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.

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This third Open Praxis issue in 2016 is an open issue that includes six research papers and one book review. If in our first editorial in 2014 we introduced our editorial process (Gil-Jaurena, 2014), in this occasion I would like to deepen in the role of the Editorial team and present our Editorial Board past and current members, partially renewed in July 2016.

Editor, a Consultative Editor and an Editorial Board compose the Open Praxis Editorial team. Dr. Inés Gil-Jaurena is the editor and Dr. Beatriz Malik is the consultative editor since 2011, when our editorial project (Gil-Jaurena & Malik, 2011) was selected by ICDE for the relaunch of Open Praxis as a scientific journal. We are associate professors at the Faculty of Education in the Universidad Nacional de Educación a Distancia (UNED) (National Distance Education University), Spain, and have worked together in various research projects and teaching initiatives.

In the composition of the editorial team, gender and geographical balance have been considered. All members belong to ICDE member institutions. Three of them are in the Editorial Board on behalf of the ICDE Executive Committee (currently Alan Tait, Yang Zhijian and Belinda Tynan; the latter has replaced Marta Mena in July 2016); the other four have been appointed among experts from ICDE member institutions in other regions. Thomas Mackey and Gangappa Kuruba have been members of the Editorial Board since 2013; Hemlata Chari and Joel Warrican have joined the Editorial Board in July 2016; and formerly Suresh Garg was a member from 2013 to June 2016.

Professor Alan W. Tait is Emeritus Professor of Distance Education and Development at the Open University, United Kingdom, and was Director of International Development and Teacher Education from 2013–2015. He was formerly Pro Vice-Chancellor (Academic) and Dean of Faculty. He has edited Open Learning, the European Journal of Distance and E-Learning (EURODL) and was founding Editor in Chief of the Journal of Learning for Development (JL4D).

Dr. Yang Zhijian is President of the Open University of China (OUC) since July 2010. Prior to that, he served as Deputy Director-General of the Higher Education Department of the Ministry of Education of China. He is also current President for the China Association for Educational Technology (CAET).

Professor Belinda Tynan is Deputy Vice Chancellor (Education) and Vice President at RMIT University, Melbourne, Australia since May 2016. She was Pro Vice-Chancellor at the Open University, UK, for 3 years. She has worked across a range of education sectors for 30 years and, over the past 8 years, she has been in senior executive roles in the areas of learning and teaching, quality and innovation. Her research is within the field of online and digital education with a keen interest in ‘openness’, staff workload and more recently learning analytics.

Thomas P. Mackey, Ph.D. is Vice Provost for Academic Programs at SUNY Empire State College, New York, USA. His research interests include metaliteracy, information literacy, open learning, and teaching with technology. He introduced the concept of metaliteracy with Trudi Jacobson in the article Reframing Information Literacy as a Metaliteracy (2011) and followed that piece with their book Metaliteracy: Reinventing Information Literacy to Empower Learners (2014). This team recently published a new co-edited book, Metaliteracy in Practice (2016).
Dr. Gangappa Kuruba is Senior Lecturer in the Faculty of Business, University of Botswana. He is presently working as Executive Assistant to the Vice Chancellor, University of Botswana. He has been working at this institution for the last 27 years in different capacities: Coordinator of Extension programmes, Head of Extra Mural and Public Education, and Acting Director at the Centre for Continuing Education. While working at this Centre he participated in various conferences and published on Distance Education.

Dr. Hemlata Chari completed her PhD from University of Alberta, Canada. She is presently working as Deputy Director- Academic, at the Institute of Distance and Open Learning-IDOL, University of Mumbai, India. In charge of Virtual Learning Centre and Study Material Unit. She supervises doctoral students; designs, develops and delivers course material; and peer-reviews for higher education and distance learning journals.

Dr. S. Joel Warrican is the Director of the Academic Programming and Delivery division within The University of the West Indies Open Campus, in Barbados. He is responsible for the planning, development and delivery of the online programmes offered by the campus.

From January 2013 to June 2016, two other scholars have been members of the Editorial Board, and we want to thank them for their contribution to the development of Open Praxis during this period.

Professor Marta Mena is Director of the Virtual Training Program for Researchers of the Secretariat of Science, Technology and Graduate Studies of the National Technological University (Universidad Tecnológica Nacional), Argentina. She was member of the ICDE Executive Committee until 2016 and member of the Open Praxis Editorial Board on behalf of it.

Finally, Dr. Suresh C. Garg has been Professor of Physics at Indira Gandhi National Open University, New Delhi, India, since 1993. He was former Pro-Vice Chancellor at IGNOU (2002–2006). He has recently retired from IGNOU.

The expected tasks as members of the Editorial Board are:

- Advocacy, promotion of the journal in their institution and professional networks
- Suggestion of additional reviewers
- Invitation to potential authors
- Advice in case of doubts in the acceptance of a paper
- Proposal for special issues

Also, Editorial Board members participate in the selection process of the ICDE Prizes for Innovation and Best Practice in Open, Distance, Flexible, Online Education and E-learning. The first edition took place in 2013 (Gil-Jaurena & Malik, 2013), the second one in 2015 (Gil-Jaurena & Malik, 2015) and the 3rd edition is expected in 2017, linked to the 27th ICDE World Conference to be held in Toronto, Canada.

Before joining the Editorial Board, some of its current members had contributed to Open Praxis in different ways: three of them had published in Open Praxis in its new stage: Tynan and James (2013), Tait (2014) and Warrican et al. (2014); and Hemlata Chari had been a reviewer in 2013 and 2015.

After this presentation, below an introduction to the contributions that compose this issue.

In the first paper, Mehmet Firat (Measuring the e-Learning Autonomy of Distance Education Students) focuses on the autonomy of students in distance education environments, analyzed with a scale that has been used in his institution, Anadolu University in Turkey. The scale is included in an appendix and the paper evaluates its validity and reliability, as well as the results once applied with a sample of students.
In the second paper, Aras Bozkurt, Nilgun Ozdamar Keskin and Inge de Waard (Research Trends in Massive Open Online Course (MOOC) Theses and Dissertations: Surfing the Tsunami Wave) review 51 master thesis and doctoral dissertations related to MOOCs to identify research trends in this area. They characterize them by analyzing the areas, methods and conceptual frameworks used in those academic works, providing an overview that complements other studies focused on reviewing scientific literature about MOOCs.

Also about MOOCs, Rebecca Bayeck (Exploratory study of MOOC learners’ demographics and motivation: The case of students involved in groups) presents a case study of the MOOC Creativity, Innovation and Change, which included voluntary group work; it is this particularity that is analyzed in the paper. She provides demographic data and studies the motivations for enrolment in the course. Even if the profiles don’t differ much from those identified by other researches, the author points to some findings related to group work.

Olga Belikov and Robert Bodily (Incentives and barriers to OER adoption: A qualitative analysis of faculty perceptions) analyze the perception about OER among US faculty, collected through an open question included in a larger survey. The categorization of the free answers leads to identify a set of drivers and barriers to OER adoption that are explained in the paper and exemplified with quotations from the respondents.

Also presenting a study on faculty perceptions and identifying barriers, Sujata Santosh and Santosh Panda (Sharing of Knowledge among Faculty in a Mega Open University) focus on faculty attitudes towards sharing knowledge. The survey-based study was developed at the Indira Gandhi National Open University in India and presents an outlook of the behaviours, trends and suggestions for improving the knowledge sharing culture.

In the last paper, Barbara Illowsky, John Hilton III, Justin Whiting and Jordan Ackerman (Examining Student Perception of an Open Statistics Book) compare students’ perception about open textbooks vs. traditional textbooks, through the study of the perception of users of a specific open textbook that had been updated and improved. The students were asked about quality and cost of the open textbook, and the paper provides insight to understand students’ perception about educational resources.

Finally, the issue includes a review by William Stewart of the book Learning Online: What Research Tells Us About Whether, When and How, published in 2014 in the USA.

We thank to the authors and the reviewers for their valuable contributions.

References


Measuring the e-Learning Autonomy of Distance Education Students

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Abstract
Previous studies have provided evidence that learner autonomy is an important factor in academic achievement. However, few studies have investigated the autonomy of distance education students in e-learning environments. The purpose of this study is to evaluate the e-learning autonomy of distance education students who are responsible for their own learning. For this purpose, as the first step of the study, an e-learning autonomy scale was developed. Analyses of the validity and reliability of the scale were carried out with the participation of 1,152 distance education students from Anadolu University, Open Education System. The scale has an internal consistency coefficient of $\alpha = 0.952$ and a single factorial model that explains 66.58% of the total variance. The scale was implemented with 3,293 students from 42 different programs. According to the findings, student autonomy in e-learning environments is directly proportional to level of ICT use but not affected by program or gender.

Keywords: Distance education; autonomy; e-learning; lifelong learning

Introduction
Based on computer and Internet technologies, e-learning has laid a strong foundation for the realization of continuous learning. The use of advanced communication technologies for learning purposes has improved the abilities of distance education systems to serve larger learner groups, offering richer content and faster service. The expansion of distance education has not only led to an increase in the diversity or saturation of the instruments that it uses but also improved its theory. In other words, these new learning environments have not only enhanced the means of learning, but they have also influenced our opinions regarding the nature of learning (Bates, 1997). Thus, there has been a worldwide paradigm change from a cognitive-behaviorist, progressive, systematic concept of learning towards a concept in which learning is continuous, lifelong and Connectivist and learner autonomy is emphasized (Anderson & Dron, 2010).

Autonomy is one of the most important factor of self-learning. And self-learning is vital for distance education students. Learners take action toward becoming lifelong learners when they take responsibility for their own learning. So, determining autonomy of distance education has a critical importance (Jacobs, Renandya & Power, 2016). According to Moore (1972, 1993), learner autonomy occurs when the person who sets learning objectives, has learning experiences and makes assessment decisions regarding a learning program is the learner rather than a teacher or instructor.

This study has two main goals. The first goal of the study is to develop a valid and reliable scale that can be used to determine the autonomy of distance education students in e-learning environments. The second goal of the study is to use the developed scale to analyze the autonomy of students in e-learning environments based on their programs of study, gender and ICT usage level.
Theoretical Background

Most learning theories stipulate the desirability of the learners’ acquisition of sufficient preparation, execution, and evaluation skills to conduct their own learning (Moore, 1972, p. 80). Precisely for this reason, after defining distance education for the first time, Moore (1972) discussed learner autonomy as the second dimension of independent learning. This is because in distance education, which is based on the idea that an individual will learn on his or her own unbounded by temporal and spatial restrictions, the learner is expected to benefit from the provided environment, tools and materials with his or her own self-control and free will (Andrade, 2014). Therefore, one of the indispensable learner competencies that is required for distance education is learning autonomy.

The notion of autonomy in education views the purpose of teaching as helping learners attain ideal individual learning behavior. This approach targets learner practice-focused, independence and responsibility as essential parts of all learning processes (Boud, 2012; Xu, 2013). According to Lynch and Dembo (2004), learner autonomy is a critical factor in successful online distance learning. Tschofen and Mackness (2012) discussed autonomy as one of the key principles of learning in connectivism. Additionally, Anderson and Dron (2010) found that the first task of Connectivist education involves exposing students to networks and providing opportunities for them to gain a sense of self-efficacy in network-based cognitive skills and the process of developing their own Internet presence.

The literature on learning autonomy offers various definitions for the term. These definitions include the ability to learn in a logical and appropriate manner (Holec, 1981), the capacity of a student to take control of his or her own learning (Benson, 2001), and the ability to function autonomously in self-directed learning and self-regulated learning processes (Loyens, Magda & Rikers, 2008). According to Betts (2004), an autonomous student is an independent and life-long learner. In its broadest sense, learner autonomy refers to a learner’s intervention in his or her own learning. According to Little (1991), to do this, the learner must have the capacity for critical reflection, decision making, and independent action. Lynch and Dembo (2004) defined five components of learner autonomy that are especially important for distance learner success. These components are motivation (self-efficacy and goal orientation), Internet self-efficacy, time management, study environment management, and learning assistance management. On the other hand, Arnold (2006) identified 11 factors that promote autonomy in the online environment: flexible access, learning facilitation, self-selection, a lack of face-to-face contact, media choices, community peer learning and dialogue, peer review, negotiated learning activities, self evaluation, evaluation of performance, and reflection on learning.

As a contemporary theory of intrinsic-extrinsic motivation that is built on the fundamental premise of learner autonomy, self-determination theory (SDT) argues that all humans have an intrinsic need to be autonomous in their environment (Deci & Ryan, 2011). Recent research (Chen & Jang, 2010 and Hartnett, 2010, cited in Hartnett, George & Dron, 2011; Andrade, 2014) has demonstrated that self-determination theory can be useful in the study of e-learning motivation. According to Hartnett et al. (2011), although only a few studies have adopted this framework, more have begun to emerge.

Related Literature

Studies in distance education indicate that learner autonomy is an important factor in determining academic success (Holmberg, 1995; Keegan, 1996; Peters, 1998; Jung, 2001; Kearsley, 2000; Lynch & Dembo, 2004; Yen & Liu, 2009). However, viewing learner autonomy as just a component of academic success does not explain how autonomous learners work in e-learning environments and how they effectively make use of their autonomy (Lynch & Dembo, 2004). Learner autonomy
or learner independence is a major contribution to success in e-learning environments in which learners are responsible for their own learning (Zimmerman, 2002). Learning autonomy plays an important role in achieving lifelong learning (Ariza & Sánchez, 2013). According to Zimmerman (2002), learner autonomy also contributes to the attainment of comprehensive educational goals such as improving life-long learning skills.

In a study conducted by Seiver and Troja (2014), satisfaction and success in online learning were analyzed as functions of belonging, autonomy, and expertise. Two studies have analyzed the relationships between motivation, satisfaction and online learning success. The results of these studies showed that the need for affiliation plays a significant role in a student’s satisfaction with his or her online learning experience, and the need for autonomy and mastery are less important; thus, the need for autonomy is not significantly related to students’ willingness to learn.

A study that was carried out by Hartnett et al. (2011) attempted to determine the learning motivations of teacher candidates studying in two online distance-learning environments. SDT was used as a framework. The study found that the learners were not primarily intrinsically motivated. Another study that was conducted by Scott, Furnell, Murphy and Goulder (2013) tried to determine teacher and learner opinions about learner autonomy in the field of biology. To this end, 28 teachers were interviewed, and 84 students were surveyed. The results showed that the number of years that were spent by the students in the university program did not affect their learning autonomy. Furthermore, it was found that learning autonomy was affected by personal and social factors rather than by other factors.

An analysis of the relevant literature found that learner autonomy has been researched intensively, especially in foreign language education (Holec, 1981; Benson, 2001; Furnborough, 2012; Kelly, 2014). Furthermore, various studies of learner autonomy have been performed in many different fields including psychotherapy (Holec, 1981; Kelly, 2014), emotional autonomy (Schmitz & Baer, 2001) and foreign language learning (Beck, Epstein, Harrison & Emery, 1983; Schwienhorst, 2012). While there have been studies in many fields, there has been a lack of studies on the learner autonomy of distance education students, especially those in e-learning environments. This gap has been frequently underscored in the relevant literature in recent years (Arnold, 2006; Macaskill & Taylor, 2010; Hartnett et al., 2011; Seiver & Troja, 2014). Due to this gap, many studies have even cited research on autonomy in foreign language learning (Aliweh, 2011). However, no scale exists for learner autonomy in general and for learner autonomy in e-learning environments in particular (Furnborough, 2012). Therefore, this study seeks to fill this gap in the relevant distance education literature and to provide a direct perspective on the autonomy of distance education students in e-learning environments.

**Method**

This study was conducted to determine the distance education students’ autonomy in e-learning environments. For this purpose, an e-learning autonomy scale was developed as first step of the study. Developed e-LAS scale used to analyze the autonomy of students studying in the e-learning environments as a function of their program, gender and ICT usage level as first step of the study. e-LAS scale designed as an online questionnaire to collect data from distance education students. Some important advantages of online questionnaires include their ease of storage, retrieval, and qualitative analysis (Murthy, 2008).
Participants

Distance education has students from all ages, professions and socio-economic groups. These features are important to generalize the research results because learners vary in their ability to exercise autonomy and autonomy varies from program to program (Moore, 2013). It is possible to analyze the participants in this study in two groups. The first group includes the 1,152 distance education students from Anadolu University, Open Education System who participated in the e-LAS scale validity and reliability analyses. These students were from 38 different programs (5 undergraduate and 33 associate degree programs) during the 2014–2015 academic year. The lowest rate of participation was from the Brand Communication program, with 12 students, and the highest participation rate was from the Business Administration degree program, with 305 students. The reason for this difference is the varying number of total enrolled students in these programs. Thus, the number of participants in the study parallels the total number of enrolled students in these programs.

The second group of participants includes those involved in the e-LAS scale implementation, which was composed of 3,293 students from 42 different programs (6 undergraduate and 36 associate degree programs) during the 2014–2015 academic year. Of the students who participated in the study, 36.4% were females and 63.6% were males. The students in the distance education system were asked a multiple-choice question with three options regarding how they rate themselves in terms of ICT use. According to the responses that were given by the students, only 8.2% see themselves at a basic user level, while 46.1% see themselves as medium-level users, and 45.7% think they are at an advanced level. This shows that the students who participated in the study see themselves as competent in the use of ICT.

Development of the e-Learning Autonomy Scale (e-LAS)

In the determination of the e-LAS scale items, these criteria by Moore (1972, 1993), Little’s (1991) autonomy skills, Lynch and Dembo’s (2004) five components of learner autonomy that are especially important for distance learning and Arnold’s (2006) 11 factors that promote autonomy in an online environment were all taken into account. Accordingly, some of the expressions that are utilized for the items on the scale are planning learning experiences, evaluating learning performance, determining learning goals, self-control of learning process, taking responsibility for decisions and assessment of learning needs.

Scale development in the social sciences involves formulating an item pool, soliciting expert opinions, conducting factor analysis and estimating reliability (DeVellis, 2012). In this study, an item pool was formed before the implementation, expert opinions were consulted, and a pilot study was conducted. The necessary permissions were obtained from the university administration for implementation. After the implementation, the validity and reliability were analyzed.

For the Turkish version of the e-LAS scale, an item pool was prepared based on the relevant literature. The item pool consisted of 15 items, 10 items were selected by following the suggestions of 3 field specialists. The field specialists were an associate professor of adult learning, an assistant professor of instructional technologies, and a distance learning specialist assistant professor. A draft of the scale form was made using the items that were suggested by the field specialists. The pilot study was conducted with 12 distance education students. As a result of this pilot study, one item was revised to make it more readable. Half of the items were negatively worded. Following each item was a five-point Likert-type scale of potential responses: strongly agree, agree, neutral, disagree, and strongly disagree. The participants checked the place on the scale that best reflected their feelings about an item. The maximum possible score on the scale was 50, and the minimum was 10. Translated e-LAS scale given in Appendix 1.
Data Analysis
The descriptive statistics of percentage (%), frequency (f), standard deviation (SD), and mean (X) as well as the parametric independent sample t-test and one-way ANOVA were used in the analysis of the data that were obtained from the application of the e-LAS scale to the distance education students. The statistical tests in the study were conducted using IBM SPSS 22.

Results
The findings regarding the two basic aims of the study are presented in this section. The findings are presented under two headings that correspond to each aim.

Analyses of e-LAS Validity and Reliability
The first goal of the study was to develop a valid and reliable scale that could be used to determine the autonomy of distance education students in e-learning environments. To this end, for the validity analysis of the e-LAS scale, several analyses were conducted in addition to the explanatory factor analysis. Based on the correlation matrix of the variables that were involved, a correlation factor analysis, which is a technique that requires a large sample size, was used. Tabachnick and Fidell (2001) provided a guideline on sample size: 100 is poor, 200 is fair, 300 is good, 500 is very good, and 1000 or higher is excellent. In this study, 1,152 distance education students participated in the e-LAS factor analysis application.

