Editorial policies

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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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Brief report on Open Praxis figures and data (2017)

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editor@openpraxis.org

In the first Open Praxis issue in 2018 we briefly report on some statistics and information about Open Praxis development, as we did in past years (Gil-Jaurena, 2015, 2016, 2017). The report covers the period January 2013 - December 2017, with a special focus in volume 9, published in 2017. Table 1 includes different journal statistics, such as number of submissions, number of published papers; acceptance rates; number of authors and number of reviewers.

76 authors (excluding the editor) contributed to Open Praxis volume 9 with their research papers, innovative practice papers or book reviews, a total of 34 published items. Considering the international scope of the journal, contributions are geographically and institutionally balanced, coming from 22 different countries. The 66 reviewers also reflect a gender, geographical and institutional balance, as shown in the list available in the Open Praxis website (http://openpraxis.org/index.php/OpenPraxis/pages/view/reviewer).

Table 1: Journal statistics per year

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<td>Average authors per paper</td>
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<tr>
<td>Number of reviewers</td>
<td>45</td>
<td>53</td>
<td>61</td>
<td>59</td>
<td>66</td>
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</table>

Regarding visitors and readers, figure 1 shows their location. In 5 years (since publication of issue 5(1) in January 15th 2013 until January 15th 2018), the Open Praxis website has received visits from all over the world, being the top ten countries the following (in descending order): United States (15.81% of the visits), United Kingdom (7.30%), Spain (7.15%), India (5.49%), Canada (4.95%), South Africa (4.73%), Palestine (4.20%), Australia (3.58%), Indonesia (2.63%) and Pakistan (2.12%).

According to ClustrMaps.com (https://clustrmaps.com/site/x7ne), Open Praxis had an average of approx. 8000 page views per month in 2017.

About the academic impact, citations to Open Praxis in scientific publications (journals, conference proceedings, books and other specialized works) have progressively increased since the relaunching of the journal in 2013 (figure 2). Open Praxis h-index is 21 (source: Google Scholar, January 15th 2018).
After this brief report, what follows is an introduction to the first *Open Praxis* issue in volume 10, which includes six articles in the research papers section and two innovative practice papers.

In the first article (*Using Future Research Methods in Analysing Policies Relating to Open Distance Education in Africa*), Mpine Makoe, from UNISA (South Africa), presents an analytical lens to various policy documents in Kenya, Rwanda and Zambia that state the vision and aspirations of these regions in their way towards becoming middle-income countries. She explores policy documents related to open and distance education and to the use of ICT in education. The use of interpretive forecasting techniques leads her to characterize the case in each country and to recognize the failures in the process of implementing the policies, particularly in widening access to higher education through open and distance learning.

In the second paper (*Space as a tool for analysis: Examining digital learning spaces*), Michelle Harrison, from Thompson Rivers University in Canada, explores the concept of spatiality from different perspectives, and reflects about what space means in a connected and networked world and which are the implications in digital education and learning. She proposes a spatial lens to analyze the transformation of digital spaces into learning spaces. This framework is meant to support researchers in asking relevant questions incorporating space as a key and under-considered concept.

The next three papers present survey-based studies covering different topics of interest in e-learning: assessment in the first case, and educational resources in the last two cases.

The first study (*Student Perceptions of the Effectiveness of Formative Assessment in an Online Learning Environment*), by Betty Obura Ogange, Kevin Odhiambo Okelo, John Agak and Peter Kiprotich from Kenya, documents a survey-based research undertaken in the Maseno University virtual campus to collect students’ perceptions about a key issue in the teaching-learning process: formative assessment. Questioning about a variety of online assessment tools and feedback, the study shows students’ preferences, which are a valuable input in the design of future assessment and feedback methods in online courses.

