course materials significantly predicts their attitude about textbooks and their access behavior.

Students who strongly agreed ($M=10.8$) with the statement, “I can pass any class without textbooks/materials” were significantly more likely to think textbooks were useful than all other groups including students who strongly disagreed ($M=7.8$). Students who agreed ($M=9.7$) with the statement were also significantly different from those who slightly disagreed ($M=8.6$) and strongly disagreed. Students who slightly agreed ($M=9.6$) were also significantly different from those who strongly disagreed. Generally, students who thought that they could pass the class without textbooks still found them significantly more useful than other students. Data used for this analysis is displayed in Figure 3.
In Figure 3, student perceptions of the usefulness of materials are compared with their perceptions of the need to use materials to pass classes. Student perceptions of the usefulness of materials is measured using the Composite Materials Score, where 2 represents the lowest and 12 represents the highest perception of the usefulness of materials. Error bars represent 1 standard error.

Students who strongly agreed (M=10.8) with the pass any class statement also reported that they were significantly more likely to purchase and have access to course materials than all other groups including strongly disagree (M=9.1). Generally students ensured that they had access to the materials but they were not needed to pass the class. Data used for this analysis is displayed in Figure 4.
In Figure 4, student access to materials is compared with their perceptions of the need to use materials to pass classes. Student access to materials is measured using the Composite Access Score, where 2 represents the lowest and 12 represents the highest perception of the usefulness of materials. Error bars represent 1 standard error.

Students who strongly agreed (M=6.4) with the pass any class statement also reported that they were significantly more likely to avoid paying for the textbooks when compared to students who slightly agreed (M=7.9), slightly disagreed (M=8.1), disagreed (M=8.2) or strongly disagreed (M=8.2). Students who thought that they could pass any class without textbooks also tried to avoid paying for the materials.

Students who think that they can pass any class without textbooks still find the textbooks useful, ensure that they have access to textbook materials but try to avoid paying for them. Students who reported that they were able to pass any class without textbooks also reported that they thought the textbooks were very useful which seems to contradict what we might expect. One might assume that if a student believes that they can pass any class without a textbook would not find the textbooks useful. However, this is not true according to this data.

**Discussion**

OER/ZTC textbook initiatives are often trumpeted as being beneficial to students in two dimensions, dollars spent and access to learning materials. That is to say OER/ZTC initiatives save students money and have the potential to improve student learning by providing equitable access to learning materials. Cost savings potentially benefit all students, but students who had the means to pay for commercial textbooks before ZTC adoption will see greater cost savings than students who were not purchasing. This concept is visualized in Figure 5 where student typical semester spending on materials is plotted against their textbook spending during a semester when enrolled in a ZTC course. Data points below the data line are students spending less money in the ZTC semester than in a typical semester and the distance the data point is from the dotted line represents their cost savings.

These two dimensions have interesting overlap in that students who are likely to save the most money are the ones who previously had access to materials. Those students who are not spending much money on materials to begin with and are likely seeing smaller cost savings and are the ones more likely to now have access when the course adopts ZTC materials.

Figure 5 is a comparison of individual student semester spending on textbooks in typical semesters and a semester when enrolled in a ZTC course. Individual data points represent one student reported spending behavior. The dotted line is added as a visual to represent equal spending in typical and ZTC enrolled semesters.

Students enrolled in ZTC courses for this study report saving on average $75 - $96 on course materials. A savings of $75 is calculated when comparing the median typical semester materials spending with the ZTC semester materials spending. A savings of $96 is calculated when comparing the semester spending means. These savings calculations are consistent with other findings and numbers used by organizations like OpenStax (2018) for quantifying cost savings ($79.37) which is based on data from the 2015-16 National Postsecondary Student Aid Study by the National Center for Education Statistics (2018).

The variations in student spending on textbooks does not appear related to their attitudes about the utility of textbooks, their perception of their ability to pass classes without textbooks, or their general access to materials. Class material buying behavior also doesn't seem to be related to student attitudes towards the importance of the materials. Variations in textbook buying behavior are then likely related to other parameters such as student budget, major, or other factors. Again, returning to Behnke’s (2018) discussion of Joo et al. findings, the bigger influence on class material buying seems to be “environmental variables”, not “student self-efficacy, perceived ease of use, and perceived usefulness” (p. 390).
While the amount spent on textbooks shows no difference based on student attitudes about textbook utility, student material purchasing and access behavior is positively associated with their opinions of the usefulness of the materials. There are a number of ways that students can access the same course materials via a wide variety of mechanisms: purchasing, renting, borrowing from the library or friends, purchasing older editions of materials, or illegally pirating materials. Each of these different access mechanisms has various implications for student behaviors and long-term access differences. For example, students who share textbooks have access that is more limited than students who buy textbooks and the access for students who share textbooks likely disappears at the conclusion of the course. The positive association between student attitudes about textbooks and student access behavior implies either that students who find textbooks useful are already finding ways to access them, or students who access textbooks find them useful, or some unmeasured parameters influence the other two.