To determine how well the data from the distance education students matched the factor analysis, a Kaiser-Meyer-Olkin (KMO) value was calculated. Ranging between 0 and 1, the KMO value is normal between 0.5 and 0.7, good between 0.7 and 0.8, very good between 0.8 and 0.9 and perfect over 0.9 (Field, 2005; Sharma, 1996). Furthermore, the significant result of the Bartlett’s Sphericity Test was interpreted as good for the factor analysis of the sample size and the convenience of the correlation matrix (Field, 2005; Tabachnick & Fidell, 1996). As a result of the analyses, the KMO value was found to be 0.943, and the Bartlett Sphericity Test iχ2 value was found to be 10329.547 (p < 0.001). According to the obtained results, the data matrix from the work group was determined to be convenient for the factor analysis.

To determine the discrimination power of each item on the e-LAS scale in discriminating individuals, the item validity was analyzed. To this end, an item analysis that was determined according to each item score of the scale based on the lower 27% and upper 27% group median differences was conducted through an independent samples t-test. To determine the item discrimination of e-LAS, an item analysis was used. Maximum likelihood was used as the extraction method. The inter-item correlation was found to be r = 0.666. The item analysis findings are presented in Table 1.

Table 1: Results of Item Validity Analysis

<table>
<thead>
<tr>
<th>Items</th>
<th>Corrected Item-Total Correlation</th>
<th>Upper-lower 27% Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 1</td>
<td>0.773</td>
<td>( t_{(621)} = 19.775, p &lt; 0.001, MD = 1.41181 )</td>
</tr>
<tr>
<td>Item 2</td>
<td>0.802</td>
<td>( t_{(621)} = 19.139, p &lt; 0.001, MD = 1.36083 )</td>
</tr>
<tr>
<td>Item 3</td>
<td>0.790</td>
<td>( t_{(621)} = 21.140, p &lt; 0.001, MD = 1.51474 )</td>
</tr>
<tr>
<td>Item 4</td>
<td>0.744</td>
<td>( t_{(621)} = 20.504, p &lt; 0.001, MD = 1.44678 )</td>
</tr>
<tr>
<td>Item 5</td>
<td>0.758</td>
<td>( t_{(621)} = 20.811, p &lt; 0.001, MD = 1.44474 )</td>
</tr>
</tbody>
</table>
The analyses that are presented in Table 1 show that the t values for the 27% upper-lower group differences were significant at p < 0.001. This finding demonstrates that each item of the e-LAS scale has discriminatory power. The item total correlations ranged between 0.758 and 0.868. These findings suggest that the scale items have a high level of discriminatory validity.

To determine the factor structure of e-LAS, an explanatory factor analysis was conducted. The factor analysis was performed using the maximum likelihood and Varimax rotation techniques. The maximum likelihood analysis revealed one component with an eigenvalue of 7.28, which explains 66.58 percent of the total variance. The scale item loading on a single factor varied from 0.760 at the lowest to 0.869 at the highest. Loadings in excess of 0.71 are considered excellent (Tabachnick & Fidell, 2001). Because the e-LAS had such a strong single-factor structure, a confirmatory factor analysis was not conducted.

Reliability analyses were conducted using both the Cronbach’s α coefficient and split-half Spearman Brown for equal length methods to establish the internal consistency characteristics of the scale. The Cronbach’s α coefficient was used to determine the internal consistency of the scale, and the split-half method was used to find the internal stability. As a result of the internal consistency analysis, the Cronbach’s α coefficient was found to be α = 0.952 with p < 0.001. Additionally, all of the Cronbach’s α coefficients for item deleted values of 10 items were lower than 0.952. As a result of the reliability analysis that was conducted using the split-half method, the Spearman Split-Half Coefficient value of the test was found to be 0.919 with p < 0.001. These findings show that the e-LAS scale measured the autonomy of the distance education students in e-learning environments in a valid and reliable way.

The e-Learning Autonomy of Distance Education Students

The second goal of the study was to use the e-LAS to analyze the autonomy of students studying in the e-learning environments as a function of their program, gender and ICT usage level. For this purpose, various descriptive statistics and parametric tests were used. When the descriptive statistics of the student scores on the e-LAS scale were analyzed, the students had a high average (X = 37.97, Sd = 8.54). Considering that the maximum possible score on the scale is 50, this finding, which was obtained within the limitations of the study, indicates that the students who participated in the study have an adequate level of autonomy in e-learning environments.

Distance education of the University can be categorized as associate degree, undergraduate degree, completely distance (electronic environment), and internship requiring (face-to-face). Thus, to determine whether the program types (associate versus undergraduate degree and distance versus face-to-face) affected their degrees of autonomy in e-learning environments, these types were compared using an independent samples t-test. According to the results of the independent
samples t-test, no significant difference was found between the e-LAS scores of the students in the four-year undergraduate programs and those of the students in the two-year associate degree programs \( t(3291) = 0.71, p = 0.472 > 0.05 \). The autonomy of the students in e-learning environments does not statistically vary with the characteristics of their programs. However, because the program types and study methods differ, the e-LAS averages also varied.

The type of degree, i.e., undergraduate or associate, did not have a significant effect on the e-LAS averages. However, the e-LAS averages of the students that performed their coursework on e-learning platforms were higher than those of the students that studied in programs that required internships. Additionally, the e-LAS scores were compared by gender with the help of an independent samples t-test. This t-test showed that there was no significant difference between the e-LAS scores when compared by gender \( t(3291) = 1.79, p = 0.472 > 0.05 \).

The e-LAS scores were also compared by level of ICT use. For this purpose, a one-way ANOVA test was used. This analysis revealed a significant difference between the groups \( F(2,3290) = 40.657, p < 0.001, \text{MS} = 2897.45 \). To determine the differences between the various groups, one of the most common post hoc (multiple comparisons) tests, the Bonferroni test, was used. According to the multiple comparisons test, the e-LAS average of the students with advanced level ICT use was significantly higher than the e-LAS average of the students with medium level ICT use \( \text{MD} = 1.923, p < 0.001 \) and the e-LAS average of the students with basic level ICT use \( \text{MD} = 4.442, p < 0.001 \). Similarly, the e-LAS average of the students with medium level ICT use was significantly higher than the e-LAS average of the students with basic level ICT use \( \text{MD} = 2.513, p < 0.001 \). These findings indicate that, as ICT use of the distance education students increases, their autonomy in e-learning environments also increases.

**Discussion**

This study was conducted to accomplish two main goals. According to the first aim of the study, the e-LAS scale was developed, and validity and reliability analyses were conducted. After it was analyzed for its validity and reliability, the e-LAS scale was implemented with the distance education students. The relevant literature was also reviewed and used in the development of this e-LAS scale. The validity and reliability analyses confirmed that the e-LAS scale, which was comprised of 10 items with a 5-point Likert-type scale, was valid and reliable. The scale has an internal consistency coefficient of \( \alpha = 0.952 \) and a single factor structure that explains 66.58% of the total variance.

For the second aim of the study, the e-LAS scale was implemented with the students studying in the University distance education system. The autonomy of the participants in this learning environment was found to be high. This finding differs from Hartnett et al.’s (2011) finding that learners are primarily not intrinsically motivated. The students’ e-LAS scores were also compared based on program, gender, and level of ICT use. The analyses indicated significant differences based on level of ICT use. These findings demonstrate that the higher the ICT use of the distance education students, the higher their autonomy in e-learning environments.

Lynch and Dembo (2004) underscored the need to compare the autonomies of learners who take completely online, blended, less-structured or highly structured courses. Following this suggestion, in this study, the learning autonomies of students in associate degree, undergraduate degree, completely distance (electronic environment), and internship requiring (face-to-face) programs were compared, but no significant differences were identified. This finding supports that of Scott et al. (2013) who claimed that learning autonomy does not change depending on how many years a student has been enrolled in a university program.
Conclusions and Suggestions

The previous research analyzed the effect of learner autonomy on academic success and foreign language learning. This study, however, analyzes the autonomy of distance education students in e-learning environments. For this purpose, an e-LAS scale was developed. Validity and reliability tests determined that the e-LAS scale, which is comprised of 10 items with a 5 point Likert-type scale and has a single-factorial structure, explains 66.58% of the total variance and has an excellent internal consistency (α = 0.952). In this study, 1152 distance education students from 38 different programs (5 undergraduate and 33 associate degrees) participated in the development of the scale. Afterwards, the scale was implemented with 3,293 distance education students from 42 different programs (6 undergraduate and 36 associate degrees).

To accomplish the second aim of the study, the autonomy of distance education students in e-learning environments was analyzed using the e-LAS scale. The autonomies of the distance education students in e-learning environments were found to be high. The autonomy of the students does not vary with program or gender but is directly proportional to level of ICT use. Given the limitations of the study, the autonomy of the distance education students in e-learning environments can be said to be affected by ICT use. Consequently, to support the autonomy of distance education students in e-learning environments, it is necessary to increase their ICT literacy. As such, in terms of ensuring their autonomy in e-learning environments, the computer literacy, Internet literacy, and more broadly, the media literacy of the distance education students can be said to be very important.

Implications

As an important outcome of this research e-LAS can be used to determine the autonomy of distance education students in e-learning environments. Thus, the necessary precautions can be taken to support the autonomy of the students. The effect of ICT use on autonomy in e-learning environments were determined in this research. Improving students’ ICT literacy and technology use can support also the autonomy of the students. Especially, distance education students should be supported by training and courses in this regard.

Limitations and Future Research

This study was conducted to determine the autonomy of distance education students in e-learning environments and included the following limitations:

- the autonomy of distance education students in e-learning environments,
- the validity and reliability of the e-LAS scale were analyzed with 1,152 distance education students, and
- the implementation of e-LAS was conducted with 3,293 students from 42 different programs (6 undergraduate and 36 associate degree programs) in a University.

It is possible to suggest future researches by taking these limitations into consideration. In future studies, e-LAS scale can be used to determine the autonomy of different universities and countries distance education students in e-learning environments. For this, scale adaptation studies can be conducted. In the future researches the autonomy of distance education students and face-to-face students can also be compared in e-learning environments.
References


Xu, W. (2013). A New Interactive Method to Distance English Learning in Conceptual Age. *Open Praxis, 5*(4), 335–344. [http://dx.doi.org/10.5944/openpraxis.5.4.94](http://dx.doi.org/10.5944/openpraxis.5.4.94)


Appendix 1. e-Learning Autonomy Scale (e-LAS) *

| Instructions: Please read each of the following statements carefully. Next to each statements, select the number that represents how strongly you feel about the statement by using the following scoring system: Strongly Disagree (1), Disagree (2), Neutral (3), Agree (4) and Strongly Agree (5). |
|---|---|---|---|---|---|
| In e-learning environments . . . | 1 | 2 | 3 | 4 | 5 |
| 1- I plan my own learning experiences. | 1 | 2 | 3 | 4 | 5 |
| 2- I don’t evaluate my own studies. | 1 | 2 | 3 | 4 | 5 |
| 3- I don’t arrange environment for myself. | 1 | 2 | 3 | 4 | 5 |
| 4- I track my learning performance. | 1 | 2 | 3 | 4 | 5 |
| 5- I don’t take responsibility for my decision. | 1 | 2 | 3 | 4 | 5 |
| 6- I control my own learning process. | 1 | 2 | 3 | 4 | 5 |
| 7- I set my own learning strategy. | 1 | 2 | 3 | 4 | 5 |
| 8- I don’t determine my own learning needs. | 1 | 2 | 3 | 4 | 5 |
| 9- Decisions are not belong to me. | 1 | 2 | 3 | 4 | 5 |
| 10- I determine my own learning goals. | 1 | 2 | 3 | 4 | 5 |

*e-Learning Autonomy Scale translated from original Turkish language.
Research Trends in Massive Open Online Course (MOOC) Theses and Dissertations: Surfing the Tsunami Wave

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Abstract

Massive Open Online Courses (MOOCs) have attracted a great deal of attention by higher education and private enterprises. MOOCs have evolved considerably since their emergence in 2008, all the while given rise to academic discussions on MOOC impact, design and reach. In an effort to understand MOOCs more comprehensively, this study analyzes theses and dissertations (N = 51) related to MOOCs and published between 2008 and 2015, identifying research trends from these academic documents. Theses and dissertations within this research scope were gathered through a comprehensive search in multiple academic databases. For the purposes of the study, the research employed a systematic review approach. In order to reveal trends in research themes, emphasize theoretical/conceptual backgrounds, research designs and models, first a document analysis was used to collect data and this was followed by a content analysis. Our research findings indicate that MOOC research is generally derived from education, engineering and computer science, as well as information and communication technology related disciplines. Qualitative methodology linked to a case study research model is most common, and the theoretical/conceptual backgrounds are usually distance education related. Remarkably, nearly half of the studies didn’t benefit from any theoretical or conceptual perspectives. In sum, this study presents an evaluation regarding research trends derived from MOOC theses and dissertations, and provides directions for future MOOC research.

Keywords: Massive Open Online Courses; MOOCs; distance education; theses and dissertations; research trends

Introduction

Though the origins of the Massive Open Online Courses (MOOCs) can be traced back to early 2000s when open source, open access and open courseware movements appeared (Zawacki-Richter & Naidu, 2016), the year 2008 was a cornerstone for networked learning and MOOCs. Dave Cormier first coined the term MOOC to define connectivist learning on networks (Hollands & Tirthali, 2014). George Siemens and Stephen Downes facilitated the first (connectivist) MOOC in that same year (Siemens, 2013). Many other successful connectivist MOOCs followed one another. As a connected and open system, MOOCs caught a lot attention and were researched in open and distance education (de Waard et al., 2011, Bozkurt et al., 2015a). However, MOOC mania really took off when Sebastian Thurn facilitated the Artificial Intelligence (AI) MOOC which attracted 160K learners from 190 countries in 2011. This meant that the first generation connectivist MOOCs (cMOOCs), suddenly saw the rise of a second MOOC generation called extended MOOCs.
(xMOOCs). The rise of xMOOCs seemed unstoppable. In an article in the New Yorker, the President of Stanford, John Hennessy said, “There’s a tsunami coming” (Auletta, 2012, p. 71) and Daphne Koller, a professor of Computer Science at Stanford University and the co-founder of Coursera, responded by saying “The tsunami is coming whether we like it or not. . . You can be crushed or you can surf and it is better to surf” (McKenna, 2012, para.2). The authors of this paper believe that in order to surf on the MOOC tsunami, there is a need to map current state of art in MOOC research. In this regard, the purpose of this research is to present research trends emerging from MOOC theses and dissertations published from 2008 up to 2015.

MOOC Hype: It is real and here

Although MOOCs were first introduced in 2008, scientific knowledge about MOOCs is still at an early stage. Understanding why, how and through what processes MOOCs are used and by what means they affect their users, is still a big challenge. Being such a new phenomenon, one must wonder if all this hype is generated from their substantial contribution to the intellectual development, or if it is a result of a promise of new emerging technologies (Johansson & Frolov, 2014). In order to understand MOOCs’ maturity, adoption and application, each key event or development regarding MOOCs is identified and spotted by the authors Gartner Hype Cycle of key MOOC events (Figure 1). Key events such as Open Educational Practices, Open Educational Resources and first MOOCs were identified in Technology Trigger phase. First commercial MOOC platforms and the Year of the MOOC (Pappano, 2012) were identified in Peak of Inflated Expectations phase. Declaration of Anti-MOOC year (Watters, 2013) was identified in Trough of Disillusionment phase and described as sliding into the trough, while developments such as new type of hybrid MOOCs (Ross, Sinclair, Knox & Macleod, 2014; Bozkurt & Aydin, 2015) and increasing MOOC research (Liyanagunawardena, Adams & Williams, 2013; Gasevic, Kovanovic, Joksimovic & Siemens, 2014; Sa’don, Alias & Ohshima, 2014; Ebben & Murphy, 2014; Veletsianos & Shepherdson, 2015; Raffaghelli, Cucchiara & Persico, 2015) were identified in Trough of Disillusionment phase and described as Climbing the Slope. The year 2015 was spotted at the beginning of the Plateau of Productivity. MOOCs as a catalyst for higher education and MOOC evaluation were identified in Slope of Enlightenment phase. Plateau of Productivity phase wasn’t identified with any of the developments or events, yet considering the rapid progress of MOOCs, emerging business models, increasing educational adoption by higher education and millions of registered lifelong learners in pursuit of knowledge, it is believed that MOOC phenomenon is at the verge of the Plateau of Productivity phase and will enter this phase in near future.
This means that in contrast to criticisms and negative predictions made in 2013, interest in MOOCs is now evolving at an unprecedented pace, fueled by the attention given to high profile entrants like Coursera, Udacity, and edX in the popular press (Johnson et al., 2013). Besides, there is an increasing interest from lifelong learners, higher education institutions and for-profit platforms from 2012 onwards, which is also visualized in the Google trends for MOOCs (Figure 2). This pattern is quite similar to those reported by Liyanagunawardena et al. (2013), Ebben and Murphy (2014), Sa’don et al. (2014) and Raffaghelli et al. (2015). Since 2012, MOOC pedagogy has gotten increased attention with clear indications for its big impact on lifelong learning as concluded in the consequent Innovation Reports from the Open University, UK (Sharples et al., 2012; 2013; 2014).
State of the art of MOOC research trends

As an emerging phenomenon in online learning, MOOCs are like a massive research laboratory (Diver & Martinez, 2015). However, there is still a large gap in MOOC research (Saadatmand & Kumpulainen, 2014; Sinclair, Boyatt, Rocks & Joy, 2014; Loizzo, 2015). This has multiple reasons such as data protection concerns, a tendency to hoard data conspire to curtail data sharing, ethical hurdles for qualitative research (Esposito, 2012; Reich, 2015). In this regard, there is a need for a coherent research agenda (McAuley, Stewart, Siemens & Cormier, 2010) and in order to understand how we should design and develop learning for the future, we must first take stock of what we know and what has been well researched (Siemens, Gasevic & Dawson, 2015).

Currently the state of the art of MOOC research trends is as follows:

- The first study concerning MOOC research trends belongs to Liyanagunawardena et al. (2013) who conducted a systematic review of the published MOOC literature (2008–2012) and examined 45 articles.
- Gasevic et al. (2014) reported the results of an analysis of the research proposals submitted (266 submissions in phase one and 78 in phase two) to the MOOC Research Initiative (MRI) funded by the Gates Foundation and administered by Athabasca University.
- Ebben and Murphy (2014) performed a comprehensive search of nine leading academic databases and examined the initial phase of MOOC scholarship (2009–2013) and offered an analysis of these empirical studies that conceptualize themes in MOOC scholarship and listed them within a chronological framework.
- Sa’don et al. (2014) examined 164 papers by conducting a systematic literature review which is initiated using Data Mining and Knowledge Discovery Model where the database comprises state of the art research on MOOC ranging from 2008 to mid-2014.
- Kennedy (2014) reviewed six peer reviewed research articles describing the phenomenon of MOOCs in informal and postsecondary online learning between 2009 and 2012 and explored the characteristics associated with MOOCs which are revealed as varied definitions of openness, barriers to persistence, and a distinct structure that takes the form as one of two pedagogical approaches.
- Veletsianos and Shepherdson (2015) applied descriptive and inferential statistics to bibliometric data to investigate interdisciplinarity in MOOC research by examining MOOC research papers published between 2013 and 2015.
- Raffaghelli et al. (2015) examined 60 papers in terms of the methodological approaches most commonly adopted in the scholarly literature on Massive Open Online Courses (MOOCs), published during the period between January 2008 and May 2014.
- Sangrà, González-Sanmamed and Anderson (2015) examined 228 studies that focus on MOOCs published between 2013 and 2014 in peer reviewed journals.
- Veletsianos and Shepherdson (2016) reviewed 183 empirical MOOC paper published between 2013 and 2015 with a purpose to identify gaps in the related literature.

The above mentioned articles covered research papers, articles and proposals, however research on MOOCs should not be limited to these academic documents, which is where this study steps in.