The second survey-based study (*Implementation Factors and Faculty Perceptions of Electronic Textbooks on the iPad*), presented by Michelle Dawn Rogers-Estable from the USA, was developed in 17 campuses in the United Arab Emirates where eTexts were introduced simultaneously using various digital platforms. The study considers the Technology Acceptance Model (TAM) and collects faculty perceptions about the experience and identifies barriers to the use of eTexts, including access, interactivity and other technical issues. As a result, only 30% report that using eTexts is an improvement comparing to paper texts. The findings are of interest for faculty and eText producers.

The last survey-based study (*Acceptance and Usability of OER in India: An Investigation Using UTAUT Model*), by Nayantara Padhi from IGNOU (India), also collects faculty perceptions and uses the Unified Theory of Acceptance and Use of Technology (UTAUT) model. It is focused on open educational resources in 22 universities in India, and among the findings it is worth to mention that faculty are aware of OER but don’t use them so much, despite there is a will to do so. The paper identifies a set of barriers to the use of OER, as well, which is of interest for establishing strategies to increase the use of OER.

In the last paper in this section (*MOOCs for Teacher Professional Development: Reflections and Suggested Actions*), Pradeep Kumar Misra from India compiles different views and inter-relations between two current issues: teacher professional development and MOOCs. He explores different initiatives and advocates for using MOOCs for teacher professional development, addressing actions at different levels: policies, technical and operational issues, MOOC initiatives, language and cost barriers, “MOOC culture”, and research.
The innovative practice papers section opens with *Online educators’ recommendations for teaching online: Crowdsourcing in action*, by Joanna C. Dunlap and Patrick R. Lowenthal from the USA. They relate an ample set of recommendations, collected among practitioners of online education in a participatory way. Organized into four themes that arose from the data—student support, content structure, presence and preparation—the recommendations align with the Community of Inquiry (CoI) model. The use of crowdsourcing appears as an innovative research methodology to be considered.

Finally, an international team composed by Rajan Madhok, Erica Frank and Richard Frederick Heller from the United Kingdom, Canada and Australia respectively, present *Building public health capacity through online global learning*. Departing from a need to implement new models for training public health workforce, they suggest online and collaborative learning as an innovative approach. They illustrate it with two examples and reach a conceptual model for global learning, which can be useful for other educators willing to go beyond boundaries and making good use of digital tools.

We hope these contributions will invite to reflection and innovation in open, distance and flexible education.

Special thanks from *Open Praxis* to the authors and reviewers who have contributed to this issue.

**References**


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Using Future Research Methods in Analysing Policies Relating to Open Distance Education in Africa

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Abstract

Many African countries have developed policies to reform their education system in order to widen participation in higher education. To achieve this, open, online and distance education based models have been advocated as the most viable delivery tools in expanding access to higher education. However, the policy analysis of Kenya, Rwanda and Zambia revealed that the integration of open, online and distance education in these countries’ education systems is inadequate. The purpose of this study is to analyse policies in order to determine why policy goals are not achieved and how the present reality and the past knowledge impacts on the desired outcome. The future research methods of forecasting is used because it looks at policy interventions with the aim of assisting us to understand probable development in education that may have led to the weak implementation of the policies.

Keywords: Policies; Open Distance Education; Futures Research; ICT for Education; Forecasting

Introduction

National education policies play a critical role in advancing educational goals of the country because they emphasize the importance of anticipating the future. They are developed to provide a vision of what the education system should look like in future (Kozma, 2005; Pavlova, 2013). National education policies are strategic in nature because they provide a planetary vision of where the country wants to be or might be (Pavlova, 2013). Hence, they are considered desirable by the state because they tend to focus on the national social development goals and economic needs of the country (OECD, 2003). Without national policies, the education sector will not be able to determine what to prioritize in the face of many national priorities (Kozma, 2005). Therefore, education policies, unlike many other government policies are drawn up to support economic growth; promote social development; and advance educational reform (Kozma, 2005; Nasruddini, Bustemi & Inayatullah, 2012; OECD, 2003).