Our findings show a positive relationship between students reporting they can pass a class without a textbook and students finding textbooks useful. Seeing a positive relationship between student attitudes towards textbooks and their access to textbooks is worthy of further exploration to try to determine the directionality of this relationship. If student access to materials is causing them to have a more positive attitude towards the usefulness of materials, then providing more equitable access via ZTC initiatives has the potential to engage students more with learning materials which may positively influence student learning. However, if student attitudes towards materials are causing them to access materials more, then simply providing equitable access to materials is unlikely to get students who were not previously accessing materials to start utilizing materials. It is possible that students who want access to materials already have that access and so providing more equitable access will not change the amount that students access those materials if we do not also change student attitudes towards the usefulness of materials. At this time, this is an interesting finding, but incredibly complicated and needing further investigation. Due in part to limited study in textbook research (Fuchs and Bock, 2018), the possibility of intrinsic motivation, and the relatively small sample size of this study, further studies may or may not confirm this finding. We will continue to explore this positive relationship as we continue to engage with this survey.
We also probed student attitudes about the utility of textbooks by asking if they thought they could pass courses without the use of materials. Students who strongly believe they can pass courses without textbooks/materials avoid paying for the materials, but still are more likely to have access to the materials and find the materials useful. Even though students report that they avoid paying for materials if they believe they can pass courses without textbooks, the amount they spend on materials does not show the same association. This further shows that the amount students spend on materials is unrelated to their views on materials and is mediated by external factors. Student opinions about the necessity of using a textbook for passing a class provides interesting insight into the complex relationships students have with learning materials. Those who are more likely to access and see utility in learning materials also think they can pass courses without the use of those materials.

Simply providing access to materials without considering the complex relationships that students have already built towards learning materials could result in initiatives that are well intentioned but fail to produce large desirable impacts.

Study Limitations
All data collected is self-reported by students enrolled in a ZTC course during the Fall 2019 semester at a Regional Master’s Level Public University. The courses from which the study draws from are distributed amongst various academic disciplines and undergraduate levels, but these might not proportionally represent all classes taught at the University or distributions between course levels.

While writing this article, a global pandemic affected higher education (and the world). In some cases students were forced to return home, many might not have prepared for the extended break from campus leaving behind textbooks, or losing their access to materials when they lost access to the library. While our data was collected before this event, we discussed during data analysis in what ways this loss of access might impact student attitudes toward textbooks. We wondered if students enrolled in these OER or ZTC courses (designed by us and faculty in our program) lost internet access, therefore losing access to the free course materials digitally provided to them. While this is still an early exploration into student access and student attitudes, global events and campus events could impact the connections further. We think the complicated relationship illuminated by this data warrants further study including learning more about how and where students access materials to understand their perceptions further.

Conclusion
Initiatives that encourage faculty to adopt OER and ZTC materials hope to benefit students by reducing their costs and improving student learning via equitable access to learning materials. The COUP Framework developed by Bliss et al. (2013) is an important framework for understanding cost, outcomes, use, and perceptions. Better understanding how student attitudes and behaviors combine to influence the desired outcomes is crucial to how OER and ZTC programs are integrated with the student experience and what positive outcomes we can expect to see for individual students. We find that the average student clearly saves money when enrolled in a ZTC course, but the potential cost savings are drastically different for individual students based on the amount they were previously spending for textbooks. We also find that student access to materials is positively associated with their opinions about the usefulness of those materials, but the direction of influence for those two variables have very different implications for OER and ZTC programs that need to be explored.
Students enrolled in OER and ZTC courses often come into those courses with established behaviors and opinions about materials that are most likely shaped by their interaction with commercial materials. In order to realize the full potential of the impact of adoption of ZTC, it is critical to understand the complex relationship students have with materials and design interventions that help students engage and utilize the potential of equitable access.

Acknowledgements

This work would not have been possible without the financial support of the Provost and Deans at University. Additionally, the authors would like to thank the work of the Working Group for all their support of the various elements of the initiative projects like this require.