Significance and rationale of the study

Grey academic literature, in this case theses and dissertations, are another important source of information to use while examining research trends. Theses are written for an MA degree and dissertations are written for a PhD degree. They are formal and lengthy scholarly publications.
required at the end of MA or PhD programs to earn these degrees. Further, theses and dissertations have a role as a means of creating, distributing and disseminating scientific information (Bozkurt et al., 2015b). Within this perspective—as a complementary study—this research intends to contribute to better understand MOOC literature. Understanding a discipline—namely MOOCs—on macro as well as micro levels, is partially possible through examining changes, dynamics, and perspectives in theory and practice in the research conducted in that particular field (Bozkurt et al., 2015b). It is also important to create a research agenda based on research trends to guide individual researchers, institutional groups, and regional, national and international agencies, associations, and other networks (Anderson & Zawacki-Richter, 2014) because understanding factors and the new dynamics in the field provides future researchers and practitioners with a comprehensive scheme of experiences, implications, practices, policies, programs, and perspectives.

**Aim of the Study**

This study analyzes theses and dissertations related to MOOCs and identify research trends by examining theses and dissertations in 2008–2015 period. By making the research trends visible, research gaps can be located, and future research can be planned to enable the shift from the Slope of Enlightenment to the Plateau of Productivity. Within this perspective, the research question for this study is as follows: What are the most employed research trends in theses and dissertations published between 2008–2015, while looking at research methods, research themes, research models/designs, as well as theories, concepts, frameworks and models.

**Methodology**

This follows a qualitative research design and uses a systematic review. Systematic reviews aim to identify, appraise and summarize studies of a particular topic (Webb & Roe, 2007) and are used to arrive at a more holistic, comprehensive and trustworthy outlook of the research topic (Gough, Oliver & Thomas, 2012). Systematic reviews provide guidance to researchers planning future studies, and provide convenient summaries of the literature on a particular issue (Petticrew & Roberts, 2008). In current MOOC systematic review research, the data collection and organization process employs document analysis while data analysis process employs content analysis approach.

Document analysis, is a social research method. It is an important research tool in its own right and is an invaluable part of most schemes of triangulation employed for data collection. In document analysis, different techniques can be used depending on the type of the document and purpose of the research (Heffernan, n.d.). Document analysis involves skimming (superficial examination), reading (thorough examination), and interpretation. This iterative process combines elements of content analysis and thematic analysis (Bowen, 2009).

Content analysis is not aligned to one methodological approach (e.g., qualitative or quantitative) and can be based on a variety of data types (Banks, Louie, & Einerson, 2000). It is a research method for making replicable and valid inferences from data to their context, with the purpose of providing knowledge, new insights, a representation of facts and a practical guide to action (Krippendorff, 1980). The aim is to attain a condensed and broad description of the phenomenon, and the outcome of the analysis is concepts or categories describing the phenomenon. Usually the purpose of those concepts or categories is to build up a model, conceptual system, conceptual map or categories (Elo & Kyngäs, 2008). Considering the aim of the study, summative content analysis is designated as an appropriate analysis approach to review and interpret MOOC research.
Sampling, Limitations and Strengths

This research sampled theses and dissertations published between 2008 and 2015 to reveal research trends. The authors employed purposeful sampling. The findings of the study are limited to theses and dissertations written in English, with online, full text accessibility, published from 2008 to 2015, and having one of the following definitions in the title: MOOC(s), Massive Open Online Course(s), cMOOC and xMOOC. The following databases were used: Google Scholar, ProQuest, Open Access Theses and Dissertations, WorldCat, Anadolu University database, Athabasca University database and Open University database. 51 documents met the sampling criteria and were included in this research (Appendix 1). This study's strength is that it is adding a base study for future research because it is the first study which examines theses and dissertations to identify trends in MOOC research.

Data Collecting, Procedure and Analysis

The 51 theses and dissertations were examined through document analysis to identify theses and dissertations relevant to research questions of the study. Following that, the documents were further investigated through content analysis. Sentences, paragraphs and sections are defined as coding units. Considering research questions of the study, a coding frame was developed and data were coded according to that frame.

Reliability

Research themes, research designs and research models, theories, concepts and frameworks that are explicitly reported in the theses and dissertations were included in this study. For a limited number of issues with regard to the theoretical background of the theses and dissertations, the first author interpreted and coded research findings into appropriate preset categories and the second author repeated the same process for reliability reasons. Cohen (1960) proposed that measurement of the agreement between two raters is calculated using the Kappa statistic. Accordingly, $\kappa = .9329$ $SE = 0.0656$ $95\% CI = 0.8044$ to $1.061$. According to Landis & Koch (1977), 0.81 to 1.00 refer to almost perfect agreement and Altman (1990) refers 0.81 to 1.00 intervals very good. Thus, it is thought that research findings can be considered as acceptable with a 0.9329 Cohen’s Kappa value.

Findings and Discussion

Quantitative Information: Of all the studies accessed, 45% is theses and 55% is dissertations (Figure 3). A similar pattern can be seen when looking at the frequency of the published theses and dissertations (Figure 4) in comparison to the MOOC Google Trends (Figure 2).
These findings confirm the findings of Liyanagunawardena et al. (2013) who reported that there is a very similar pattern in the number of MOOC related articles by publication years. It also coincides with Sa’don et al. (2014), and Ebben and Murphy (2014) who reported that by 2013, MOOC numbers boom. This finding emphasizes that the incubation period of the MOOCs is over and that MOOC focused academic research is increasing rapidly.

**Research Themes:** When the theses and dissertations were examined according to the disciplines they belong to, it is observed that 51% of the studies are related to education, 19% comes from engineering and computer science, 12% refers to information and communication sciences, 8% is related to business and economics, 6% links to social science, and only 4% to media disciplines (Figure 5). A detailed list of themes and disciplines is given in Appendix 2.
MOOC research trends reveal three separate research strands that align with findings from other researchers. Veletsianos and Shepherdson (2015), Liyanagunawardena et al. (2013) and Gasevic et al. (2014) reported that the MOOC research was primarily conducted in Education, Information Technologies and Computer Science disciplines. According to Veletsianos and Shepherdson (2015) multidisciplinary, interdisciplinary, and cross disciplinary research represent promising venues for studying digital learning. On the other hand, MOOC research is currently dominated by the discipline of education (Gasevic et al., 2014) which risks to limit MOOC research. On this ground, we state that there is an important need: MOOC research from other disciplines is needed to provide a sound research base and to create an in-depth understanding of MOOCs. Several research fields are also left underexplored. For instance, MOOCers constitute an online learning community (de Waard et al., 2011) and research from sociology discipline would contribute to MOOC research.

Research methodologies, designs and models: When theses and dissertations were examined in terms of research methodology, it is seen that of all the theses and dissertations, 49% is qualitative, 21% is quantitative, 18% is mixed, 8% review and 4% is other (not specific) research methodologies (Figure 6).
Findings regarding research methodologies used in MOOC theses and dissertations have a different pattern when compared to previous MOOC findings. While theses and dissertations used qualitative (49%), quantitative (21%), mixed (18%), review (8%) and other (4%) research methodologies (Table 1), Gasevic et al. (2014) reported that of all the research submissions to MOOC Research Initiative (N = 78), 42% was mixed, 33% was quantitative and 24% was qualitative. Raffaghelli et al. (2015) also reported that of all the articles they examined, 20% was mixed, 15% was quantitative and 12% was qualitative studies, 30% was theoretical-conceptual, 15% was not clear (in research design) and 8% was design based research.

Table 1: The most used research models in theses and dissertations

<table>
<thead>
<tr>
<th>Methodology</th>
<th>Model/design</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qualitative (49%)</td>
<td>Case Study</td>
<td>16</td>
<td>31,4</td>
</tr>
<tr>
<td></td>
<td>Content Analysis</td>
<td>2</td>
<td>3,9</td>
</tr>
<tr>
<td></td>
<td>Best Practices</td>
<td>1</td>
<td>2,0</td>
</tr>
<tr>
<td></td>
<td>Delphi</td>
<td>1</td>
<td>2,0</td>
</tr>
<tr>
<td></td>
<td>Discourse Analysis</td>
<td>1</td>
<td>2,0</td>
</tr>
<tr>
<td></td>
<td>Exploratory Qualitative Analysis</td>
<td>1</td>
<td>2,0</td>
</tr>
<tr>
<td></td>
<td>Heuristic inquiry</td>
<td>1</td>
<td>2,0</td>
</tr>
<tr>
<td></td>
<td>Narrative Study</td>
<td>1</td>
<td>2,0</td>
</tr>
<tr>
<td></td>
<td>Virtual ethnographic</td>
<td>1</td>
<td>2,0</td>
</tr>
</tbody>
</table>
## Methodology Model/design Frequency Percentage

<table>
<thead>
<tr>
<th>Methodology</th>
<th>Model/design</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantitative (21%)</td>
<td>Correlational</td>
<td>7</td>
<td>13.7</td>
</tr>
<tr>
<td></td>
<td>Cohort Analysis</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>Comparative</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>Experimental</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>Survey</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>Mixed (18%)</td>
<td>Explanatory Sequential Mixed Design</td>
<td>3</td>
<td>5.9</td>
</tr>
<tr>
<td></td>
<td>Exploratory Sequential Mixed Design</td>
<td>3</td>
<td>5.9</td>
</tr>
<tr>
<td></td>
<td>Convergent Parallel Mixed Design</td>
<td>3</td>
<td>5.9</td>
</tr>
<tr>
<td>Review (8%)</td>
<td>Literature review</td>
<td>4</td>
<td>7.8</td>
</tr>
<tr>
<td>Other (4%)</td>
<td>Other</td>
<td>2</td>
<td>3.9</td>
</tr>
</tbody>
</table>

Looking at the research model/design, the following frequencies occur (N = 51): case study is the most used research model (31%), followed by the correlational research model (14%), literature review (8%), explanatory design (6%), exploratory design (6%) and convergent parallel design (6%).

It is also salient that in addition to traditional data collecting tools such as questionnaire, interview and observation; new network based data collection tools such as social network analysis, user logs, internet and traffic ranks have started to be used in theses and dissertations. Considering the networked spaces as an ecosystem, it is promising to employ new data collection tools to be able to understand the structure of the networks and user behaviors on networked learning environments.

**Theories, concepts, frameworks and models:** There is a pattern in terms of employed theories, concepts, frameworks and models (lenses). Interestingly, 25 documents out of 51 didn’t employ any theoretical lens to explain MOOCs, which equals to 49% of all theses and dissertations. Cumulatively, this value constitutes 37% of lenses (N = 68). Most of the lenses listed in Table 2 are distance education or technology related theories and they generally have a focus on online learning communities and distance education learners. It is also surprising that, though fewer, some lenses come from business and economics discipline.

<table>
<thead>
<tr>
<th>Lens</th>
<th>F</th>
<th>%</th>
<th>Lens</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>25</td>
<td>36.8</td>
<td>Interaction Equivalency</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>Community of Inquiry (CoI)</td>
<td>4</td>
<td>5.9</td>
<td>Motivational Theory</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>Diffusion of Innovations</td>
<td>4</td>
<td>5.9</td>
<td>Musical creative self-efficacy</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>Self-Determination Theory</td>
<td>2</td>
<td>2.9</td>
<td>Network Value Added Approach of Business Models</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>Social Learning</td>
<td>2</td>
<td>2.9</td>
<td>Return on Investment (ROI)</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>Activity Theory</td>
<td>1</td>
<td>1.5</td>
<td>Self-Directed Learning</td>
<td>1</td>
<td>1.5</td>
</tr>
</tbody>
</table>

*Open Praxis, vol. 8 issue 3, July–September 2016, pp. 203–221*
These findings (Table 2) demonstrate a similarity to Gasevic et al.’s (2014) findings in terms of employed theories, concepts, frameworks and models. In our sample however, the focal points of related theories, concepts, frameworks and models were online learning communities, social learning, and distance education learner characteristics. These findings reveal that (1) MOOCs have strong ties with the discipline of education, which explains why so many researchers from the educational discipline try to understand MOOC phenomenon and (2) other disciplines still perceive MOOCs as an emerging, popular research trend which result in research without theoretical underpinnings.

**Further remarks:** Researchers of this paper observed that MOOC theses and dissertations between 2008 and 2015 period generally examined xMOOCs which is a contrast pattern when compared to Liyanagunawardena et al. (2013) who reported that most of the articles in their sample covered cMOOCs. It seems that majority of research initiatives is shifting towards xMOOCs, which might be due to the popularity of xMOOC platforms. This coincides with what Ebben and Murphy (2013) stated. They identified two key phases of scholarship about MOOCs, reported as:

- **Phase One:** Connectivist MOOCs, Engagement and Creativity 2009–2011/2012. Themes of Phase One include: Development of Connectivism as a learning theory, and technological experimentation and innovation in early cMOOCs.
- **Phase Two:** xMOOCs, Learning Analytics, Assessment, and Critical Discourses about MOOCs between 2012 and 2013. Themes of Phase Two include: the rise of xMOOCs, further development of MOOC pedagogy and platforms, growth of learning analytics and assessment, and the emergence of a critical discourse about MOOCs.
Conclusion and Future Directions

This research analyzed MOOC research trends distilled from theses and dissertations published between 2008–2015. Based on MOOC key events within the Gartner Hype Cycle, MOOCs are at the verge of Plateau of Productivity which means that there will increasingly be a diversity in MOOC applications in the future. Confirming this notion, some recent developments such as improved ID verification (recognizing typing patterns and submitting a valid ID with photo), diversity of types of the MOOCs (scheduled or self-paced), efforts to improve recognizability and accreditation (official verifiable certificates and specializations with signature track feature), increasing number of joint MOOC initiatives and partnerships among the MOOC platforms and universities provide some insights about the future of the MOOCs and its place in Hype Cycle.

This study found that MOOC research is generally dominated by education, engineering and computer science, and information and communication technology related disciplines. Qualitative methods are currently preferred, but there is an increasing interest for quantitative and mixed research design studies. As a natural consequence of MOOCs as an education dominated research area, theoretical grounds are usually distance education related. Remarkably though, almost half of the theses and dissertations didn’t use any theoretical framework.

This research serves as a complementary research by providing empirical research findings collected and discussed from a grey literature of MOOC studies, namely theses and dissertations. It is our hope that future MOOC research will focus on neglected research areas. Considering the findings of this research, the following implications may direct future research:

- Current research trends focus mainly on MOOC learners and MOOC systems within an educational perspective. Thus, there is a need to conduct research within different disciplines to increase the diversity of MOOC related research findings.
- Though in an increasing momentum—especially in 2014 and 2015—the number of mixed methods design is relatively low. More mixed method research might however eliminate possible weaknesses of qualitative and quantitative research design, and provide a more complete and comprehensive understanding of the MOOC phenomenon.
- Though at present there isn’t enough research to conduct a meta-analysis or meta-synthesis based study, such research would contribute significantly to MOOC literature.

Acknowledgement

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References


Zawacki-Richter, O., & Naidu, S. (2016). Mapping research trends from 35 years of publications in *Distance Education. Distance Education, 37*(3). http://dx.doi.org/10.1080/01587919.2016.1185079

### Appendix 1

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T: Thesis, D: Dissertation

**Appendix 2**

**Disciplines of theses and dissertations.**

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## Disciplines of theses and dissertations.

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<td>Engineering Physics</td>
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<td>Software Engineering</td>
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Exploratory study of MOOC learners’ demographics and motivation: The case of students involved in groups

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Abstract
This paper reports preliminary findings on students enrolled in a massive open online course, who were also assigned to work in groups. Part of a larger study on the effect of groups on retention and completion in MOOCs, the paper provides students’ demographics (i.e., location, gender, education level, and employment status), and motivation for taking the course. Findings show that women outnumbered men and that students mostly enrolled into the course because of a friend. Indeed, research on MOOCs demonstrates that men outnumber women and that educational pursuit and professional development are the main motivators for taking MOOCs. Yet, this paper shows that when group work is included in a MOOC, women participate more. Furthermore, for students assigned to groups in a MOOC, friends are the principal incentive for enrolling into the course. These results are discussed in light of previous research, and implications for teaching and learning in online environments addressed.

Keywords: MOOCs; demographics; motivations; group learning; gender

Introduction
Massive open online courses (MOOCs) are a recent trend in online or distance education, and research in this area is burgeoning. While some researchers argue that innovations such as MOOCs will disrupt higher education by causing some universities to disappear, or academic degrees to be replaced by MOOC completion certificates (Gregory, 2012; Schierenbeck, 2012), others contend that MOOCs do not present a threat to higher education sector (Kalman, 2014). In Kalman’s (2014) view, the fact that MOOCs currently cannot reach and provide support to underprivileged students in developing countries illustrate MOOCs’ inability to completely disturb higher education. In other words, MOOCs seem not diverse enough to include students from diverse background (e.g., education, gender, and employment).

Discussions on learners’ demographics and motivations for taking a course have been to some extent covered in MOOC research (Despujol, Turro, Busqueis & Canero, 2014; Guo & Reinecke, 2014). Research shows that MOOCs attract diverse students from different countries (Despujol et al., 2014). However, studies addressing participants’ demographics and reasons for enrolling in MOOCs integrating group work are rare. Understanding that MOOCs are “here to stay” (Cooper & Sahami, 2013), that group work positively affects performance and engagement in MOOCs (Kulkarni, Cambre, Koturi, Bernstein & Klemmer, 2016), and that MOOC learners are inclined to collaboration (Li et al., 2014), this paper purposes to describe the characteristics of MOOC learners assigned to group work. Thus, identifying characteristics of learners engaged in group work, and their motivations for taking the course can add to the literature on group work in MOOCs and can also give insights into how to enhance learning experiences and meet the learning needs of MOOC students working in groups.

The following literature review is divided into two areas: (a) demographics of MOOC learners in terms of gender, employment status and level of education and (b) motivation for enrolling into MOOCs. Taken together, the literature provides a rationale for the main research questions: What
are the characteristics of students participating in a MOOC online group work (i.e., gender, education level, and employment status)? And what motivates participants in this study to take the course?

**Literature review**

MOOC research shows that MOOC learners are diverse in terms of cultural background and country of origin, online experience, education level, employment status and in their reasons for enrolling in a MOOC (Dillahunt, Chen & Teasley, 2014; Guo & Reinecke 2014; Woodgate, Macleod, Scott & Haywood, 2015).

**MOOC learners’ demographics**

MOOC learners are in their vast majority college degree holders (Despujol et al., 2014; Ding et al., 2014) and employed (Macleod, Haywood, Woodgate & Alkhatnai, 2014; Dillahunt, Wang & Teasley, 2014). Indeed, Christensen et al. (2013) study reported that 83% of MOOC students have a post-secondary degree, 79.4% of students have a Bachelor’s degree or higher and 44.2% indicated a level of education beyond a Bachelor degree.

With regard to gender, males often constitute the majority of learners (Davis et al., 2014). Christensen et al. (2013) research showed that 56.9% of participants were males; and 62.4% were employed full-time or self-employed, while 13% were unemployed or retired. Despujol et al. (2014) found similar results: 56% of participants in their study reported male as their gender and 44% indicated to be female. Dillahunt, Chen et al. (2014) also noted that most participants in their study comparing learners who could afford to those who could not afford higher education were male (68.65%). Additionally, this research revealed that individuals who said they could not afford higher education had in their majority a bachelor degree, indicating that MOOC learners are not diverse when it comes to educational background. It should be mentioned here that the authors did not offer information related to participants’ employment status. Nevertheless, the authors revealed that individuals with some college degree or experience are the ones benefiting the most from MOOCs free access (Dillahunt, Chen et al., 2014). Christensen et al. (2013) equally discovered that learners in MOOCs are mostly males and employed. Nevertheless, studies discussing MOOC learners’ employment status are scarce and this may be explained by the fact that MOOCs are still relatively new (Clow, 2013).

However, when addressing gender disparities, Macleod et al. (2014) sustained that gender differences are related to the type of course taught. In terms of gender representation, gender differences in traditional education courses are replicated in MOOCs (Macleod et al., 2014). In other words, courses, fields, or majors such as science, technology, engineering, and math where women are underrepresented in traditional education will experience the same gap in MOOCs.