The nature of education is future-oriented because its role is to equip students with knowledge, skills, and attitude that it is hoped will be useful in future. Most education policy goals, therefore, tend to focus on the human resources development needs. The future of economic development depends on people who are equipped with competencies and skills that are needed for the knowledge economy (OECD, 2003; Rwamatwara, 2012). In an effort to facilitate the implementation of an education system that has the potential of increasing the much needed high level skills and capacity, national policies were developed to position education and training at the center of social economic development goals of the country (Kozma, 2005; OECD, 2003). To ensure the sustainability of economic growth, higher education institutions are expected to open up opportunities and provide education to large numbers of people (Altbach, Reisberg & Rumbley, 2009; GEM, 2016). The rationale for providing education at this scale is more critical in African countries where there is a huge need for skilled and trained workforce to enhance economic growth and global competitiveness (Rwamatwara, 2012).
If skills shortages are not addressed, many African countries will not realise the 2030 Sustainable Development Goal towards an inclusive and equitable quality education and lifelong learning for all. To reach this goal, distance and online education based models are considered the most efficient in expanding access to education.

Many countries in Africa are now considering this model as the feasible option to widen participation in higher education. The findings on education policies in developing countries points towards the use of technology enhanced distance education as important drivers in enabling access to higher education (Haddad & Demsky, 1995; UNESCO, 2013, 2016). High participation rates in higher education leads to sustainable economic development (Altbach et al., 2009; OECD, 2003; GEM, 2016). Hence, national education policies are developed to guide and respond to the national economic needs and social development goals of a country. Without national policies and frameworks, it is unlikely that resources will be made available to ensure the sustainability of education.

Educational institutions play a critical role in laying a foundation for economic productivity through providing training and development for high quality work-force (OECD, 2003). Most developed countries have benefited from high skilled workers. This shows that there is correlation between high-level skills and high economic development. Hence, policy makers draw from the social and economic needs to provide a set of goals, and a vision of how the education system might look like. Mannermaa, (1986) argues that a policy “that does not have any direct or indirect impact on the development of the society is totally useless” (p. 662). Current policies, and those that were developed in the 1960s after independence of many of the African countries, have alluded to the need for higher education to produce students with appropriate skills and capabilities to match national priorities (GEM, 2016). The role of policies in this regard is to respond to national economic needs and social development goals of a country (Kozma, 2005).

In this study, policies were considered for analysis because they are made up of predictive statements of desired outcomes, which provide a vision for how the education system should look like (Pavlova, 2013). The aim is to determine how the present reality and the past knowledge impact on the implementation of policies. In the absence of national open and distance learning policies in Kenya, Rwanda and Zambia, national education policies and other government documents that referred to open and distance learning and ICT in education were selected as units of analysis. Since the success of policies depends on its content and its implementation, according to Jallade, Radi and Cuenin (2001), this study will analyse the content of the policies in order to identify factors that may inhibit the successful implementation of the policies. This will be done through using futures research methods because it channels the thinking to new possibilities and gives organizations an opportunity to deal with perceived changes effectively (Malhotra, Das & Chariar, 2014). The objective of futures research “is not to know the future but to make better decisions today” for the future we hope for (Glenn, 1994, p. 4). Therefore, according to Mannermaa (1986) futures research “is not the study about the ‘future’ per se, but it is about the “present reality and the historical knowledge of the past” (p. 658). Knowledge about the future takes into account long-term trends, development, and dynamics of the social, economic and political settings of the country (Nasruddini et al., 2012; Anheier & Katz, 2009; Pavlova, 2013). This research was conducted to consider desirable features that are worth strengthening, threats that need to be eliminated and probable lines of development that are worth noting (Mannermaa, 1986).

**Futures methods analysis**

Although there are a variety of futures research methodologies that may be used, this study will use forecasting techniques because “it is concerned with approaches to determining what the future
holds” (Anheier & Katz, 2009, p. 238). This will be used to examine policy interventions on what the education landscape should look like in the future; what are the existing themes that are already forecasted into the future; and what information is needed to be gathered about the past and the current situation to make a prognosis of the future (Anheier & Katz, 2009; Dator, 2009). Forecasting assumes that the patterns that existed in the past are likely to continue into the future, hence this study will look at how past policies affected the current policy environment and how the present impacts the future (Anheier & Katz, 2009). Table 1 shows the list of policy and strategic documents that referred to open distance education and the use of technology in education. The selected documents in Table 1 are available on the public domain.