References


OER Commons (2020). *OER Commons & Open Education: The future of education, co-created with you*. Retrieved from [https://www.oercommons.org/about](https://www.oercommons.org/about)

Book Review of *Teaching and Learning with Technology: Pushing boundaries and breaking down walls*


Reviewed by: Ramesh Chander Sharma

*Dr B R Ambedkar University Delhi, New Delhi (India)*
rcsharma@aud.ac.in

**Introduction**

Technology has brought an immense amount of advancement as well as complexities in education. Across the world, educational institutions have been trying to establish culture as well as a system to facilitate the optimum use of resources. The University of South Pacific handles education of a diverse group of learners and has a very large and solid base in the region. The project and the subsequent documentation of the learning outcomes sound ambitious as well as a committed offering. The influence of Technology always carries the need to study its impact as well as the possibilities for improvement. As Prof. Som Naidu has pointed out in the preface about a debate of media versus method, this work seems to suggest a logical as well as an implementable model of teaching-learning with technology. Whether it is the influence of technology on learning or it is the counter-argument we can see that both the technology and the teaching-learning activities influence each other to a significant level.

**Structure and content**

There are 11 chapters in this book and all of them have got their agenda streamlined but these are not restricted in their vision as well as in their focus. While covering various challenges and issues in mobile and blended learning the team has also brought inputs about learning outcomes concerning two different contexts in online learning. Experts and pioneers, in the area of technology-empowered learning, say that technology changes the way we use it. The current book seems to bring out some valid and useful insights about the same. The media and the method are correlated and interdependent is what we see in the introduction itself. The concern is to make the methods successful enough to leverage the media. Because it is being referred to education and the teaching-learning process the primary focus is on the improvement of learning and teaching strategies. This makes this book useful to teachers, curriculum developers, elearning and mobile learning designers and researchers.
Overall impression and relevance to the field of distance education and e-learning

The 21st-century approach of project-based learning inspired and got support from the USP team when they experimented with the use of technology in teaching History. Checking the students out and making the new technology to understand history seems magical. Therefore 21st-century skills that students and even teachers need to possess – communication, collaboration, creativity and critical thinking will become double beneficial if collaboration helps them. We see the same in the research about teaching history using Technology. The fieldwork which was done to let the students be collaborative and the static nature of teaching history became engaging.

Chapter on evaluating students’ perceptions of blended learning has placed the First Things First. Because students are the actual users and flag-bearers of the technological goodness, they need to be asked and engaged at the very onset. Their response, as well as their reactions, seems to have guided this research in a good direction.

The development of an application which brought all the students together to understand history is great. The chapter ‘engaging with living histories’ is followed by a collaborative online reading with PERUSALL. Peer to peer learning in the form of online collaboration among students was accomplished in the Perusall LMS, as we noted that this is a tool to help and support online group based reading. This sounds great because reading has been pushed to the back seat and is being considered useless. The study has rejected the lack of interest among students as the motivation to bring ahead innovative learning.

One of the most significant and impressive inputs in the book is its recommendation of developing environments that encourage learning rather than running after the task to motivate learner. It says that if the learners will have the desire to study they will certainly engage in activities. Therefore, the teaching and learning with technology should focus on developing motivating learning environments.

The book discusses the formative assessment in large online classes. We see that the massive open online courses offered these days on various popular platforms also give an option of peer assessment where the fellow learners get the task as well as the option to review and assess the submissions made by their peers. Education is not challenged by Logistics or Technology alone, there may be the natural circumstances and the demography-cum-geography of the region. Needless to mention in detail that USP has enough to manage on this account. The haves and have nots are also been demarcated by nature. The chapter ‘It Rains A Lot Here’ talks about Mother Nature and the conduct of the online assessment amid nature’s challenges.

Supporting the flexible assessment of competencies with portfolios and another chapter titled researching learning and teaching technologies for flexible learning are also useful to understand how the complete teaching-learning phenomena have to be designed. The way these things are to be integrated and the way these things are to be used both these aspects have been studied.

There are different ways of delivering education since decades we have kept ourselves to pedagogy which is an instructive approach of teaching. Due to the lack of a holistic approach, this mode has been less productive. There have been two ways of delivering education known as Andragogy and Heutagogy. Both these approaches take us away from the Limited impacts of Pedagogy. As stated in this research, we get self-directed and flexible learning environments in these two approaches of teaching. Making the students aware of various needs and nuances in education, the chapter supporting the transition to tertiary level how students engage with academic literacy, is worth a read.

There is a very significant and unique chapter which talks about one of the most recommended and required aspects of modern education. That is inclusiveness. We know that technology should be used in education to bridge the gap between the have nots and the haves. To start working
for those who are differently-abled because of their physical limitations and ignoring the ones who face financial handicap will be killing what education means. This work keeps both the Financially challenged and Physically Challenged in view.

The project studies are not like the boring or stereotype passages after passages, rather the writers have written stories. This is an impressive way of telling the story of technology with the story-telling technique.