**Motivation for enrolling**

Learners frequently join a MOOC for educational pursuits, professional development, or to learn new things (Radford, Coningham & Horn 2015; Macleod et al. 2014). In their survey of MOOC students, Chang, Hung and Lin (2015) found that instructor’s suggestions, development of professional skills, and the possibility to explore areas of interest also motivated learners to participate in MOOCs. Belanger and Thornton (2013), in a pre- and post-course survey of MOOC students’ motivation for enrolling, identified the following: students enrolled to support lifelong learning or to gain an understanding of the subject matter with no specific completion or achievement expectations; students signed up for fun, entertainment, social experience and intellectual stimulation; students enrolled for convenience often because of barriers to traditional education options; and students also registered to explore or experience online education.
Investigating the reasons why students take MOOCs, Christensen et al. (2013) also revealed that advancing in a current job and curiosity were the main reasons explaining students’ enrollment into MOOCs. However, the reason for joining MOOCs was also dependent on the type of course offered. For instance, 74.6% of students who took humanities courses (e.g., poetry, or music) were driven by curiosity and 11.9% took these courses to improve their job performance (Christensen et al., 2013). For the social sciences MOOCs, 54.1% enrolled to acquire skills to improve their job performance; half registered out of curiosity (Christensen et al. 2013). However, 39% of students who joined science, health science and math MOOCs did so to gain skills that will help them do their job better (Christensen et al., 2013).

Zhong, Zhang, Li and Liu (2016) bring a different perspective by studying Chinese learners. In this study of learners enrolled in a MOOC developed by a Chinese university, Zhong et al. (2016) found that participants (55%) mostly chose MOOC because it appeared interesting and a good way to obtain knowledge. Twenty seven percent selected their MOOC to gain new skills necessary for job search; and 85% mentioned the convenience of working at their own time and location (Zhong et al., 2016). While these results are in alignment with previous studies on MOOCs, learners also mentioned repeatability, which helps with understanding the content deeply (61% of participants), discussion forum (28% of participants), preference for MOOC over traditional classroom teaching (27% of participants), and visual effects of lectures (19% of participants) as motivations for enrolling in MOOCs (Zhong et al., 2016). Still, these studies on MOOC learners’ motivation did not investigate the motivation of learners assigned to groups in MOOCs. Furthermore, unfamiliarity with online environments, preference for physical classroom, lack of face-to-face interactions, absence of real group discussion time, and fear of MOOCs operation were also identified in the literature as main reasons for not enrolling in a MOOC (Chang et al., 2015). Chang et al. (2015) study seems to suggest that creating groups, establishing interactions within MOOCs, and learners’ familiarity with online environments can motivate students to participate in a MOOC.

Studies on the demographics and motivations of MOOC learners assigned to online group work are still in their infancy. To add to the literature, this exploratory study looked at the demographics of participants—who voluntarily participated in a MOOC course providing enrollees the opportunity to work in groups—in terms of location, gender, employment status, and education. The study also explored students’ motivations for participating in this MOOC.

Drawing from the literature, participants were surveyed to understand if the characteristics of the population in this study focused on grouping students enrolled in this MOOC to assess group effect on persistence and retention, were similar to the characteristics identified in the literature. Based on the literature, the majority of participants in this study was expected to be from different countries, to hold a college degree, to be employed, and with more male students than female students since the course was cross-listed under engineering. Finally, it was also predicted that participants’ primary motivations for taking the course will be related to educational pursuits, professional development, and job performance since the literature shows that learners in MOOCs register for lifelong learning purposes or to gain a better understanding of a topic. Additionally, literature also reports that students in MOOCs related to STEM often enroll to improve job performance and gain skills.

**Methods**

**Participants**

The data presented in this paper are derived from the pre-course survey of MOOC students enrolled in a course offered by the Pennsylvania State University through Coursera platform. The *Creativity, Innovation and Change* (CIC 2.0) was an eight week course, with a total enrollment of 150,317
(Jablokow, Matson & Velegol 2014). However, only findings from course enrollees who volunteered to be assigned to groups and who responded to the pre-course survey (655) are discussed in this paper.

**Course description**

CIC 2.0 MOOC was delivered from September through October 2013, and listed under information, technology, design, business, management, engineering, education and social sciences on the Coursera platform (Jablokow et al., 2014). The course aim was to give students tools that could help them become creative and innovative in order to positively change the world (Jablokow et al., 2014). Students had to watch videos, complete quizzes, engage in forum discussions, write reflections, and collaborate using different social media tools outside of Coursera (Jablokow et al., 2014).

To recruit participants, an email was sent out to students in the CIC 2.0 MOOC inviting students to volunteer for a research study in which they would be placed into groups to enrich their MOOC experience (Hristova & Bayeck, 2015). However, prior to recruiting participants, permission for conducting the study was obtained from the internal review board of the institution where the study and analysis of data were performed. To form the CIC 2.0 MOOC groups, participants were asked to answer prior to the course different questions related to: demographic information and group preferences (e.g., groups based on language, intentions to complete, or time availability). Another item on the pre-course survey was to rank nine statements on how they would like to be grouped with others on a scale of one to nine to capture the importance of each statement (Hristova & Bayeck, 2015). Participants ranked statements such as the language that will be spoken in the group is one in which I’m fluent; ages of the group members are similar to mine; education level of the members (finished high school, some college, advanced degree; or gender (female or male only). This pre-course survey was delivered online via Qualtrics. Six hundred and fifty-five (655) pre-course surveys were completed. Yet, the current paper only presents findings on participants’ location, education level, employment status, gender and motivation for enrolling into the course.

**Data collection procedure and analysis**

To investigate participants’ gender, employment status and education level, learners were asked the following questions on the pre-course survey: “What is your gender? What is the highest level of school you have completed or the highest degree you have received? And what is your current employment status”? Participants’ location was identified by asking the following question: “What country do you live in now”? The motivation for enrolling into the course was assessed by asking participants to rate the importance of statements such as “I am personally interested in taking a course from this particular institution, the skills from this course may be useful for obtaining a new job, or I am interested in connecting with other students interested in the topic” when enrolling into the course. Participants rated these statements using “important, not at all important, very important, moderately important and absolutely critical”. For analysis purposes, “Important” (i.e., important, very important, moderately important, and absolutely critical) and “Not important” (i.e., not at all important) will be used. Frequency analyses were performed using SPSS to answer the research questions.
Findings and Discussion

Participants' location

Participants in this study who completed the pre-course survey and joined this study where they were assigned to groups lived in 82 different countries (Figure 1). Specifically, 25.2% lived in China, while around 19% reported living in the United States during the study. Nearly 8.2% lived in India, close to 4% in Canada and Mexico. Two point four percent (2.4%) lived in Australia, and 2.3% lived in Brazil. Moreover, less than 1% of participants lived in countries such as Iran, Israel, and Denmark, while less than 2% lived in Nigeria, Egypt, France, and Germany. The diversity of participants in this study does not differ from prior findings on MOOC learners (Despujol et al., 2014; Ding et al., 2014).

![Figure 1: Participants by country](image-url)
Participants' gender

Although approximately 2% of participants chose not to respond to the question related to gender, females in this study form the majority of participants (60%) as shown in Figure 2. These results do not align with previous research demonstrating that male students generally constitute the majority of learners in MOOCs (Davis et al., 2014). However, the fact that women outnumbered men in our study may be explained by gender differences in collaboration pattern between men and women. Female students tend to prefer collaboration even in online settings (Johnson, 2011). The invite to participate in a course where they would be assigned to groups may then explain why women are more represented than men in this study. However, based on this result, it may also be assumed that collaboration (if group work is assimilated to collaboration) appeals more to women than men, which aligns with Chan, Huang, Hui, Li and Yu’s (2013) findings on women preference for collaboration.

![Figure 2: Participants by gender](image)

Employment status

Figure 3 shows that 39.5% of participants in this study were unemployed, while 60.5% were working. These results endorse the hypothesis of the study as well as Dillahunt, Wang et al. (2014) findings. In this regard, it may be argued that MOOCs fail to fulfill the goal of democratizing education by providing quality education to those who cannot economically afford quality education (Dillahunt, Wang et al., 2014).

![Figure 3: Participants by employment status](image)

Participants' education level

Table 1 reveals that of the 655 participants in this study, 55.6% had an undergraduate degree or a degree below it; 31.5% had a graduate or professional degree, while 1.2% and 11.8% of learners
had either a primary level or high school level of education. These findings confirm the hypothesis of this study and previous literature on MOOC learners’ education level. MOOC research indicates that college degree holders often make up the majority of MOOC learners (Despujol et al. 2014; Ding et al. 2014).

Table 1: Results of participants’ Education Level

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary school</td>
<td>8</td>
<td>1.2</td>
<td>1.2</td>
</tr>
<tr>
<td>High school or below</td>
<td>77</td>
<td>11.8</td>
<td>13.0</td>
</tr>
<tr>
<td>Degree (undergraduate and below)</td>
<td>364</td>
<td>55.6</td>
<td>68.5</td>
</tr>
<tr>
<td>Degree (graduate and professional)</td>
<td>206</td>
<td>31.5</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>655</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Motivation for taking the course

Figure 4 displays the different reasons that motivated students in our study to enroll into this course. One of the greatest motivating factors for students was friends taking the course (99.7%). Professors teaching the course also encouraged students to enroll into the course (91.6%). 81.2% took the course because they wanted to use the skills they will acquire in the course, while 71.9% were driven by their job. And 66.7% were stimulated by personal interests. The institution reputation (65.5%) and desire to connect with others (57.9%) appear to be other incentives for students to join in the course. These findings seem to suggest, in terms of importance, that taking the course with friends, professors teaching the course, acquiring skills, course relationship with the job, personal interest, the institution reputation, connecting with others interested in the topic, and earning credits are principal stimuli of respondents in this study. Participants’ motivation for taking the course can be placed in these three main categories:

- Build relationships which includes the following reasons: friends and connect with others;
- Personal development category that contains acquiring skills, course related to job, earning credits, and personal interest;
- Reputation, which encompasses professors and institution.

These findings to some extent do not differ from previous studies that report skills development, exploration of areas of interest, and the desire to learn new concepts as motivating factors for learners to register in MOOCs (Chang et al., 2015). However, compared to other studies (Radford et al., 2015; Stokes, Towers, Jinks & Symington, 2015; Zhong et al., 2016), earning credits and the relationship with participants’ program, which can be assimilated to educational pursuit in previous studies, are not as important as friends when it comes to stirring students to enroll into a MOOC. For instance, 53.7% were stimulated by the connection of the course to their program, but 79.5% did not enroll to earn credits. Additionally, these findings tend to suggest that friends have great influence on students’ choice of course. The majority of students (99.7%) joined the course because of their friends. This finding (i.e., taking the course because of friends) may be explained by participants’ location. Indeed, students living in China and the United States formed the majority of learners (Figure 1). Furthermore, this MOOC was translated in Chinese which may explain why the factor of “friends taking the course” appears as one of the top reasons for taking the course among students.
participants in our study. Therefore, it is likely that friends may have recommended or decided to take the similar course

Interestingly, researchers investigating the relationship between friends and college choice and/or experience described for example the relationship between friends' and education. Alvarado and López-Turley (2012) in their study found that the likelihood for Latinos and White students with college-oriented friends to apply to a four-year college or any college was high compared to students who did not have college-oriented friends. Friends do inform decisions about higher education institutions or potential schools, and courses selection (Brooks, 2003; Johnston, 2010; Alvarado & López-Turley, 2012). Although these studies were not related to MOOCs or other form of online education, they do shed some light on the findings of this study. These findings suggest that more research needs to be conducted to better understand the impact of friends on course choice and the influence friends may have on retention and performance in MOOCs and other type of online education.

Conclusions and Implications

Findings show a different trend in terms of gender differences in MOOC enrollments. Compared to previous studies, our findings indicate that women in this study surpassed men in number. The results suggest that group work/collaboration seems to appeal to women even though the course was listed as an engineering course. It may therefore be proposed that to attract more women and ensure their persistence in fields such as science, technology, engineering, and mathematics (STEM), group work as a teaching and learning strategy should be integrated in STEM courses. Indeed, research explains that the percentage of women in STEM field majors is low compared to
Exploratory study of MOOC learners’ demographics and motivation: The case of students involved in groups

men’s (Little & León de la Barra, 2009). Adding group work or collaborative work to other strategies designed to increase the percentage of women in STEM fields might be a plus for online and face-to-face learning environments.

The findings also indicate that even in this study on groups in a MOOC, the majority of students were college degree holders, with employment. In other words, college degree holders, and employed individuals are still the ones benefiting from MOOCs availability. To make instruction accessible to those who would not otherwise have access to high quality education, developers and MOOC providers might need to democratize MOOCs’ distribution. For example, partnering with organizations (e.g., non-governmental organization, or community centers) that work with individuals in financial need might be an excellent approach to reach and attract low-income individuals. MOOC providers may use those organizations as centers individuals can visit to enroll into MOOCs and even take MOOC since this population does not always have access to the internet. The aforementioned strategy might make MOOCs more accessible to economically disadvantaged or non-college holder individuals. Engaging with governments around the world, specifically in emerging or developing countries might be another approach to making MOOCs accessible to masses.

Participants’ primary motivation for taking this course was “friends taking the same course.” Although previous studies revealed that professional and educational pursuits for example are among principal motivators for MOOC learners (Stokes et al., 2015; Radford et al., 2015), these results seem to signal the importance of friendship in MOOCs and other learning environments. While Belanger and Thornton (2013) did find that MOOC learners were also motivated by social experience, this study reveals the effect friends have on MOOC enrollment. Creating a friendly environment might be conducive for learning and affect motivation. For instance, Kember, Ho and Hong (2010) found that teacher’s friendliness, among other factors, motivated students’ learning. Furthermore, for MOOC and other online course developers, this may imply providing tools that can enhance and sustain friendship; tools that can encourage socialization in an online learning environment. Discussion forums are already used in MOOCs; but if the following definition of “friend” by the Thesaurus online dictionary is adopted: “a person attached to another by feelings of affection or personal regard”, integrating tools that may allow for more privacy may be better than discussion forums. These findings may also suggest that course recruitment and/or advertisement strategies might need to change to include individuals and their friends. A community-type approach may be adopted by MOOC providers to target individual students but also their friends. Simply said, teachers, MOOC providers, or institutions may need to emphasize in their message to potential learners the following “Tell your friends”, or “Enroll with your friends” in order to recruit individual students and their friends.

Future Research

This paper adds to the literature on MOOCs by describing the demographics of MOOC learners who participated in study on groups in a MOOC and their motivations for taking the course. Although the study found that the percentage of female was greater than the percentage of male students, it will be interesting to examine the completion rate of female compared to male students. It will also be interesting to investigate the completion rate of participants who were motivated by friends taking the course to register into this MOOC in order to assess the effect of friends on completion rate for example. Finally, comparing participants engaged in groups with participants who worked individually in this MOOC in terms of demographics and motivations may give more insight into the relationship among group work, demographics, and motivations.
References


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Exploratory study of MOOC learners’ demographics and motivation: The case of students involved in groups


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Incentives and barriers to OER adoption: A qualitative analysis of faculty perceptions

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Abstract

In this paper, 218 U.S faculty responses regarding Open Educational Resources (OER) were qualitatively analyzed. Ten categories emerged in the coding process. The top three categories that indicated barriers to the adoption of OER were need more information (faculty wanted more information before they would be willing to adopt OER), lack of discoverability (faculty wanted to be able to easily find repositories of OER), and confusing OER with digital resources (faculty were unaware of the difference between digital resources and OER). The top incentives identified in this analysis to overcome these barriers include student cost benefits (saving students money), student pedagogical benefits (faculty being able to make changes to OER to improve course content and instruction), and institutional support for the adoption of OER (whether in the form of course load reduction, curricular research assistance, or library support for finding and adopting OER). Future research is needed to better understand how to address and overcome these barriers to OER adoption.

Keywords: Open Educational Resources; OER; Perceptions; Traditional resources; Motivations; Barriers

The desire to improve learning and the resources that facilitate learning is a priority for educational institutions and their faculty members. Instructors adopt a variety of learning materials to improve student success, and one of the most heavily adopted learning resources is the textbook. While there are countless textbooks available from a variety of distributors and for a wide range of costs, there are also a significant number of learning materials, including textbooks, that have been made publically available at no cost under open licenses. These are known as open educational resources (OER). The rise of OER was a result of an initiative out of the Massachusetts Institute of Technology (MIT) in an effort to place learning materials on the Internet at no cost (Goldberg, 2001). The OER movement gained global awareness in 2001 and has reached a heightened popularity since this time (Guttenplan, 2010). A majority of educators, however, continue to be unaware of OER as a potential resource, and some have negative perceptions regarding OER (Allen & Seaman, 2014).

The United States Bureau of Labor statistics reported in 2009 that higher education costs have risen over 538% since 1985. Although there are many ways to cut costs in education, a feasible way to cut costs for students is through the adoption of OER. Allen and Seaman (2014) reported that there were existing faculty suspicions of quality of these resources thus impeding adoption, but the adoption of open textbooks has most often shown to result in slightly better or no significant difference in student performance (Bowen, Chingos, Lack & Nygren, 2012; Lovett, Meyer & Thille, 2008; Robinson, Fischer, Wiley & Hilton, 2014; Wiley, Hilton, Ellington & Hall, 2012). Although several additional empirical studies have demonstrated the efficacy of OER (Hilton, 2016), some faculty members are still wary of the quality of OER—despite cost and potential pedagogical benefits.

The future of OER will likely depend on how it is perceived by individual faculty members. The aim of this study is to understand awareness of and attitudes towards OER through free response analysis of faculty members in the United States. The responses will be analyzed to inform both barriers and motivators to OER adoption in the US. Understanding the attitudes collected in this
study will help inform the adoption and sustainability barriers of OER as well as provide some possible incentives to help increase OER adoption.

Literature review

Although OER are gaining popularity, there is a lack of empirical research regarding the perceptions of these resources (Bliss, Hilton, Wiley & Thanos, 2013). In our review, we have divided the perception studies into two groups: (1) those that sample a group of faculty and students after OER had been used and (2) those that sample a group of faculty without knowing whether or not they have a background knowledge of OER.

Perceptions of quality after OER use

Bliss, Hilton et al. (2013) conducted a study regarding perceptions of OER in a community college setting. The faculty and student perceptions of the OER were primarily positive, with only 3% of those surveyed stating that the OER were worse than traditional textbooks; 56% of faculty stating they were the same quality; and 41% stating they were better than comparable resources. In an extension of the study, an additional 58 teachers and 490 students were surveyed regarding their experience using OER in their courses (Bliss, Robinson, Hilton & Wiley, 2013). Similar results in both instructor and student perceptions were discovered. Approximately half of students surveyed stated that the resources used were of the same quality as traditional resources, and 40% perceived the OER as better than traditional resources. Faculty responded similarly, with 55% stating that the resources were the same quality, and 35% felt that the OER were better quality.

Other perceptions studies were administered after courses had adopted OER in the place of traditional resources. Lindshield and Adhikari (2013) studied the perceptions of a group of students in a human nutrition class that had adopted a digital open textbook. “Students favorably rated their level of satisfaction, liking the idea of the [digital OER], ease of [digital OER] use, not having to buy a textbook, and preferring the [digital OER] versus buying a textbook for the course” (Linshield & Adhikari, 2013, p. 28). Students who had used OER perceived them positively and stated that they would not be in favor of replacing their open textbook with a traditional course textbook. Lindshield and Adkhikari (2013) also administered a survey to a group of faculty and students who replaced their statistics textbook with an open textbook. Their perceptions were quite positive, especially relating to the cost difference savings. A majority of the students surveyed (65%) stated that they preferred using an open textbook and they attributed this preference to cost and ease of use.