<table>
<thead>
<tr>
<th>Country</th>
<th>Policies and Strategic documents</th>
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To analyse these documents, forecasting techniques were utilized as a framework for making sense of the contents of the policies. Forecasting is based on the assumption that more timely information is necessary for policy makers to make better policy decisions (Anheier & Katz, 2009). The idea was to identify detailed overarching policy statements that made reference to open and distance learning and ICT in education. These documents were read and analysed according to the context of the country concerning the vision, the history, the present reality and the future it aspires to. Forecasting techniques seek to understand the complete social, economic, cultural, technological and political factors that may impact in the future of the country (Anheier & Katz, 2009; Dator, 2009). It looks at past patterns of the information and data and attempt to predict the future based on those patterns (Anheier & Katz, 2009; Malhotra et al., 2014). This type of analysis informs the thinking that occurs before strategic decisions are made. To identify patterns of meaning across the different documents, thematic analysis was used through a rigorous process of data familiarisation and theme development.

**Country studies**

The basis of the analysis was an extensive review of relevant documents and research papers which were accessible online. Below are concise summaries for each country presented in a narrative form.

**Kenya**

*Vision 2030: “Transform Kenya into a newly industrializing middle-income country providing a high-quality life to all its citizens in a safe and secure environment” (GoK 2007).*

*Open Praxis*, vol. 10 issue 1, January–March 2017, pp. 5–15
At the heart of this vision is the transformation of the education system that supported the agrarian industrial based economic system to a knowledge-based economic system. The idea is to shift the emphasis from knowledge reproduction to knowledge production (MoE, 2012; Nyangau, 2014). The goal is to develop a repertoire of skills and competencies necessary to achieve the objectives and goals embodied in the Constitution 2010 and Kenya Vision 2030 (GoK, 2007). In this vision, there is a clear link between education and labour market (MoE, 2012). To address this issue, the policy proposes the use of distance education and ICT to promote teaching, learning, and research in education and training (MoE, 2012). The challenge facing the Government of Kenya is to increase the number of students in higher education; to harness the skills and competencies that are presently being lost and to provide an education system, which meets the aspirations of Vision 2030 (Nyangau, 2014; Odhiambo, 2011).

Since Kenya’s independence, many policies were drawn to transform the education system to include more vocational courses with the aim of orientating youth towards self-employment (Wanjohi, 2011). However, the demand for higher education continues to grow; public funded universities are overcrowded, the curriculum remained unresponsive to present day and future needs of the labour market (Nyangau, 2014; Wanjohi, 2011). Most public higher education institutions in Kenya produce graduates who are ill equipped to compete effectively in the global economy (Odhiambo, 2011; Simiyu, 2001; Wanjohi, 2011).

Kenya is acutely aware that if they continue to use the existing traditional face-to-face education system, they may not be able to fulfill the promise of education for all (MoE, 2012). It was in search for alternative implementation strategies that Open and Distance Learning (ODL) models were explored. This form of delivery is not new in Kenya. In fact, it was used shortly after independence (Wanjohi, 2011), especially for in-service teacher education. In 2006, Kenya also adopted the ICT Strategy for Education and Training, which recognizes “ICT literate workforce as a foundation on which Kenya can acquire the status of a knowledge economy by 2030” (MoE, 2006). The analysis of these documents brought to the fore the need for mainstreaming ODL into the education sector. To achieve this, the 2005 education policy referred to the need to establish the National Open University (Nyerere, Gravenir & Mse, 2012). The policy framework further recommended the fast tracking of this process (MoE, 2012). To this day, there is still no open university in Kenya. Nyerere et al. (2012) indicate that unless there are concerted efforts and resources made available to develop the ODL sector, Kenya may not realize its Vision 2030. To reach the 2030 goal, Nyangau (2014) argues that “fundamental reforms are needed for the system to play a catalytic role in transitioning Kenya from a subsistence economy to a knowledge economy” (p. 12-13).