To sum up the review, I would put on record that this work is an excellent document to pave way for further betterment at the USP as well as the institutions that wish to follow the model. As placed in the title of the book - Pushing boundaries and breaking down walls – the book concludes successfully by taking this affirmation from the reader.

This book is published under a Creative Commons AttributionNoDerivatives 4.0 International License (CC BY-ND 4.0) and is available here: http://repository.usp.ac.fj/12032/1/

References

List of reviewers 2020 (volume 12)

In alphabetical order

Yavuz Akbulut, Anadolu University, Turkey
Maimoona Al Abri, George Mason University, United States
G. Anbalagan, Indira Gandhi National Open University, India
Prakash Arumugam, Wawasan Open University, Malaysia
Javiera Atenas, Latin American Initiative for Open Data, Universitat de Barcelona, Spain
Iresha Atthanayake, The Open University of Sri Lanka, Sri Lanka
José Luis Aznarte, Universidad Nacional de Educación a Distancia (UNED), Spain
Rebecca Yvonne Bayeck, The Pennsylvania State University, United States
Brandford Bervell, University of Cape Coast, Ghana
Glynis Bradfield, Andrews University, United States
Shawna M. Brandle, Kingsborough Community College, United States
Sandi Connelly, Rochester Institute of Technology, United States
Maricruz Corrales, Distance State University of Costa Rica, Costa Rica
Glenda Cox, University of Cape Town, South Africa
Daniel Domínguez, Universidad Nacional de Educación a Distancia (UNED), Spain
Lance Eaton, Brandeis University, University of Massachusetts and North Shore Community College, United States
Larisa Enríquez, Universidad Nacional Autónoma de México, Mexico
Robert Farrow, The Open University UK, United Kingdom
Tiberio Feliz, Universidad Nacional de Educación a Distancia (UNED), Spain
José Luis Fernández-Vindel, Universidad Nacional de Educación a Distancia (UNED), Spain
Caitlin Finlayson, University of Mary Washington, United States
Mehmet Firat, Anadolu University, Turkey
Alexander Gonzalez Flor, University of the Philippines Open University, Philippines
Manuela Amado Francisco, Instituto Politécnico de Leiria, Portugal
George Gyamfi, The University of Queensland, Australia
Richard Heller, People’s Open Access Education Initiative (Peoples-uni), Australia
Barbara Illowsky, Foothill-De Anza Community College District, United States
Maria Antonietta Impedovo, Aix-Marseille Université, France
Alberto Izquierdo, Universidad Nacional de Educación a Distancia (UNED), Spain
Rajiv Jhangiani, Kwantlen Polytechnic University, Canada
Shironica Karunanayaka, The Open University of Sri Lanka, Sri Lanka
Kjrsten Keane, SUNY Empire State College, United States
Hyasinta Kessy, The Open University of Tanzania, United Republic of Tanzania
Mitsuyo Koizumi, Hokkaido University, Japan
Angeliki Lada, National and Kapodistrian University of Athens, Greece
Janine Lim, Andrews University, United States
Beatriz Malik, Universidad Nacional de Educación a Distancia (UNED), Spain
Ana Katrina Tapire Marcial, University of the Philippines Open University, Philippines
Martha Pilar Mendez, Universidad EAN, Colombia
Javier Morentin, Universidad Nacional de Educación a Distancia (UNED), Spain
Ravi Murugesan, INASP, India
Tamil Selvan Muthusamy, Tamil Nadu Open University, India
Chrissi Nerantzi, Manchester Metropolitan University, United Kingdom
Irene O’Dowd, Hibernia College, Ireland
Dorothy Ofoha, National Open University of Nigeria, Nigeria
Judes Perera, The Open University of Sri Lanka, Sri Lanka
Paul Prinsloo, University of South Africa, South Africa
Kristen Radsliiff Rebmann, San Jose State University, United States
Laura Ritchie, University of Chichester, United Kingdom
Jen Ross, University of Edinburgh, United Kingdom
Mohsen Saadatmand, University of Helsinki, Finland
Thomas Salmon, Rhodes University, South Africa
Deborah Sanoto, Botswana Open University, Botswana
Francis Simui, University of Zambia, Zambia
Amando Jr. Singun, Higher College of Technology, Oman
Beatrice Somuah, University of Cape Coast, Ghana
Deepanwita Srivastava, Indira Gandhi National Open University (IGNOU), India
Adrian Stagg, University of Southern Queensland, Australia
William H. Stewart, Hankuk University of Foreign Studies, Republic of Korea
Matthew Stranach, Thompson Rivers University, Canada
Inge de Waard, Open University UK, United Kingdom
Naomi Wahls, University of Colorado Denver and Delft University of Technology, Netherlands

Papers are licensed under a Creative Commons Attribution 4.0 International License