General Perception Studies

General perception studies have been conducted on groups of faculty that have had various levels of interaction with OER. In 2014, Allen and Seaman conducted the Babson Study where a nationally representative group of 2,144 faculty from institutions across the United States were questioned regarding their opinions of OER. Of the faculty surveyed, 61.5% stated that they perceived OER to be of the same quality of a traditional resource, and approximately 12% expressed that they believed OER were better quality. This study is unique in its comparatively large percentage of faculty (26.3%) stating that traditional resources were superior in trusted quality. Faculty responses regarding proven efficacy (one of the categories identified in the Babson Study) yielded similar results, although in this category only 15.3% faculty believed that traditional resources were of a higher proven efficacy. Nearly two thirds of faculty self-reported as being unaware of OER and one half of faculty stated that they had never used an OER. Of those who had reported using OER, there were many
who did not display a full knowledge of what differentiates OER from free online resources. Lack of understanding of what OER encompasses and lack of experience with using OER could have affected some of these responses, including respondents stating that they prefer a traditional resource.

A similar study at a single institution conducted in 2012 revealed that only 18% of faculty had heard the term OER despite an open initiative that had been launched at the university (Rolfe, 2012). Surveys were conducted on attitudes towards and adoption of OER. Approximately 50% of instructors were comfortable seeking out and utilizing resources from the Internet, but only 12% of the same group of faculty made their personal resources globally available. Although instructors were often comfortable seeking online resources and using them, many were unaware of OER.

Other studies have been conducted internationally and have yielded similar results of lack of awareness, and generally positive perceptions from the majority of faculty towards OER (Venkaiah & Ambedkar 2012). Some of these studies outline specific adoption barriers of OER. Abeywardena, Gajaraj, and Chan (2012) highlighted barriers of discoverability of resources, as well as time available to evaluate resources as barriers. No other barriers were discussed in this paper. Additional barriers such as Internet accessibility and reliability were outlined by Mtebe and Raisamo (2014) but were specific to their region of study (Africa). Although perceptions towards OER are generally positive, and some literature exists on barriers, the context of these studies is primarily international. In addition, the relationship between motivators and barriers has been left out of all existing literature.

Of these OER perception studies, the bulk of respondents state cost to be the primary benefit of adopting an open resource. Many studies have shown significant savings on textbook costs in courses that adopted OER (Wiley et al., 2012; Hilton, Gaudet, Clark, Robinson & Wiley, 2013; Hilton, Robinson, Wiley & Ackerman, 2014). Although cost savings are an important benefit of adopting OER, there are perceived and actual benefits beyond cost savings. “Creative use of OER” (e.g., combining excerpts of various OER or leaving room for student adaptation of the materials) can also result in benefits such as student achievement and increased retention rates (Pawlyshyn, Braddlee, Casper & Miller, 2013, para. 1). These benefits inform the discussion on motivations for OER adoption.

While these studies have provided a foundation for OER perceptions research, additional empirical studies are needed to more fully understand faculty perceptions of and attitudes towards OER. Previously published studies, while addressing likes and dislikes of OER, do not deeply address motivations and barriers for adoption, as well as their relationship to one another. The majority of these studies have used self-report Likert scale survey data to investigate faculty perceptions of OER. However, significant detail is lost when you constrain responses to a 7-point quantitative scale. Additional information can be discovered through coding of open responses. The aim of this study is to further investigate faculty perceptions of OER by examining qualitative faculty responses regarding perceptions of OER to understand motivations and barriers for adoption.

**Methodology**

This study is the analysis of 218 faculty respondents who provided free response comments at the conclusion of a general perceptions study of OER. The responses are drawn from a larger survey that resulted in the aforementioned Babson Study Report (Allen & Seaman 2014). Faculty were vetted through a multi-stage selection process that was intended to create a nationally representative sample of those teaching in higher education in the U.S. Data was obtained through Market Data Retrieval, randomly selected, checked against opt-out lists, and reviewed for working e-mail addresses.
A total of 2,144 faculty responded to the survey, and of these, 361 chose to provide additional information at the end of the survey regarding their perceptions of OER. From that group, 218 faculty provided permission for future use and quotation of these comments. These responses were analyzed in this study. Faculty respondents of the full survey were representative of a complete range of faculty and higher education institutions. Respondents were employed at two-year, four-year, private, private nonprofit, and public institutions. Nearly 25% of faculty teach online courses. Respondents were from an exhaustive list of disciplines, were both full- and part-time and were at various stages of their careers (some tenured). Faculty were evenly split between genders. Although the entire survey population was equally represented by gender, full or part-time status, and discipline, not all faculty chose to leave an open response at the end of the survey, so the sample for this study may not be representative of the entire survey population.

**Data Analysis**

Exploratory, categorical and comparative coding were used to analyze the responses of the participants. The responses were first coded for meaningful statements that relate to cost, outcomes, use, and most prominently perceptions of OER (Bliss, Robinson et al., 2013). The qualitative data analysis tool Dedoose (dedoose.com) was used to code and categorize responses to this survey. Statements that did not address OER or traditional resources were coded as not relevant to the study and excluded from analysis. Each statement within a faculty response was coded into a specific perception category. Because many faculty comments contained multiple statements regarding OER perceptions, a single comment could receive multiple codes. For example, the following comment of, “many educators are enthusiastic and interested in new technologies but do not have the time to develop them themselves; we need to know where to go for high-quality resources that will fit with our course goals and that can be easily adopted by us and our students” received both the codes lack of time as a barrier, and lack of discoverability. Although a comment could receive multiple descriptive codes, no response received any particular code twice. For instance, a single faculty member comment that mentioned quality of OER twice would only receive that code once. 322 codes were generated from 218 respondents. Cross comparative analysis was done and then conclusions were compared back to the original statements to ensure reliability across findings.

For our final analysis, we grouped responses based on whether they came from full-time or part-time faculty. Then, we compared the two groups to see if OER perceptions changed between part-time and full-time faculty. We also grouped faculty responses by discipline (e.g., science, business, social science, etc.) to see if perceptions towards OER changed between disciplines.

**Results**

Table 1 illustrates the frequency with which each of the 10 categories were used as codes across the 218 comments in the OER faculty perceptions data set. The Percent of Total column does not total 100% because many comments received multiple codes. Comments totaling 1% or less of the respondents were excluded from the table due to lack of representation across faculty members. Themes in faculty responses will be discussed in order of topic frequency and within the context of their respective incentive and barrier categories. Coding category descriptions are listed in Table 2.
Table 1: Number of comments coded by category from faculty responses

<table>
<thead>
<tr>
<th>Category Name</th>
<th>N</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need more information</td>
<td>80</td>
<td>36.7</td>
</tr>
<tr>
<td>Lack of discoverability</td>
<td>36</td>
<td>16.5</td>
</tr>
<tr>
<td>Confusing OER with digital resources</td>
<td>28</td>
<td>12.8</td>
</tr>
<tr>
<td>General positive perceptions</td>
<td>25</td>
<td>11.5</td>
</tr>
<tr>
<td>Not applicable for faculty</td>
<td>24</td>
<td>11</td>
</tr>
<tr>
<td>Lack of time to evaluate resources</td>
<td>23</td>
<td>10.6</td>
</tr>
<tr>
<td>Cost benefit</td>
<td>23</td>
<td>10.6</td>
</tr>
<tr>
<td>Equal to traditional resources</td>
<td>23</td>
<td>10.6</td>
</tr>
<tr>
<td>Pedagogical benefits</td>
<td>20</td>
<td>9.2</td>
</tr>
<tr>
<td>Lack of OER quality</td>
<td>20</td>
<td>9.2</td>
</tr>
</tbody>
</table>

**Need More Information**

The majority of faculty surveyed (n = 161) had varying statements that expressed a need for further understanding of OER. These spanned from a complete lack of awareness of OER (need more information) to a need to be directed towards specific repositories (lack of discoverability). The highest percentage of these statements fall under the code need more information.

The need more information code was reserved specifically for respondents who made general requests for information about OER and the nature of OER, rather than specifications of OER adoption or where to find these resources. This code represented 36.7% of faculty and was by far the most common response. Desire for more information ranged from faculty who simply stated that they are “not sure what OER is” or “my awareness of OER is in its early stages” to questions of specific pedagogical benefits or access to empirical studies that validate the effectiveness of OER. Generally, faculty who did not have a full understanding of OER were still receptive to positive information on OER. It is for this reason that the need for more information is neither a barrier nor an incentive because although faculty could not adopt OER without the information, their responses that requested more information were generally quite positive and welcoming to OER adoption. Many stated that the survey had piqued their interest and they were planning to further investigate OER.

Table 2: Code Category Definitions

<table>
<thead>
<tr>
<th>Category Name</th>
<th>Description of Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need more information</td>
<td>Requests for additional information about OER</td>
</tr>
<tr>
<td>Lack of discoverability</td>
<td>Unsure of where to find resources and requests for repositories</td>
</tr>
<tr>
<td>Confusing OER with digital resources</td>
<td>Highlighting positive and negative features of digital resources that are not inherently related to OER</td>
</tr>
<tr>
<td>General positive perceptions</td>
<td>Positive statements about OER that were not supported with reasoning</td>
</tr>
<tr>
<td>Not applicable for faculty</td>
<td>Lack of ability to use OER in their subject or classroom</td>
</tr>
</tbody>
</table>
Lack of Discoverability (Barrier)

A significant barrier that OER are facing in reaching positive perceptions and adoption is the lack of discoverability of these resources. Participants expressed serious concern in their inability to find OER. Thirty-six faculty members expressed frustration with the lack of aggregated and discoverable resources. Many respondents stated that a peer-reviewed repository of these materials needs to be created or marketed. A full-time mathematics faculty member observed that “material that is free and available needs to be marketed and collated in a database properly since many of the well-intentioned professors don’t know about some of these materials.” A full-time business administration faculty member explicitly noted that this was a barrier by stating that “the main impediment to [their] using OER is really just lack of knowledge about what is even available.” Again, faculty expressed that if this barrier could be overcome, their perceptions towards and adoption of OER would be more favorable.

Confusing OER with Digital Resources (Barrier)

The most common negative perceptions of OER were founded in a lack of understanding of what OER specifically entail. Although this may be an interpretation flaw on the part of faculty regarding the definition of OER provided to them, many of these misconceptions were founded in a deep-seated frustration with new technologies. Twenty-eight faculty members were concerned with the digital nature of OER. Lacking the knowledge that OER have the capacity to be printed or purchased and are not inherently digital, these participants expressed concern with bringing digital resources into the classroom. Faculty were explicitly stating that OER and technology in learning should not replace face to face interactions and upheave the traditional classroom structure. A full time humanities professor stated that “the use of technology in the classroom is important but it should not replace traditional modes of teaching and learning.” A full-time social science professor shared a similar sentiment and stated, “technology should not replace interactive learning with live peers and faculty” and “that for our cognitive, social, and probably physical and civic welfare, we all need to spend less time with content on screens, and more time with live human beings.” Participants also expressed concern of digital readability, as well as overwhelming their students with the capabilities needed to navigate digital resources.

General Positive Perceptions (Incentive)

There were 25 respondents who expressed generally positive perceptions, without explicitly stating the reasons for their favorable views of OER. Faculty stated that OER are “welcome addition[s] to their classroom”, “the way of the future” and that they “would like to see more open teaching material, as well as more education for faculty” in the usage of these materials.
A few faculty members were already using OER or seeking out ways to release their materials under open licenses. Of these faculty, many of them felt strongly about openly licensing their materials. A few of these faculty discussed the importance of equity and open access, e.g., “I feel quite strongly about open access to all of my scholarly work. All of my lectures are [creative commons] licensed, as is all of my research.” Some of these instructors employ curriculum research assistants; others are creating open source textbooks for interdisciplinary courses. Some stated they were glad to share what they develop, and need information on open licensure and how to release OER to fully take advantage of the affordances of OER. Although work needs to be done to adopt these OER, there are many faculty, experienced and inexperienced with OER, that welcomed the idea of exploring new OER in their classroom.

Not Applicable for Faculty (Barrier)

Participants also responded stating that there are no appropriate OER for their area of study (N = 24). Some of these participants sought out a resource and were unable to find one; others did not express having searched for OER in their domain. Lack of open resources can be a reality for highly specialized fields along with faculty that teach in experimental ways. In these situations, this lack of applicability can be considered a barrier. It is also the case that some courses do not require educational resources. A part-time natural science faculty shared: “Sometimes the solutions to quality education are low tech. For example, I teach a course in climate science and change.” The faculty member then explained the key aspect of the class was a field trip.

We use no Internet, no electronic media. Aided by binoculars, the field journal is the primary instrument. Students read hard copies of peer review[ed] science and we travel with a course library for reference. This is one of the most powerful learning experiences there is, don’t you think? Electronic media too often gets in the way and serves as a barrier between the learner and that which they want to understand. As the great poet Basho said, if you want to know the pine, go to the pine.

While some faculty are unaware of OER or do not think there are available OER related to their domain, it is likely that it exists—faculty just struggle to find it. Further research should be conducted on how to help faculty members identify suitable OER for classroom use.

Lack of Time to Evaluate Resources (Barrier)

Another barrier to OER adoption is the amount of time that it takes to evaluate these new resources, some of which have not yet been through a review process. Although faculty stated that they would be open to using OER in their courses, they expressed that it was not attainable for them to spend the necessary time evaluating and adapting these resources. A full-time engineering faculty stated that they intend to spend the time seeking out, evaluating, and adopting some of these resources once they obtained tenure. Another faculty member who has begun the adoption of OER in their courses hired a “curriculum research assistant” for the sole purpose of evaluating these types of materials. Unfortunately, as expressed in the statements of other faculty, excess time and research assistance for curriculum evaluation are not resources that all faculty have. Twenty-three different faculty members expressed this to be a barrier that, unless overcome through institutional support, will hinder adoption of OER.

Cost Benefit (Incentive)

Cost was the most frequently mentioned specific benefit of OER. Motivations for faculty to cut costs included student convenience and equity. A full-time humanities faculty stated that they are “driven by the inequality [they] see and the many students who can’t afford course materials to choose
OER for [their] courses." This was the case for 23 faculty members who attributed the cost savings as an important benefit of adopting OER in their courses. Faculty expressed that the potential savings for students alone can be a motivator to invest the time in discovering, adopting, and adapting open resources.

**Equal to Traditional Resources (Incentive)**

A number of faculty (N = 23) judged OER quality as the equivalent to the quality of copyrighted materials. These respondents understood that OER vary in quality much like traditional resources. A faculty member shared, “OER is a mixed bag, some materials very much better than the commercial domain, some very much worse.” These faculty believed that the materials should be evaluated on a singular basis as opposed to grouping all open resources together. Time investment is also necessary in selecting any resource, open or copyrighted. A full-time mathematics faculty member attributed time as a barrier to all resource selection, who stated that “textbooks have exactly the same problems and it is still the time that it takes that is a deterrent.” These respondents were clear in sharing their concerns with OER while acknowledging that these are problems that are not exclusive to any educational resource. This can be considered an incentive to adoption because faculty members who equated the resources expressed understanding of the added cost benefit that OER allows while providing resources of equal quality.

**Pedagogical Benefit (Incentive)**

Along with cost benefits, pedagogical benefits were highly cited as a perceived positive outcome of using OER in a course. There were 20 respondents (9%) who stated that flexibility of adapting materials to their teaching needs was a benefit of OER. A full-time linguistics/language faculty stated: “I particularly like to be able to adapt materials to my course or to the styles of teaching compatible with my own.” This faculty credited OER with the flexibility to make these adjustments. Another expressed pedagogical benefit was breadth of knowledge and encouragement to work with students and faculty worldwide by providing an experience that is inclusive of broader materials than those available at individual institutions. Faculty shared that the pedagogical benefits were motivators for them to take time to evaluate open resources.

**Lack of Quality (Barrier)**

There were 20 respondents who felt that OER lacked the quality that a traditional resource would have. These faculty had either interacted with poor quality OER in the past, or are simply skeptical of free resources. For example, one full-time humanities faculty member stated that they are simply “suspicious of some ‘open’ approaches” such as MOOCs. These suspicions are prevalent among faculty who see free and open for their weaknesses, which include lack of publisher accountability and peer review. Although this is not the case for all OER, it is true that open resources, as well as traditional resources, are of varying quality and some will not be appropriate in the classroom setting. With the combination of varying quality of resources and a lack of time to evaluate these resources, many instructors will never attempt to evaluate or utilize these resources without outside aggregation support in the form of resource directories and training on how to use open resources.

**Group Comparisons**

We first compared full-time faculty perceptions of OER to part-time faculty perceptions of OER. We found differences between the two groups of faculty on three different codes: need more information, lack of time to evaluate resources, and lack of discoverability. Almost half of part-time faculty (48%)
indicated they would like more information about OER in order to facilitate the adoption of OER; however, only 34% of full-time faculty indicated the same. Part-time faculty also were less concerned with a lack of time to evaluate resources (4%) when compared with full-time faculty (13%). Finally, part-time faculty indicated they were less concerned with finding resources, with only 10% indicating a need for discoverable repositories while 19% of full-time faculty indicated the same.

Our next group comparison analysis examined faculty responses across discipline. Disciplines were grouped into the following categories: science, social science, humanities, business, engineering, and other. We found a few small differences between disciplines; however, due to the small sample sizes within disciplines (Business N = 12, Engineering N = 32), we conclude that responses were reasonably consistent across disciplines. This is beneficial in determining there are not differences in perception of OER across faculty in different disciplines.

**Discussion and Future Research**

The most prominent response from faculty was that they need more information on OER. Faculty would like to know what OER entail, how to release their materials under open licenses, and where to find reliable OER. In addition, faculty would like reports on the quality and outcomes of OER. In a time when awareness of OER is spreading, it can be easy to assume that knowledge of OER is prevalent among educators. However, 73.9% (N = 161) of faculty expressed statements across multiple codes lacking understanding, which is indicative that awareness and understanding of OER are still important issues that should continue to be addressed. This study provides an overwhelming call for a more widespread dissemination of information regarding OER. This is based on high percentages (73.9%) of a nationally representative group of faculty that indicated through inquisitive statements that they would be open to information informing potential OER adoption.

Another implication that arose from the responses was the need for institutional support for OER evaluation and adoption. Faculty do not have the time to evaluate new resources. Furthermore, this is not a priority for faculty members who are working towards tenure, mentoring students, or teaching many courses. Institution may need to provide support for the time spent evaluating these resources. This support could come in the form of curricular research assistance, department policy allotting specific time for evaluating new resources, or library support in choosing high caliber OER materials.

Some faculty shared the need for central repositories of open resources that ideally have been previously vetted for quality. Ironically, there are several databases that house OER and provide reviews of these resources. There are existing repositories such as the Open Textbook Library, OER Commons, and Cool4Ed. However, faculty often are not able to find materials that fall into their area of study because of lack of awareness. If faculty were aware of centralized repositories with quality evaluation, they expressed they would be much less hesitant to consider using these cost saving resources. The existence of these repositories themselves is not enough; it must be coupled with an increased awareness of where to find these OER along with how to easily implement them into a course. If we can provide this group of faculty with an increased knowledge of OER repositories and their evaluation protocols, they would all likely adopt OER. More research should be conducted to determine how to best spread awareness of OER repositories.

Perhaps the most impactful finding in this study was the importance that faculty placed on cost and pedagogical benefits for their students. The two benefits were nearly equal in priority for educators. In fact, these student benefits were a major motivating factor for faculty to explore OER despite existing adoption barriers. Faculty expressed they were willing to spend time to seek out and evaluate open resources even though these tasks were major barriers of OER adoption. More research should be conducted to determine how to motivate faculty to adopt OER using student cost and pedagogical benefits as motivators.
Our final analysis showed differences between part-time and full-time faculty. Part-time faculty, when compared with full-time faculty, responded more frequently with requests for more information on OER, indicating they were less concerned about the time needed to evaluate or adopt OER, and stated they were less concerned with their ability to find existing repositories of OER. More research should be conducted to determine what these differences mean in helping faculty overcome the barriers of adopting OER.

This study is significant in its investigation of motivations and barriers as stated by faculty. Data collected on free responses provides insight not obtainable by previously conducted quantitative studies. The study also uniquely discusses the relationship between the motivations and the ability they provide for faculty to overcome barriers to adoption. The connection between incentives and their ability to motivate faculty to overcome barriers has not previously been drawn. Although this correlation has been hypothesized, the connection drawn by the faculty members themselves has not previously been outlined in literature. Understanding barriers in the context of our ability to overcome these barriers is significant.