Rwanda

Vision 2020: To transform Rwanda’s economy into a middle-income country – (RoR, 2012).

Prior to 1994, very few students in Rwanda were able to access higher education (MINEDUC, 2010). To address this challenge, the government developed two strategic documents, the Vision 2020 and the Economic Development and Poverty Reduction Strategy aimed at creating an educated workforce with technological skills (MINECOFIN, 2013). In Vision 2020, higher education is expected to meet the needs of the nation, which suits well with the “fit for purpose” notion of quality, which in the case of Rwanda is linked with employability of graduates (Mbabazi, 2013; MINEDUC, 2010). Many graduates lack the competence and lifelong learning skills that fit the knowledge economy employers’ needs (Mbabazi, 2013).
The education system in Rwanda, as a former colony of Belgium was also affected by the colonial rule that provided formal education until its independence in 1962 (Hilker, 2011; Mbabazi, 2013). However, the continuation of imported education practices of poor teacher training, marginalization of national culture and the strict selection system acted as further barriers to education (Hilker, 2011). In the 1970s, the government instituted a policy reform to encourage young people in rural areas to access educational and employment opportunities through the introduction of vocational courses (Mbabazi, 2013). These efforts came to a naught when the school system was damaged by the civil war and the genocide that left scores of people dead, wounded both emotionally and physically and displaced (Hilker, 2011; Mbabazi, 2013). Following the cessation of the civil war, the government of Rwanda was faced with a mammoth task of rebuilding the nation and developing the much-needed skills.

In rebuilding the country, the government of Rwanda recognizes “ODL and ICT as a technology that will enable fast tracking capacity development of Rwandan citizens into skilled human capital who, in turn, can accelerate the socio-economic development of the country” (Mukama, 2016). To fast track this process, Rwanda launched an ICT for Education policy in 2016 (MINEDUC, 2016). The use of ICTs and distance education are meant to enable programs that are aimed at providing on-the-job training and in-service training to as many students as possible. Despite the need to accelerate skills development, the provision of technology-enhanced teaching and learning in Rwanda has not made a meaningful impact (Mukama, 2016). Part of the reason may be that there is no serious investment in Open Distance and eLearning (ODEL) despite the government targets of offering at least 50% of courses using ODeL by 2017 (Mukama, 2016). To effect the sustainable implementation of ODeL, Mukama (2016) suggest that there is a need to establish a national open university devoted to providing ODeL programs. Real practices that open up higher education in this setting have been lacking, and existing policies seem not to have been developed to encourage ODL practices.

Zambia


By 2030, Zambia aspires to be a nation that has an economy that is competitive, self-sustaining, dynamic and peaceful and is free from donor dependence (RoZ, 2006). In light of Zambia’s development context and vision, the expansion of higher education and Technical and Vocational Education and training (TEVET) systems is a rational policy choice both from economic and equity points of view (MESVTEE, 2014; RoZ, 2006). Zambia’s strong commitment to alleviating poverty, achieving sustained economic growth, and creating employment through educational development, is clear and its dedication to ensuring that international trends, such as the Millennium Development Goals (MDGs) and currently, the Sustainable Development Goals (SDGs), are reflected in their strategic education plans and in their policies (RoZ, 2006; UNESCO, 2016).

Since Zambia’s independence in 1964, there has been a proliferation of education policy reforms to mitigate against years of colonial neglect (Mukwena, 2001). The post-colonial government policies committed to providing free education for all up to tertiary level (UNESCO, 2016). To achieve this, early policies recognized the need to provide education to a large number of people using distance education methods (Beyani, 2013; Mukwena, 2001; Siaciwena & Lubinda, 2008). In fact, the history of distance education in Zambia dates back to the colonial era where few people who could afford studied through private correspondence colleges that had links to Britain, their colonial masters (Mukwena, 2001). To address the acute shortage of educated and trained people post-independence,
distance education was seen as a vehicle that has a potential to enable access to higher education to those students who could not study full-time (Siaciwena & Lubinda, 2008). Even when the University of Zambia was established in 1966, distance education formed part of the development of higher education in the country. It was their hope at the time that the university will reach many people with little additional resources (Beyani, 2013; Mukwena, 2001). However, this did not happen as planned. In 1996, Zambia developed another National Policy on Educating Our Future that recognized the role of distance education and the policy went as far as suggesting the establishment of a Directorate of Open and Distance Education (DODE) within the Ministry of Education (Siaciwena & Lubinda, 2008). This department was strategically positioned to promote open and distance learning practices in Zambia (Siaciwena & Lubinda, 2008). Zambia is one of the few countries in the continent that has a privately owned open university.

Despite the recognition as espoused in the Vision 2030 and the 1996 policies, Zambia has yet to reach educational standards that might be seen to lead to sustainable development (Beyani, 2013). The challenges that were identified in the current policies are similar to those that were outlined in earlier policies. The problem of low participation rates in higher education, the curriculum that is not responsive to national and global needs, increasing pressure on education infrastructure, inadequate funding and high levels of brain drain of skilled workers remains (Beyani, 2013; RoZ, 2006). Despite these limitations, the country still needs to intensify the development of human resources for the knowledge economy.

Discussion on the Findings

Probable futures

The desired outcomes in this study are clearly stipulated in the vision 2030 for Kenya and Zambia and 2020 for Rwanda. They all aspire to be “middle-income countries” that are prosperous and peaceful. The desire to develop the country by growing the economy and improving the social conditions of its citizens is often used to justify the investment in education reforms (Kozma, 2005). In the policy statements of all three countries, there is an urgent need to develop high level skills and competencies that will catapult these countries forward (Rwamatwara, 2012). Academic and skills training has great importance and relevance in developing countries of Africa where there is a huge need for skilled and trained workforce to enhance productivity and remain competitive in the global economy (OECD, 2013). To achieve this goal, there is a need to transform education systems in order to support the vision of these countries. A vision statement is meant to give a sense of what might be achievable (Freestone, 2012). Kozma (2005) found that policies that had a clear vision on “how the availability of new technologies could increase productivity, improve the quality of life and enrich culture” were more successful than those that did not have a clear goal (p.149). But this was not the case with the three countries. Their vision of what they want the education system to look like in 2030 is clear; however, they have not been successful in achieving their goals because they did not consider factors that were found to inhibit the implementation of the policy. These factors may include human and financial resources needed for the implementation, the measurable goals and the monitoring and evaluation plans (Freestone, 2012).

Inayatullah (2008) argues that “the vision must link to day to day realities; our day-to-day measures must reflect the vision” (p. 6). Many visions fail because there is no alignment between the vision, the strategy, the day-to-day life and the alternative futures (Inayatullah, 2008). Many of the developing countries tend to follow visions and development strategies of other countries. Strategies that worked in other contexts may lead to unattainable goals as is the case of “many African countries who
believed that once decolonization was complete, peace and plenty were sure to follow” (Glenn, 1994, p. 2). Haddad & Demsky (1995) argue that these policies may have failed because the “external influence can be a means in which international communities impose their fads and fashions upon less developed countries,” (p. 80). The weak policy implementation in all these countries, did not only compromise the vision of the countries, but it also affected the policy implementation at both strategic and operational level (UNESCO, 2016). Therefore, there is a need for policy makers in Africa to clearly articulate what will contribute to the successful implementation of the policy. The futures studies allow policy makers to examine social systems to derive implementation strategies (Malhotra et al., 2014).