Models for overcoming barriers of time, discoverability, and lack of understanding of OER must be explored. It is valuable to understand faculty perceptions in exploring potential use of OER, but understanding these opinions does not inherently address barriers to potential adoption. In order to create prescriptions and actionable plans for faculty support of resource selection, successful models for overcoming these individual barriers need to be identified and explored.

Limitations

There are limitations to some of the conclusions drawn in this study due to uncontrollable variables within a research study. Instructors need a better understanding of OER before they can accurately speak to benefits and drawbacks of these resources. Faculty opinions may be uninformed and inaccurate due to lack of experience with these resources. Another limitation is the survey responses were collected based on personal willingness to participate. This can create a self-selection of individuals who may not be as nationally representative of faculty as demographics would suggest. Self-selection to participate in this survey can cause respondents on polarizing ends of a spectrum of opinions and can preclude some who feel they do not have a radical opinion regarding OER or who have not had extensive experience with open resources. Interpretation of statements in any qualitative analysis is always subjective to a degree, so codes were reviewed by two researchers in order to ensure consistency and accuracy across coding. The results of the survey are reflections of direct faculty statements and inform directions for future research needs.

Conclusion

We conducted a qualitative analysis of 218 open-ended faculty responses regarding OER perceptions. Previous studies on OER faculty perceptions have used predominantly self-report Likert scale surveys. However, this study provided a more nuanced picture on faculty perceptions of OER than these quantitative studies because of the detailed nature of open-ended faculty text responses. Our qualitative analysis yielded ten distinct categories of responses and together these categories compile 73.9% of a nationally representative group of faculty that have questions pertaining OER including what OER entail, how to overcome time barriers of OER, and where to discover quality OER. The most common category, 37% of faculty, was need more information; this indicated that faculty were interested in adopting OER but needed more information before they would feel comfortable doing so. Another top category, need for central repositories, included 16% of faculty who indicated a need for central repositories of OER that are easily discoverable.
main barrier for adoption of OER identified in this study is that they do not know where to find the
time to evaluate OER. As a possibility to overcome this challenge, 11% of faculty indicated that
institutional support for the evaluation and adoption of OER would increase their likelihood to adopt
OER. This could be in the form of course load reduction, curricular research assistance, or monetary
compensation for the evaluation and adoption of OER. A unique aspect of this study is faculty
expression of student cost and pedagogical benefits to overcome perceived barriers. These student
benefits resulting from faculty adoption of OER proved to be the most motivating for faculty. A
number of faculty (20%) indicated that cost and pedagogical benefits for students provided the
motivation needed to take the time to evaluate and consider adoption of OER.

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Sharing of Knowledge among Faculty in a Mega Open University

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**Abstract**

Developments in ICTs and knowledge societies have revolutionized the traditional paradigms of education. There is a lot of emphasis on a culture of sharing and collaboration in the education scenario of today though educators have certain inhibitions about sharing of knowledge, ideas and resources. The present study was undertaken to explore the sharing behaviour of the faculty of the National Open University in India. Data was collected through a structured questionnaire on knowledge sharing behaviour and barriers to sharing from 62 faculty members belonging to various disciplines. The findings suggested that sharing was less preferred voluntarily and in networks; publishing was most preferred knowledge sharing mechanism; sharing of learning materials was more encouraged in the institution; and borrowing from Internet was more preferred. The important perceived barriers included lack of recognition and absence of organizational knowledge sharing culture. The findings have been discussed in relation to related research and the existing institutional context.

**Keywords:** Knowledge Sharing; Sharing Behaviour; Barriers to Sharing; Faculty; Open University; Distance Education

**Introduction**

In the ICT-integrated knowledge society of today (van Weert, 2005), knowledge is considered as an invaluable strategic asset (Narasimha, 2000) and a critical resource in the determination of competitive advantage (Grant, 1996; Dunford, Steane & Guthrie, 2001). Organisations are paying considerable attention towards proper “coordination and exploitation of organizational knowledge resources, in order to create benefit and competitive advantage” (Drucker, 1999, p. 157). There is an increased stress on sharing and optimal utilization of knowledge for improved productivity in organizations. This is also true for academic institutions, which are service-oriented and knowledge intensive organizations, of late facing ever-growing faculty demands for sharing quality resources and expertise (Kim & Ju, 2008). In today’s knowledge economy, knowledge sharing is equally crucial in the context of Open and Distance Learning (ODL) institutions. Effective knowledge management involves sharing of both tacit and explicit knowledge. Knowledge sharing and knowledge management in the context of academic institutions is often found to be inefficient and not systematic (Kim & Ju, 2008). Therefore, it was considered important to study, the status of and barriers to knowledge sharing in a mega open university. Further, as a sequel to this, to what extent therefore open universities are prepared to take along the current reforms in open sharing and open educational resources.

**Literature Review**

*Knowledge Sharing: An Overview*

Knowledge is defined as “a fluid mix of framed experience, values, contextual information, and expert insights” (Davenport & Prusak, 1998, p. 5). It refers to sharing of mutual knowledge, beliefs and assumptions (Clark & Brennan, 1991). Van den Hooff and De Ridder (2004, p. 119) note that,
“knowledge sharing is the process where individuals mutually exchange their (tacit and explicit) knowledge and jointly create new knowledge”. Knowledge in an organization exits at multiple levels—individual, group and organizational levels (De Long & Fahey, 2000). Parry (2010) notes that knowledge creation takes place primarily at the individual level, knowledge sharing takes place at the group level, and utilization of knowledge occurs at the organizational level. Nonaka and Takeuchi (1995) pointed out that organizations cannot create knowledge without individuals and, unless individual knowledge is shared by other individuals and groups, such knowledge is likely to have limited impact on organizational effectiveness.

It is being realized that knowledge sharing is critical to knowledge creation, organizational learning, and performance achievement (Bartol & Srivastava, 2002). Eriksson and Dickson (2000) mention four basic elements in knowledge sharing—(i) shared knowledge creation process: the process of creating and distributing knowledge; (ii) IT (information technology) infrastructure: the system and tools that support information dissemination; (iii) catalysts: media that facilitate and promote knowledge sharing; and (iv) values, standard and procedure: social and cultural values that influence personal mind set.

According to Ipe (2003), factors that influence knowledge sharing include:

- the nature of knowledge,
- motivation to share,
- opportunities to share, and
- the culture of work environment.

Numerous researchers (Jolaee, Nor, Khani & Yusoff, 2014; Kuo & Young, 2008; Cabrera, Collins & Salgado, 2006; Bock, Zmud, Kim & Lee, 2005; Lin & Lee, 2004; Bock & Kim, 2002) have investigated knowledge sharing behaviour in terms of factors such as attitude, intention, subjective norms, and so on. Some other factors, found to be influencing knowledge sharing, are organizational context, management support, hoarding, reciprocity, trust, rewards mechanisms, and relationship with recipient. Lin (2007) mentions two factors as proximal determinants of knowledge sharing—enjoyment in helping others and knowledge self-efficacy.

**Barriers to Sharing of Knowledge and Learning Resources**

Organisations and individuals do face barriers to knowledge sharing. Such barriers have been categorized as individual, organisational and technological (Riege, 2005; Taylor & Wright, 2004; Connelly & Kelloway, 2003). At the individual level, knowledge sharing is affected by barriers such as individual’s attitude and willingness, lack of communication skills, lack of time and trust. At the organisational level, the barriers include lack of infrastructure and resources, culture and environment. At the technological level, barriers are correlated to factors such as unwillingness to use applications, unrealistic expectations of IS/IT systems, and difficulties in building, integrating and modifying technology-based systems.

Research studies have indicated that individuals have some reluctance to sharing of knowledge due to personal psychological reason—an individual’s willingness to engage in knowledge sharing is a central barrier for sustainable knowledge sharing activities (Christensen, 2005). Driven mostly by self-preservation instincts, people are unwilling to share knowledge because they perceive knowledge as a valuable commodity that cannot be distributed freely (Ramayah, Yeap & Ignatius, 2013). It is also found that employees retain knowledge ownership to gain recognition among their colleagues (Murray, 2002). Further, self-seeking behaviour and opportunism pose a big challenge for knowledge sharing and lead to knowledge hoarding (Nickerson & Zenger, 2004; Cabrera & Cabrera, 2002).
Lack of knowledge sharing environment is found to be another significant barrier to sharing of knowledge in an organization (Hendriks, 1999; Davenport & Prusak, 1998). Ipe (2003) mentions that culture has a significant influence on knowledge sharing behaviour in organizations. Researchers (Hislop, 2003; McDermott & O’Dell, 2001; Chow, Deng & Ho, 2000; Gurteen, 1999) have discussed the importance of organisational culture in promoting and facilitating knowledge sharing. According to De Long and Fahey (2000), organizational culture influences knowledge sharing in four ways—it shapes assumptions about knowledge; it defines the relationships between knowledge at individual and organizational levels; it creates the context for social interaction; and it shapes creation and adoption of new knowledge. As mentioned by Riege (2005), absence of formal and informal mechanisms that provide continuous support to and improvement of diverse sharing activities also affects sharing of knowledge in an organization.

Knowledge sharing is facilitated by rewards and incentives (Cabrera & Cabrera, 2002; Lindenberg, 2001). Organizational culture must support a system that rewards the sharing and exchange of knowledge. As mentioned by Liebowitz and Chen (2003), incentives can be in the form of recognition, duty or need, a good frame of reference, a sense of give and take (*quid pro quo*), feedback mechanisms for letting knowledge sharers know their knowledge is being put to use, and the pleasure of helping someone attain their goals. Researchers indicate lack of incentives and rewards as a barrier to the sharing of knowledge (Riege, 2005; Al-Hawamdeh, 2003; Bartol & Srivastava, 2002; Hendricks, 1999). However, on the other hand, some researchers have argued that rewards and incentives rarely have an effect on knowledge sharing (e.g. Ellis, 2001; McDermott, 1999; O’Dell & Grayson, 1998; Finerty, 1997).

The major challenge for the managers is to create an environment in which people both want to share what they know and make use of what others know (Riege, 2005). Support and direction from the senior management is a key factor influencing sharing of knowledge. An emphasis on learning and innovation also impacts the knowledge sharing behaviour of the individuals in an organisation. Interaction and collaboration between individuals in an organisation is important as it determines the transfer of knowledge within the organisation and also conversion of knowledge from individual to organizational level (Gold, Malhotra & Segars, 2001).

Lack of trust is another significant factor directly influencing knowledge sharing behaviour (Holste & Fields, 2010; Renzl, 2008; Hislop, 2003; Andrews & Delahaye, 2000). Lack of trust may be because of the fear that others may misuse knowledge or take unjust credit for it, or it may be related to the accuracy and credibility of knowledge (Riege, 2005). The fear of one’s intellectual property being stolen discourages knowledge sharing activities. Research indicates that trust influences an individual’s willingness and desire to share information and ideas (Hendricks, 1999; Davenport & Prusak, 1998). Researchers have also identified time constraint, friction (Szulanski, 2000; von Hippel, 1994), and reciprocity (Nahapiet & Ghoshal, 1998) as sharing barriers.

**Knowledge Sharing in Academic Institutions**

Academic institutions are knowledge-based organizations actively involved in knowledge creation, assimilation and dissemination. These involve activities such as research, teaching, curriculum development, planning and administration (Kidwell, Vander Linde & Johnson, 2000). In a higher education institution, there are two types of knowledge: i) academic knowledge related to the basic purpose of teaching-learning; and ii) organizational knowledge dealing with the functioning of the institution (Yeh, 2005). Knowledge thus exists as tacit knowledge (intuitive and inarticulate) as well as explicit knowledge (codified and documented) (Nonaka & Takeuchi, 1995; Lam, 2000). The idea of a university or an academic institution entails free exchange of knowledge and ideas among the academicians. A study involving public and private universities in Malaysia, by Chong, Yuen and Gan (2014) found the academic staff equally willing to share information and teaching-learning.
materials. Similar findings were reported by Fullwood, Rowley and Delbridge (2013) in a study on academics of universities of UK. According to Hug (2013), models and practices of sharing are not new to education. However, research has often indicated lack of knowledge sharing in the academic community (Ridzuan, Hong & Adanan, 2008; Kim & Ju, 2008; Carroll et al., 2003; Koppi et al., 1998). This is because of the fact that the academicians tend to be independent, individualistic, and autonomous while maintaining an objective distance from the work of their peers (Koppi et al., 1998). Their main focus is on individual academic goals and scholarly achievements rather than common organizational goals. It is often found that because of inherent individualism and exclusiveness the educators have certain inhibitions about sharing of knowledge, ideas and resources, and there is less willingness to share. As mentioned by Stauffer (1999), people cannot be forced to share knowledge. Individuals share knowledge and ideas if they trust that their interests will be guarded and it will benefit them, their colleagues and the organization as a whole (Garfield, 2006; Riege, 2005). Research has indicated that relationships are a determining factor in context of sharing among faculty. Academicians prefer to share knowledge and resources with closest friends (Lima, 1998), others with similar experiences and interest (Little, 1982), and with team members and most importantly trustworthy colleagues (Huberman, 1983).

Educational institutions are laying an increased emphasis on a culture of sharing and collaboration. Significant attention is being paid to the sharing of knowledge and resources among the academia. Institutions world-wide are promoting sharing and reuse of learning resources as Open Educational Resources (OERs). Research studies by Ramayah et al. (2013), Abdullah, Selamat, Jaafar, Abdullah and Sura (2008), Kim and Ju (2008), Mohayidin, Azirawani, Kamaruddin and Idawati Margono (2007), Lou, Yang and Shih (2007), and Maponya (2004) have focused on the importance of knowledge sharing and knowledge management in educational institutions.

**Knowledge Sharing in ODL Institutions in India**

The Open and Distance Learning (ODL) system has emerged as a major contributor towards meeting the rising demand for higher education. In the realm of distance education, at present India has one National Open University and 14 state Open Universities, and above 200 dual-mode universities catering to the educational needs of above 25% higher education students in the country. ODL programmes are characterized by the use of multiple media in instructional design and delivery. In addition to teaching, research and subject/ discipline related work (Kim & Ju, 2008), the faculty is involved in creation of large volumes of course related content, in different formats (such as text, audio, video, animations and so on). The concept of collaborative teaching and learning with sporadic practice of sharing of resources thus produced has mixed practice in the ODL system in the country. In this context, an exploration of knowledge sharing among the faculty becomes all the more significant. Research has indicated that national culture has an impact on knowledge sharing behaviour (Zhang, 2011). Organizational culture, seen as a manifestation of national and societal culture, affects organizational behaviour of the individuals (Kreitner & Kinicki, 2009). Research indicates that, culturally, Indians are not oriented to work cohesively as teams (Gupta, 1991; Roland, 1988) and prefer one-to-one and personal relationships while sharing knowledge (Mishra & Gupta, 2010). This needs further exploration of various aspects involved in the knowledge sharing behaviour of faculty in higher education institutions in India. Most of the past research is focused on various issues related to knowledge sharing and knowledge management in profit-oriented and business organizations. However, research in the area of knowledge sharing and knowledge management in universities and educational institutions, especially ODL institutions in India, is rather limited. Therefore, to fill this research gap, the present study examines the sharing behaviour of the faculty including the barriers to sharing in the National Open University in India.
Conceptual Framework for the Present Study

In the present study, knowledge sharing is discussed in terms of both tacit knowledge (involving skills, ideas and experiences) and explicit knowledge (involving learning resources and instructional materials). An attempt was made to understand knowledge sharing from the point of view of both the dimensions. As mentioned by Ipe (2003), the processes related to knowledge sharing in institutions are very complex. However, based on this work as also on the literature review, as undertaken above, the following were considered as inter-related variables for knowledge sharing:

- interpersonal relations
- organisational structure
- opportunities to share knowledge
- inclination to share knowledge
- misfit between willingness and opportunities to share knowledge
- role of recognition and rewards.

Various aspects related to the field of knowledge sharing and the main barriers to knowledge sharing were examined. Though the present study is descriptive in nature, the key underlying concepts related to knowledge sharing in academic institutions in general and ODL institutions in particular, were then synthesized to form the conceptual framework guiding this study. The focus was on analyzing the main barriers to sharing of knowledge in academic activities at the National Open University. The key factors affecting knowledge sharing were analyzed in terms of:

- Individual inclination (such as lack of interest)
- Institutional culture (such as lack of policy, lack of trust, lack of communication, lack of opportunities for knowledge exchange)
- Institutional support (such as lack of rewards and incentives, lack of infrastructure)
- Personal limitations (such as time, lack of skills and knowledge to share).

The study investigates existing knowledge sharing practices in the National Open University to provide a comprehensive approach towards facilitating knowledge sharing in ODL institutions in India.

Objectives of the Study

The main objectives of the study were:

- To investigate the sharing of knowledge and learning resources among the faculty of the national Open University.
- To study attitude of faculty towards sharing of knowledge and learning resources.
- To identify the perceived barriers and challenges to sharing among the faculty.

In view of the above-mentioned objectives, the present research addresses the following research questions:

- Are the faculty of the national Open University engaged in sharing of knowledge and learning resources?
- How are the faculty of the Open University sharing knowledge and learning resources?
- What are the preferred activities for sharing of knowledge and learning resources?
- What are the perceived barriers to sharing of knowledge and learning resources?
Methodology
The present study is focused on the faculty (teachers and academics) of Indira Gandhi National Open University (IGNOU), the only national open university in India which has jurisdiction to offer programmes all over the country and overseas, and has a cumulative enrolment of about 3 million students. Survey method was used to study the sharing behaviour and barriers to sharing among the faculty members.

Sample
The data for the study were obtained from the members of the IGNOU faculty using the survey method. At the time of study, there were 548 full time faculty members (teachers and academics) in the university in 21 schools of studies, a few divisions dealing with academic matters, and 67 regional centres. A questionnaire (with both structured and open ended questions) was sent to all faculty members of which 65 were returned; of those 62 were found complete in all respects (i.e. 11.2% of all the teaching population).

Survey Questionnaire
A structured questionnaire, prepared on the basis of the review of related studies, was used in the survey. The survey questionnaire contained 19 main questions as:

- demographics (6 questions),
- sharing of knowledge and experiences (4 questions),
- sharing of learning resources (3 questions including an open response question),
- borrowing of learning resources (4 questions including an open response question),
- barriers to sharing among faculty members (1 question with 12 sub- items), and
- feedback on sharing of knowledge and resources (1 open response question).

The questionnaire consisted of dichotomous, multiple choice, ranking and opinion questions. A draft of the questionnaire was sent to 10 experts (working on OER and content repositories in various campus-based and open universities in India). Modifications in the formulation of questions were made before dispatching to the faculty members for responses.

The scale used for barriers had 12 sub- items measured on a three point scale having ‘1’ (as Yes), ‘2’ (as No), and ‘3’ (as Not Sure). The scale had a Cronbach-alpha coefficient of 0.80 indicating high internal consistency of the items.

Procedure of Data Collection
The questionnaire was distributed to the faculty through e-mail. Complete responses were received from 62 faculty members and academics of the university. The data was collected during September–October, 2015.

Data Analysis
The data thus collected was classified, coded and transferred to MS-Excel worksheet for further analysis. The responses were analyzed and interpreted based on the objectives of the study. The findings of the study are discussed in the following sections, though responses to open ended questions have been appropriately discussed at the last (Discussion) section of the paper.
Results

Participant Demographics

As shown in Table 1, out of the 62 respondents, 54.8% were females; 45.2% were assistant professors; the majority (53.2%) were from the 36–45 years age group; more than half (56.4%) had work experience of less than 10 years, and 16.1% had experience of more than 21 years in distance education.

Table 1: Demographic Profile of the Respondents

<table>
<thead>
<tr>
<th>Demographic Status</th>
<th>Items</th>
<th>Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Professional Group</strong></td>
<td>Professor</td>
<td>6</td>
<td>9.70%</td>
</tr>
<tr>
<td></td>
<td>Associate Professor</td>
<td>5</td>
<td>8.10%</td>
</tr>
<tr>
<td></td>
<td>Assistant Professor</td>
<td>28</td>
<td>45.20%</td>
</tr>
<tr>
<td></td>
<td>Assistant Regional Director</td>
<td>17</td>
<td>27.40%</td>
</tr>
<tr>
<td></td>
<td>Other (Category of Academics)</td>
<td>6</td>
<td>9.70%</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>25 years and under</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>26–35 years</td>
<td>12</td>
<td>19.40%</td>
</tr>
<tr>
<td></td>
<td>36–45 years</td>
<td>33</td>
<td>53.20%</td>
</tr>
<tr>
<td></td>
<td>Over 46 years</td>
<td>15</td>
<td>27.40%</td>
</tr>
<tr>
<td><strong>Experience</strong></td>
<td>1–5 years</td>
<td>11</td>
<td>17.70%</td>
</tr>
<tr>
<td></td>
<td>6–10 years</td>
<td>24</td>
<td>38.70%</td>
</tr>
<tr>
<td></td>
<td>11–15 years</td>
<td>11</td>
<td>17.70%</td>
</tr>
<tr>
<td></td>
<td>16–20 years</td>
<td>6</td>
<td>9.70%</td>
</tr>
<tr>
<td></td>
<td>21 years and above</td>
<td>10</td>
<td>16.10%</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td>Male</td>
<td>28</td>
<td>45.20%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>34</td>
<td>54.80%</td>
</tr>
</tbody>
</table>

With Whom Does the Faculty Share Knowledge and Experiences?

As shown in Fig. 1, it was found that 95.20% preferred sharing with academic colleagues from within the School/Division followed by 91.90% preferring to share with academic colleagues from within and outside the institution. Formal networks with registered members (50.0%) and informal networks with informal members (61.30%) were found to be the least preferred options.
What is the Faculty Predisposition for Sharing?

A majority of the respondents (71%) indicated that they indulged in knowledge sharing only when others are interested in reciprocal exchange of knowledge (Table 2). However, 64.50% respondents shared voluntarily.

Table 2: Faculty Predisposition for Sharing

<table>
<thead>
<tr>
<th>Items</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Only when others are interested in reciprocal exchange of knowledge</td>
<td>44</td>
<td>71.00%</td>
</tr>
<tr>
<td>2. Voluntarily</td>
<td>40</td>
<td>64.50%</td>
</tr>
<tr>
<td>3. Only with those who have a high level of knowledge and experience</td>
<td>27</td>
<td>46.90%</td>
</tr>
<tr>
<td>4. Only when I encounter some professional problem</td>
<td>26</td>
<td>43.50%</td>
</tr>
<tr>
<td>5. Only when others encounter some professional problem</td>
<td>22</td>
<td>35.50%</td>
</tr>
</tbody>
</table>

How Do they Share Knowledge and Experiences?

The study revealed that majority of the respondents used phone (82.30%) for knowledge sharing followed by 75.80% participating in seminars and workshops. E-mails were used by 72.70% respondents (Fig. 2). It was found that webinars, video conferences and social media were the least preferred means for knowledge sharing.
Figure 2: Means of Sharing Knowledge and Experiences

*What are the Preferred Knowledge Sharing Activities?*

The study revealed that publishing books, journals and other academic materials was the most preferred knowledge sharing activity, with a majority of the respondents (83.90%) being involved in it. This was followed by informal discussions and sharing of research findings at 69.40% each (Fig. 3).
Do they Share Learning Resources?

Majority of the respondents (96.8%) affirmed that they generally shared learning materials. The largest percentage of faculty (91.90%) preferred to share learning resources with academic colleagues from within the School / Division (Fig. 4). This was followed by sharing with academic colleagues from within and outside the institution (77.40%). Wiki or Twitter were found to be the least used channels for sharing of learning resources with only 22.60 (88.70%).

Figure 4: Sharing of Learning Resources

Do they Borrow Learning Resources?

Majority of respondents (96.80%) indicated that they used teaching or research materials produced by others. Further probing suggested that a majority of the respondents (90.30%) used resources openly available on the Internet. This was followed by academic colleagues from within the School/ Division (75.80%), from within the institution (72.60%) and from other institutions (69.40%). Only 45.20% respondents indicated the use of social networks like Blog/ Wiki/ Twitter for borrowing of learning resources (Table 3).

Table 3: Borrowing of Learning Resources

<table>
<thead>
<tr>
<th>Items</th>
<th>No of Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Resources openly available on the Internet.</td>
<td>56</td>
<td>90.30%</td>
</tr>
<tr>
<td>2. Academic colleagues from within the School/ Division.</td>
<td>47</td>
<td>75.80%</td>
</tr>
<tr>
<td>3. Academic colleagues from within the institution.</td>
<td>45</td>
<td>72.60%</td>
</tr>
<tr>
<td>4. Academic colleagues from outside the institution.</td>
<td>43</td>
<td>69.40%</td>
</tr>
<tr>
<td>5. Websites such as Slideshare or YouTube.</td>
<td>42</td>
<td>67.70%</td>
</tr>
<tr>
<td>6. Social network like blog/Wiki/Twitter.</td>
<td>28</td>
<td>45.20%</td>
</tr>
</tbody>
</table>
Usage of Learning Resources

The study revealed that majority of the respondents (69.40%) adapted resources to meet their academic requirements, and 59.70% indicated using online resources made available by others while taking care to use only copy-right free resources (Table 4). This was followed by 50% respondents indicating that they use whatever is required for from the online resources made available by others, without any consideration of copyright issues. The respondents preferring to use their own resources and preferring to work individually were found to be only 32.30%.

Table 4: Use of Learning Resources

<table>
<thead>
<tr>
<th>Items</th>
<th>No of Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I adapt resources to meet my needs.</td>
<td>43</td>
<td>69.40%</td>
</tr>
<tr>
<td>2. I use online resources made available by others for my teaching requirements but take care to select only copyright-free resources.</td>
<td>37</td>
<td>59.70%</td>
</tr>
<tr>
<td>3. I use whatever I need from the online resources made available by others.</td>
<td>31</td>
<td>50.00%</td>
</tr>
<tr>
<td>4. I use resources from someone I know and trust.</td>
<td>30</td>
<td>48.40%</td>
</tr>
<tr>
<td>5. I use my own resources and prefer to work individually.</td>
<td>20</td>
<td>32.30%</td>
</tr>
</tbody>
</table>

Barriers to the Sharing of Knowledge and Learning Resources

The respondents were asked to identify, on a 3-point scale (where ‘1’ = Yes, ‘2’ = No and ‘3’ = Not Sure), what they considered to be the most significant barriers from a list of 12 barrier statements. These are summarized in Table 5 in rank order for ‘yes’ responses. The greatest barriers identified were lack of proper recognition and rewards, absence of an institutional knowledge culture, and lack of faculty interest in sharing. This was followed by poor understanding about the copyright related practices. A considerable percentage of respondents (50%) mentioned that lack of time was not a barrier to sharing of resources for them. Similarly, 46.67% of the respondents indicated that there was no lack of supportive colleagues, though 36.67% of the respondents reported that institutional decision makers did not value sharing of resources among faculty and others.

Table 5: Barriers to Sharing

<table>
<thead>
<tr>
<th>Items</th>
<th>Yes</th>
<th></th>
<th>No</th>
<th></th>
<th>Not Sure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>N %</td>
<td>N</td>
<td>N %</td>
<td>N</td>
</tr>
<tr>
<td>1. Lack of proper recognition, incentives and rewards for sharing in the institution.</td>
<td>36</td>
<td>60.00%</td>
<td>15</td>
<td>25.00%</td>
<td>9</td>
</tr>
<tr>
<td>2. Absence of knowledge sharing culture at the organizational level.</td>
<td>35</td>
<td>58.33%</td>
<td>15</td>
<td>25.00%</td>
<td>10</td>
</tr>
<tr>
<td>3. Lack of interest in the sharing of resources amongst the faculty.</td>
<td>34</td>
<td>56.67%</td>
<td>20</td>
<td>33.33%</td>
<td>6</td>
</tr>
<tr>
<td>4. Lack of collaborative environment in the institution.</td>
<td>33</td>
<td>55.00%</td>
<td>20</td>
<td>33.33%</td>
<td>7</td>
</tr>
</tbody>
</table>
Discussion and Conclusion

The findings clearly suggest that the faculty of the national open university are actively engaged in sharing of knowledge and learning resources to meet their teaching and learning requirements. The results from the respondents have provided a wider perspective of the knowledge sharing behaviour of the faculty throwing light on the related aspects of the knowledge sharing activities. The findings suggest that the faculty prefer to share their knowledge and experiences with other academics from within the faculty and institution and also from outside the institution. This is consistent to what Collinson and Cook (2004) suggested, that the faculty decision to share is influenced by norms of equality and reciprocity. Moreover, one study suggests that people are five times more likely to turn to friends and colleagues for answers to their problems rather than to other sources of information (Cross & Baird, 2000).

The findings indicate that 65% respondents are engaged in sharing voluntarily. Previous research indicates that individuals are more willing to share knowledge than anticipated (Wasko & Faraj, 2005; Adler, 2001). As opined by Stauffer (1999), creating and sharing knowledge are intangible activities that can neither be supervised nor forced out of people. These activities happen only when people cooperate voluntarily. The findings reveal that feedback in the process of knowledge sharing and exchange is highly valued by the faculty, as also can be seen in the following responses to open-ended question:

*It gives me broader perspective of understanding by receiving feedback.*

*Exchange of knowledge helps in constructing the knowledge and comprehension to solve problems in particular situation.*

The results show that a majority of the respondents use phone followed by seminars, workshops, public lectures, conferences and training programmes for knowledge sharing. E-mail was also used by a large number of respondents. However, the use of blogs, social media webinars and discussion forums was found to be comparatively less. Previous research (Cheng, Ho & Lau, 2009; Kim & Ju,
Sharing of Knowledge among Faculty in a Mega Open University

2008; Cabrera & Cabrera, 2002) has stressed on the importance of open and frequent contact opportunities such as seminars, workshops, and other small group meetings to facilitate exchange of ideas, opinions, and knowledge among faculty members. The need for an open platform for knowledge exchange has also been stressed by the respondents in response to the open ended question:

Institution should have a platform either online or face-to-face to share knowledge.

The findings suggest that academics were engaged in publication as the major knowledge sharing activity. The result is consistent with the findings of a research conducted in an institution of higher learning in Malaysia (Nossuora & Hasan, 2010).

The study investigated into what inhibited the academics from sharing of knowledge and learning resources. It was found that lack of proper recognition and rewards, absence of knowledge sharing culture, and lack of interest in sharing were ranked as the main barriers. Previous studies (Kim & Ju, 2008; Jain, Sandhu & Sidhu, 2007; Riege, 2005; Al-Hawamdeh, 2003; Earl, 2001; O’Reilly & Pondy, 1980) have identified reward system, and incentives (Lou, Yang & Shih, 2007) as a significant factor affecting knowledge sharing. A recent study on knowledge sharing in academic institutions in Malaysia found that appropriate incentives and reward mechanisms, even if they are in the form of recognition by the institution, are crucial for creating a conducive knowledge sharing environment (Cheng, Ho & Lau, 2009). The results of the present study are consistent with the findings of previous studies (Ramayah et al., 2013; Sohail & Daud, 2009; Bock & Kim, 2002) that have suggested the influence of organisational culture on knowledge sharing behaviour. Organisational culture is “perhaps the most difficult constraint that knowledge managers must deal with” (Davenport, De Long & Beers, 1997). Stoddart (2001) argues that knowledge sharing can only work if the culture of the organization promotes it. The study by De Long and Fahey (2000) shows that culture influences knowledge sharing by as much as 80%. Lack of interest of the faculty in knowledge sharing is an indicator towards the need for motivation for sharing. The need for culture is also highlighted by the responses to the open-ended question:

Culture has to be created in the institution.

Sharing of resources and knowledge should be encouraged by the institution.

Sharing of knowledge and resources should be improved to establish a healthy academic culture in the institution. Also, due credit must be given to those who are willing to share.

As for the National Open University, it is found that there is near absence of an organized institutional culture of knowledge sharing in as much as there is lack of any official recognition and reward system for doing so. Moreover, for quite some time, the open resource repository (i.e. e-Gyankosh), once freely available to one and all, had been withheld (which in a way contradicts open sharing).

Lack of knowledge about copyright and available licensing options has also emerged as a prominent barrier. Open responses by the respondents also highlight this aspect, which could be addressed by providing training programmes:

This is an area where more awareness needs to be created. Many people have doubts about IPR issues which they would like to clarify before engaging in sharing of educational resources.

Training sessions should be organised regarding copyright and plagiarism – to clarify the doubts.

In an earlier study on the national open university, Panda and Mishra (2007) had reported that significant barriers to e-learning perceived by the faculty included access to technology and training on e-learning, followed by institutional policy and instructional design on e-learning. The findings reported in the present paper could also be seen in conjunction with two other works being carried...
out by the authors (Santosh, 2012; Santosh & Panda, 2016). Santosh & Panda (2016) in a recent study found a strong positive inclination among the faculty towards knowledge sharing. They also stressed the need for proper training and awareness on IPR and copyright issues for facilitating sharing and re-use of resources.

The findings of the study suggest that the faculty preferred colleagues rather than networks to share with. This could be attributed to a culture of self-sufficiency and also to a latent fear of external scrutiny. The findings also reveal that voluntary sharing was much less; publishing was most preferred over sharing through social and professional networks. Use of Internet for resource use was frequent though use of networks was minimal, as also use of own resource. These could suggest a conservative and protective mindset, and dependency on others (even if the principle of OER sharing suggests one can use freely as long as one can contribute freely). The current mindset, developed over a period of time in the institution, is seen as a result of barriers like lack of proper recognition and incentives, absence of organizational knowledge sharing culture and collaborative environment, lack of awareness of copyright issues, and lack of adequate infrastructure.

Following the initial stages of the development of the university, resource sharing with the society, especially the students and faculty, was seen as a progressive and democratic step. The creation of the first national resources repository (E-Gyankosh) by the university was a pointer to this direction (for open sharing of print, audio, video, and multi-media course materials). Contrary to OER movement getting momentum globally, the university later decided to abandon open sharing, thereby legitimizing the dogmatic view of a few. However, recent developments towards openness are very encouraging—this can sustain only when policy decisions and operational provisions are made appropriately.

The study highlights the existing knowledge sharing culture in an open university, at the same time stressing the need for strong institutional support mechanisms in the form of opportunities for knowledge exchange and provision of rewards and recognition, thus creating a sound but open academic culture. Proper trainings with respect to IPR and copy right issues will create the awareness among the faculty thus inculcating the confidence to share. The study was limited to only a single open university in India and had a small sample size of 65 faculty. However, the findings are indicative enough to encourage the existing positive attitude and individual use of knowledge sharing on one hand, and build in conducive policies and institutional culture towards knowledge sharing (including continuous awareness and training interventions) on the other.

References


Examining Student Perception of an Open Statistics Book

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Abstract

The rise of Open Educational Resources (OER) research provides data that Open Textbooks and other forms of OER may be one cost saving approach for college and university students. Yet little research has been conducted around the attitudes and perceptions of the students using these Open Textbooks. This paper examines the perceptions that students have of the different versions of an open statistics textbook used over several years in one community college. Survey results show that students generally had at least as good of an experience using the open textbook compared to traditional textbooks. Suggestions for further research are discussed.

Keywords: Open educational resources; open textbooks; electronic textbooks; open access; mathematics education; introduction statistics

Introduction

For community college students, textbook expenses and course supplies can be more expensive than tuition and fees. For example, two twelve-credit semesters of tuition at California community colleges cost $1104. If students take a total of ten classes, and those textbooks cost an average of ninety dollars each (Hilton, Robinson, Wiley & Ackerman, 2014), their textbook costs will approach that of tuition. Reducing costs of education can aid students in lessening their debt and potentially help them complete their education faster. Shrinking college budgets may make decreasing tuition costs difficult; however, there are promising possibilities in terms of lowering the costs of textbooks. Open Educational Resources (OER) are one possible answer to lowering the cost of student educational expenses. OER are 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” (Hewlett, 2013).

One of the best-known and earliest examples of OER is the Massachusetts Institute of Technology (MIT) OpenCourseWare program. This program increased access to MIT’s teaching materials and has expanded to a variety of websites where OER are available for teachers to use as substitutes for traditional textbooks. In the past decade, many OER have been made available, and today, many websites provide college instructors with the ability to locate OER that could be substituted for traditional learning materials. Because textbooks are traditionally used as a staple in college...
courses, open textbooks, a subset of OER, are among the most useful OER to potentially use in
the college classroom. The Minnesota Open Textbook Library (http://open.umn.edu/opentextbooks/)
and California's Cool4Ed project (http://cool4ed.org/) are examples of searchable directories of open
textbooks that include faculty reviews of these textbooks. Yet little research has been conducted to
understand the student perceptions and attitudes of those actually using the OER textbooks.

The purpose of the present study is to examine student perceptions of different versions of an
open statistics textbook over several years at a community college in California. The overall research
questions for this study are:

1) What are student’s perceptions of overall quality of an open textbook compared to traditional
textbooks?
2) What are student’s perceptions of cost of an open textbook compared to traditional textbooks?

We begin with a review of literature of open textbooks broadly and then provide specific background
on the textbook that is the focus of the present study.

Review of Literature

Open Educational Resources

In addition to the above mentioned definition of OER, the phrase “Open Educational Resources”
has also been characterized as, “The open provision of educational resources, enabled by information
and communication technologies, for consultation, use and adaptation by a community of users for
overview regarding the history of OER, including some challenges to OER such as business models
of sustainability and discoverability. However, one clear and immediate advantage of open textbooks
is cost-savings to students, who spend approximately $90.00 per class on textbooks (Hilton et al.,
2014). Yet, for faculty members who make decisions about which textbooks to adopt, more is
required than simple cost savings; for them, other factors such as student performance may be the
most vital issue. Thus, Allen and Seaman (2014) found that college professors rate “proven efficacy”
and “trusted quality” as the two most important criteria for selecting teaching resources.

Several studies indicate that OER have similar efficacy to traditional textbooks. For example,
Allen, Guzman-Alvarez, Molinaro and Larsen (2015) examined an OER that was substituted for a
chemistry textbook. An experimental class of 478 students used the OER, while a control class of
448 used a traditional textbook. In order to minimize confounding variables, these two classes were
 taught by the same faculty member and teaching assistants. Both sets of classes used identical
midterm and final exams and were taught at back-to-back hours. The researchers also used pre-
tests at the beginning of the semester to determine that there were no significant differences
between the groups. Although there was a large difference in the cost of the resources, the
researchers found no significant differences in the tests scores between the two groups. Hilton
(2016) reviewed eight additional efficacy studies focusing on OER and determined that, in general,
students perform as well or better when OER are implemented.

Hilton (2016) also reviewed nine studies where teachers and/or students share their perceptions
about the quality of OER. A general finding from these studies is that approximately half of teachers
and students find OER to be of equal quality with traditional textbooks, with a larger number of
students and faculty reporting that OER had higher quality than traditional textbooks than those
who stated that traditional learning materials had higher quality.

Many of the studies regarding student and faculty perceptions of OER ask for the opinions of students regarding several different textbooks, or in some instances, a small sample discussing a single text (e.g., Petrides, Jimes, Middleton-Detzner, Walling, & Weiss, 2011; Lindshield & Adhikari, 2013). This present study was designed to examine student perceptions of quality of a single OER textbook, originally known as Collaborative Statistics, across several years and versions. We next describe the history and background of Collaborative Statistics, later renamed Introductory Statistics, the textbook that is the subject of the present study.

History and background of Collaborative Statistics

Elementary Statistics at De Anza College is generally considered to be a service course. Students planning on transferring to a California public university are required to complete a college level mathematics course before transfer. Many majors, excluding engineering and mathematics, require this particular algebra-based statistics course. In addition, as the course can be used to satisfy most other majors’ mathematics graduation course requirements, Elementary Statistics has become the default college level mathematics course for non-STEM (science, technology, engineering and mathematics) students.

Barbara Illowsky and Susan Dean (now retired), mathematics faculty at De Anza College in Cupertino, CA, have been teaching introductory statistics courses for over 25 years to hundreds of students each year. In the mid-1990s, they wrote Collaborative Statistics, a textbook that incorporated technology, multiculturalism, collaborative learning, writing answers, data driven problems, and was at a reading level suitable for English Second Language students.

In 2006, FHDA and Connexions (a division of Rice University) received a grant from The William and Flora Hewlett Foundation to develop a prototype community college OER textbook, as well as train educators in the adoption and use of open textbooks. Dean and Illowsky worked with the Connexions team to produce the OER textbook in an attempt to produce a high quality open text that could be a positive disruptor in the market. Students and faculty were able to access the book freely from the Connexions site, print their own text, modify the text to suit the needs of individual faculty members, or purchase a hard copy version (Illowsky & Dean, 2008).

The pace of innovation accelerated as an ecosystem around OER evolved. The level of innovation around the original work has greatly exceeded the textbook authors’ expectations. One such way was the multiple industry innovations derived from the book, such as the iBook textbook version, Kno version, WebAssign’s learning system integration, and a new edition of the textbook called Introductory Statistics that was published by OpenStax College in 2014. Collaborative Statistics/Introductory Statistics became the prototype for OpenStax College’s open textbook model. Dr. Richard Baraniuk (2016), OpenStax College at Rice University said, “This is the project that really started it for us. I doubt that we would be reaching nearly 1,000 adoptions, hundreds of thousands of students, and millions of web learners if it weren’t for Collaborative Statistics.”

Differences between Collaborative Statistics and Introductory Statistics

Introductory Statistics is an updated version of the original Collaborative Statistics. The original text was in black and white only. The printed version appeared as black and white, camera-ready text. The online version was ADA compliant, but still without color. OpenStax College added color and formatting to give the appearance, both online and when printed, of a more traditional textbook. OpenStax College upgraded the graphs and images. It also provided more examples, narrative, and editing. In addition, faculty using the text from a variety of colleges around the United States
provided features, narrative, examples and feedback. The final *Introductory Statistics* is a more community-developed, professional, open textbook than the original version (OpenStax, 2013).

To date, one study has been performed on this textbook. Petrides et al. (2011), surveyed instructors and students who used *Collaborative Statistics*. In total, 31 instructors and 45 students shared their perspective on *Collaborative Statistics*. “Cost reduction for students was the most significant factor influencing faculty adoption of open textbooks” (Petrides et al., 2011, p. 43), partly because it increased student access. Researchers also found that 65% of students surveyed reported a preference for using open textbooks in the future because they stated that they are generally easier to use. Our purpose in this study is to further examine the perceptions that students have of the different versions of this textbook over several years.

**Methods**

The research in this present study was conducted between 2013–2015 on student use and perceptions of *Collaborative Statistics* and *Introductory Statistics* at De Anza College. De Anza College is a large suburban community college in California, located in the region known as Silicon Valley. It operates on the quarter system. The college serves approximately 23,000 students (over 40% full-time). Locally, it has the highest graduation rate (associate degree) with over 60% of its full-time students earning the degree within three years. Asians (38%) and Latinos (24%) are the two largest ethnic groups at the college. To evaluate student perceptions, a questionnaire was developed to identify the student assessment and perceptions of the open textbook. The initial surveys were on the book when it was known as *Collaborative Statistics*, with the final survey being done on the later version of the book, known as *Introductory Statistics* produced by OpenStax College.

**Collaborative Statistics Version of the Textbook**

The initial questionnaire was sent to all of the students who used this text in the spring and fall 2013 quarters at De Anza College to participate by filling out a survey questionnaire. Requests were made via an email, which contained a link to the questionnaire. The requests were sent to statistics instructors towards the end of each respective term, after the last date for students to withdraw from the course, with an invitation for them to pass the questionnaire on to their students. Seventeen out of a possible 28 different instructors had students from their classes that submitted responses. The questionnaire included multiple-choice, multiple-response, and text entry questions. This survey was based in part on a survey utilized by Bliss, Hilton, Wiley & Thanos (2013).

**Student Questionnaire**

While taking the questionnaire, students would see between sixteen and nineteen questions depending on the answers they chose. No responses were mandatory, so a student could skip any of the questions if they chose to do so. The first few questions were basic demographic questions (e.g. instructor, gender). The next questions asked about students’ financial situations, such as if they had received loans, Pell Grants, or fee waivers to fund their education. Other questions asked about student textbook usage, both in general and specifically in their statistics class. The last group of questions inquired about students’ usage and perceptions of the open statistics textbook. Two questions inquired how often they used the textbook and what version they used most. Another examined how they would rate the quality of the text as compared to other textbooks and then asked them to comment briefly on their response. The questionnaire did not explicitly define the
term “quality,” which was left open to student interpretation in order to accurately capture their perceptions. Other items asked students to comment on what they liked best about the text, as well as their biggest complaints. The final questions probed students to explain their overall opinion of the text, as well as how likely they were to consider taking another course that used this kind of text. We used descriptive statistics to analyze the quantitative data and emergent coding to identify themes from the qualitative questions.

Results

Demographics
Of the 231 students who completed the survey in 2013, 126 were female (54%) and 106 were male (46%). Twenty students (9%) had received loans to fund their education, and 85 (37%) had received Pell Grants or fee waivers.

Student Perception of Cost
As mentioned previously, the text for this course was offered free of charge online; however, there was also a hard copy available for purchase for under $30. Forty-eight percent of students reported purchasing a text for this class. The rest of the students either used the online version or printed off a PDF copy of the text. Of the 56 students who reported purchasing texts, all but eleven reported spending $100 or less, and 57% reported spending under $40. Considering the cost of the hard copy, the “$100 or less” could refer to one instructor whose students purchased the optional hardcopy note pack from the campus bookstore instead of downloading and/or printing them.

Many students (61%) reported printing materials for the course. Of those who did, 82% reported spending $30 or less, with 46% spending less than $10. Many students reported that they did not purchase any texts for the course. When we asked them why not, the vast majority of them (84%) answered “the text was available free of charge online.” In an answer to our second research question of student perceptions about cost of OER, our findings indicate that whether students purchased a hard copy of the text or printed off pages, it appears that most students experienced significant savings relative to the average costs of college textbooks.

Student Perception of Quality
In order to answer the first research question of overall student perceptions of the OER textbook being used, a variety of questions were asked and analyzed. One indicator of text quality may be the frequency of student use. We asked students how often they normally use books in all their classes. More than half of students (66%) reported that they used their textbooks at least twice a week. When asked how often they used the textbook for this course, 65% reported using it twice a week or more. Thus, these students used this text about as much as they would any other textbook.

When specifically asked how they would rate the quality of this text as compared to other textbooks they have used, 143 (62%) said that it was the same as books in their other courses, 57 (25%) rated it as better than other texts and 31 (13%) rated it as worse than other texts they have used. This finding is similar to other research on the perception of open textbooks (Bliss et al., 2013). Figure 1 illustrates percent responses from students as to the quality of this text compared to a traditional text.
When students were asked to imagine a future course in which there were two sections, one offering traditional printed texts and the other offering texts such as the one they used in this course, 50% of students said they would choose the class with texts like those offered in this course. Only 19% said they would enroll in the course with the traditional printed text, and the remaining 32% said they would have no preference. Similarly, when asked how likely they were to register for future courses using books like this one, 73% of students said that they were either “somewhat likely” or “very likely” to do so. Thus, in each case, it appears that students generally had a favorable view of the textbook.

In order to gauge the reasons behind the answers the students gave, we asked them to provide answers to free-response questions designed to help us understand what aspect of the textbook were appealing (and not appealing) to students. Students who rated the textbook quality as lower than average believed that the textbook lacked clarity and organization. For example, one student said, “[The textbook] was very confusing to understand exactly where everything was, and I had a hard time finding something when I needed it.”

In contrast, students who rated the textbook quality higher than average offered different opinions when they were asked why they rated the textbook highly. When asked what made it better, their comments fell into two main categories: clarity and examples. Examples of positive student comments about the text are as follows:

- “The examples and summary pages were the most helpful portions and worth the 26 dollars to actually purchase the text.”
- “The book is written simply and clearly. This made it easy to understand and less ‘taxing’ to read. The collaborative aspect of the course built in the text encourages group learning which I have found to be beneficial to my learning.”

Figure 2 illustrates comparisons between the first two free-response questions: “What made it better?” and “What made it worse?”
In addition to the foregoing questions, students were also asked a free-response question regarding what they thought of the text overall. We divided their responses into positive, negative, and neutral comments. The negative comments fell into three main categories: clarity, relevance, and examples. For purposes of this analysis, we have defined relevance as how well the text fit in with students’ classes. Some examples of negative relevance comments follow:

- “It needs improvement as our instructor substituted material for chapters that were not very comprehensive.”
- “It was a good text but not good enough to rely on for the sole purpose of learning, I prefer teacher notes since it simplifies everything for me.”
- Some examples of negative student comments about the text’s clarity follow:
  - “Overall, this text is ok. It was simple to understand in the beginning, but then got too complicated for an Intro to Statistics book. It needs to be simplified a bit more.”
  - “I find reading the textbook necessary but very dull and not very engaging so it makes it hard to focus on the information being provided.”
- Examples of negative comments about the examples used in the text are as follows:
  - “The answers to the homework needed to be a bit more robust; I noticed that the questions that were qualitative did not have sentence answers, which made it difficult for me to gauge whether I was understanding the material (vs. following the formulas provided).”
  - “Too many examples, not enough explanation of the problems.”

The positive comments to the overall question mainly fell into three categories (other than general comments such as “Good,” “Great,” etc.). These categories were Examples, Clarity, and Organization. Sample positive comments regarding “examples” are as follows:

- “I think it was a good choice for this course. It had a good variety of homework problems and labs that appeal to most of the students.”
- “Many examples are given to illustrate the topics discussed.”
- “I liked all the examples given because they were very alike with the homework problems.”
The following are examples of positive statements regarding the “clarity” of the textbook:

- “I like that is written in simple words that everybody understands.”
- “I was pleasantly surprised with how concise and un-confusing the language and examples were.”
- “I loved the textbook that is currently being used. It is easy to understand the theories, formulas, and the examples.”

Sample comments representing student statements about Organization are as follows:

- “It was easy to use and the format was nice!”
- “Easy to navigate.”
- “I appreciated it because the objectives were clear and the examples followed the objectives.”

All neutral answers given to this question were coded as “general.” None of them focused on anything specific about the text; but rather were statements such as, “Okay,” “It was all right,” “It’s the same as the others.” Figure 3 illustrates the answers to the question “Overall, what did you think of the text used in this course?”

Two final open response questions were utilized in order to help students elaborate on their feelings regarding the textbook. First, in order to prompt students to record any negative impressions of the textbook, students were asked about their biggest complaint regarding the textbook. Responses to this question were similar to those negative comments described previously.

In responding to the question “What do you like best about this text?” students’ answers fell mainly into three categories: examples, online benefits, and price. Statements regarding examples were similar to those discussed previously. Student comments with regard to online benefits are illustrated by the following comments made by the students:
“Free...I have attended other institutions and this course is the first one that offered a free textbook. I am very appreciative both of the access to knowledge in a form that is digital, online and hard copy. Also, cost is prohibitive for textbooks sometimes, and not having to pay for textbooks is a direction I’d like to see education move towards.”

“‘It has an online component to it, so I don’t have to carry it around all the time.’

“I liked the fact that it was online the most because I didn’t have to go out and buy/rent a heavy textbook to uselessly keep or return once I finished the class.”

“The convenience, I liked that it was available online.”

Representative examples of comments regarding price include the following:

“It is free and it is just like regular textbooks.”

“I would recommend the text to future students. I loved how students had a choice between downloading the free text and/or owning the hard copy. The course material felt really accessible for low-income students, like myself, who often can’t afford expensive texts, and have to wait several weeks into the course to buy one.”

Figure 4 summarizes the answers between the first two free-response questions: “What made it better?” and “What made it worse?”

![Like Best v. Biggest Complaint](image)

**Figure 4: Comparison of Student Complaints Versus Favorite Aspect of Collaborative Statistics (absolute counts)**

**Introductory Statistics Version of the Textbook**

In the spring of 2015, seventeen teachers at De Anza College used a revised OpenStax version of the textbook now called, *Introductory Statistics*. We invited those teachers to survey their students regarding their perceptions of the textbook. In total, students from nine of those teachers completed the survey; and 94 students in total completed the survey. A strong majority of the respondents (68%) all came from one class.

Demographics were similar to the previous results. 54% of respondents were male, and 46% were female. 13% of students had received loans to fund their education and 41% had received
Pell grants or fee waivers to fund their education. Seventy percent of students stated that they did not purchase any textbooks for this class; their reason for not purchasing the textbook was primarily because the textbook was available for free online.

While only a minority of students purchased the textbook, a slight majority (53%) did print text materials for the course, with about two-thirds of students reporting that they spent less than $20.00 on their printing costs. In terms of how students accessed the book, 47% used the book online, 23% downloaded a PDF, and 31% used a hard copy.

In answer to the question, “How would you rate the quality of the texts used for this course?” 70% said it was about the same as the quality of the texts in their other courses, 23% said it had better quality and 7% said that it was worse. Only five students gave specific responses to the question, “Why did you rate the OER textbooks as being worse than traditional texts” and there was no observable pattern in their responses. Some felt there were errors; others felt it was too difficult to understand. Figure 5 illustrates percent responses from students as to the quality of this text compared to a traditional text.

Sixteen students shared their perceptions on what made the open textbook better. These responses were categorized in three groups: clarity, cost, and convenience. For example, one student said, “[It was] easier for me to access, I could search information that I needed instantly, and it was free. I didn’t have to worry about buying another expensive book that I would only use once and sell for less than half of what I bought it for.”

Participants were asked, “Overall, what do you think of the text used in this course?” All neutral answers given to this question were coded as general, and, as stated previously, were generic answers such as “It’s okay.” Figure 6 illustrates the answers to the question “Overall, what did you think of the text used in this course?”
Discussion and Conclusion

Student perception of textbooks, in general, is quite subjective. Opinions of clarity, for example, may be tied to students’ overall comprehension of course content. *Elementary Statistics* at De Anza College is mostly a required service course that students do not want to take. Both negative and positive textbook opinions can be based upon like or dislike of the course, in general, as well as course grade. The authors attempted to have students to focus specifically on using an online, open (free) textbook, in place of purchasing an expensive hard copy text.

Overall, student responses to using both *Collaborative Statistics* and the updated *Introductory Statistics* were positive. For both open textbooks, students overwhelmingly reported the text was the same as, or better than their traditional texts. In response to open-ended questions, both groups of students provided similar comments. The hard copy version of both texts could be purchased for under $30. This cost is significantly less than what it would cost for a student to print out the full pdf of either text as well as purchase a hard copy of a traditional textbook. In general, students who do print can print just the pages that they feel they need in hard copy form. The authors expect that in the future, fewer and fewer students will purchase the hard copy version as online academic reading becomes more prevalent.

One of the limitations of this study, is that while the authors attempted to distinguish between use of a hard copy textbook and use of an open, online textbook in their research, some students chose to purchase the hard copy of the text, and thus may have given responses that were based on the hard copy version of the open textbook. Future research might focus on cost trade-offs of open versus expensive textbooks, as well as low cost (under $40) versus traditionally priced, expensive textbooks. As most classes that previously used *Collaborative Statistics* have now adopted *Introductory Statistics*, and *Introductory Statistics* is now widely used, future research would also benefit from an expanded survey population of multiple institutions and instructors in order to more adequately generalize the findings of the study.
In conclusion, we believe this study adds to a growing body of research that indicates that when it comes to textbook costs, students might not “get what they pay for.” In other words, students appear to perceive the quality of the open textbook to be as good or better than more expensive commercial textbooks. If this in fact the case, professors and educational administrators should carefully consider adopting open textbooks to reduce the high cost of traditional texts.

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Introduction

Our learning has become increasingly mediated by technology and to that effect online education and blended learning in the classroom have become part and parcel of everyday life, whether taking the form of official classwork or in our own independent, interest-driven pursuits. The application of online education is not a one-size-fits-all approach however, nor may it be appropriate for all learners or instances. Means, Bakia, and Murphy have synthesised a variety of resources and topics in the field to present the reader with research that has been conducted regarding the effectiveness of online learning, as well as an engaging overview of what online learning looks like in K-12 and Higher Education, in addition to personal interest and productivity.

The text is divided into 9 chapters that will take the novice through foundational knowledge in the field of online learning all the way through current topics (e.g. Blended Learning, Virtual Schools). The more knowledgeable or focused reader can easily dive into topics of greater interest or personal relevance. As the authors note, the text has been written in such a way that each chapter can stand on its own so that the reader is free to engage with the text in any order or amount that meets their needs.

Structure and Content

The authors establish a foundation for all readers in Chapters 1 and 2 by introducing the landscape of online learning, the inconsistency of terms, and as a result the challenge of a coherent conversation. Rather than suggest yet another typology to describe a quickly changing field, the authors pragmatically provide a set of dimensions for the reader to better contextualize the topics they will encounter in the book: context, design, implementation, outcomes. This particular chapter will be of value for readers without any background knowledge and will prepare them for subsequent topics, while chapter 2 begins by grounding the text in research through an extensive meta-analysis of
studies conducted by the authors that address not only whether or not online education is as effective as face-to-face education, but in what ways it is shown to be associated with more positive outcomes than traditional methods alone. As is suggested by the subtitle of the book of whether, when, or how, there is a host of nuance and as a result there are applications and contexts that are more effective than others, making this chapter an asset for all readers.

Chapters 3 and 5 examine how brick-and-mortar tertiary and secondary programs are extending themselves through online education as well as a synopsis of the origins of current practices and research. Topics range from adaptive instruction, competency-based learning, and MOOCs. This chapter also begins a treatment on blended learning which is covered more extensively in chapter 5 within the context of K-12 education.

Everyday informal learning that occurs online in a more structured way than the casual learner might describe their learning activities is addressed in Chapter 4. The authors describe various forms of self-initiated learning such as online tutoring, help with assignments, gamification, the limitations of current research, as well as aspects of the digital divide that disadvantage certain learners. This chapter may be of less interest to the majority of readers since such learning experiences tend to be ubiquitous if not wholly transparent in the 21st century.

Chapter 6 discusses the rise of 100% online universities and K-12 virtual schools and explores the performance of students in these programs, as well as how these organizations are funded. These institutions generally offer full degrees and aside from the obvious advantages they provide in accessibility, they are not without controversy and the authors fairly represent the complex relationship of profit, access, quality outcomes, financial-aid associated with funding, and the major criticisms launched at typically for-profit fully online institutions.

The learner is brought into focus in Chapter 7 and the authors explore the difficulties associated with designing online learning experiences that meet the needs of an increasingly diverse group of students, particularly those that are not adequately prepared for, or ideally suited for, formally learning online. This is often a paradox for online learning as many learners are ill prepared and ill suited for it, yet, it is commonly a last chance for many that have not been adequately served by mainstream educational outlets.

Lastly, chapter 8 briefly discusses the economics of online learning and asks a fundamental question of whether or not it reduces costs when compared with traditional methods. The authors note the complexity and challenge associated with analysing available data and ultimately offer some general conclusions with the proper perspective as it comes down to how one chooses to compare numbers in the absence of standardised methods of calculating the costs involved. Chapter 9 closes the text as a summary of the previous chapters along with a research agenda for directions of future inquiry.

**Conclusion**

The authors have provided a valuable text that gives the professional and laymen alike a manageable overview of not only the research related to the effectiveness of online learning in various situations and formats, but also of the ways it is manifested in Higher Education, K-12 virtual schools, blended learning in face-to-face classrooms, open universities, and informal learning online. I would recommend the book to those looking for a broad and accessible overview of online learning. Readers looking for a more in-depth treatment of a specific online focus such as only Higher Education or blended learning may be better served by a text more limited in scope. The potential exists for this book to be used as a primary or supplementary resource in an introductory course in online education/distance education. Strengthening the argument to do so is the independent nature of each chapter which allows flexibility and adaptability for any course curriculum.

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