**Current Situation**

Since the purpose of the futures research is to identify likely issues that may influence the implementation of the policy, it is important that the environment be scanned in relation to the current education landscape. The education sector in these three countries is faced with challenges of responding to the increased demand of higher education; insufficient public funding, lack of infrastructure (poorly equipped laboratories and libraries); rigid management structures and curricula that is not responsive to present day needs of the labour market (Beyani, 2013; Nyangau, 2014; Odhiambo, 2011). Most public higher education institutions from these countries produce graduates who are ill-equipped to compete effectively in the global economy because they do not have the necessary knowledge, skills and capacity to perform in the knowledge economy (Odhiambo, 2011; UNESCO, 2016). All governments agree that quality higher education is a critical driver to economic growth (Nyangau, 2014).

That is why the national education policy goals of these countries recognized open and distance education models as a feasible way of increasing the number of people studying in higher education sector. Although many countries have not used this delivery method optimally, distance education is not new in Africa. In fact, one of the oldest and the largest distance institution in the world, the University of South Africa (UNISA), has been successful in providing much needed high-level skills and knowledge to those who could not access full-time education. Following on this model, four other countries in Africa -Nigeria, Zimbabwe, Tanzania and Sudan- have established publicly funded open universities. For those countries that are lagging behind, it seems there is a general lack of understanding about the fundamental roles of open and distance education systems at political level (Beyane, 2013; Mukama, 2016; Nyangau, 2014). As a result, open and distance education systems have not been embraced as systems of education. Castaño, Redecker, Vuorikari and Punie (2013) argue that policy-makers need to develop an educational framework rooted in open education principles of flexibility, accessibility and cost effectiveness so that people have a better understanding of this education system. Furthermore, technology enhanced distance education can only be sustainable if providers take advantage of an abundance of open education resources (OER); move easily from one educational setting to another based on their interests and needs; and enable student centeredness that is a strong personalisation of the learning processes (Castaño et al., 2013). These are the critical ingredients for opening up higher education.

Although these three countries have recognised the benefits of ICT in education in enabling access to the marginalised communities, they have not been successful in implementing these systems of education. Part of the reason may be that many of the ICT for education policies and frameworks that were developed to guide the implementation focused mainly on the infrastructure and the technical aspects. In the process, they neglected the pedagogical and the educational purpose of using ICTs. This finding corroborates with Kozma’s (2005) study, which found that ICT based education policies
do not achieve what they are set out to do because they do not have a clear vision on how new technologies could increase access to higher education. Another major hindrance is that many of the African countries do not have infrastructure to support these systems (UNESCO, 2016). High costs of connectivity and lack of electricity in other parts of the continent continue to be a challenge (GEM, 2016). However, this should not stop African countries to use other technologies such as mobile phones that are readily available and accessible to the majority of people. Mobile phones have been successfully used in other sectors such as agriculture, health and banking. However, the education sector has not optimised the potential of mobile learning in delivering education to a large number of people.

**Past Policies**

Following the independence of Kenya, Rwanda and Zambia in the 1960s, these countries developed policies specifically to address the backlog of social and economic development. Hence, the first generation of post-colonial policies focused mainly on addressing the problem of an irrelevant and low-quality education system that did not address the needs of the newly independent countries (Simiyu, 2001). The vision of the policies then was to promote national unity (Kenya); provide free education to all citizens (Zambia); provide access to educational opportunities to all (Rwanda). The aim was to build economically independent countries free from the colonial ties. However, none of the early policies or strategies were able to provide a direction on what a relevant education system should entail. As a result, many of these policies were criticized for encouraging elitism and individualistic attitudes amongst learners, something that was considered incompatible to the African socialist milieu (Simiyu, 2001).

The second problem with early policies is that they prioritized Universal primary education at the expense of other education systems (OECD, 2003). Although this investment in primary education was seen as an important policy goal of increasing the number of children entering the schooling systems, it placed severe limitation on other educational systems such as secondary, vocational and higher education (Rwamatwara, 2012; UNESCO 2016). At the moment, most developing countries in Africa are faced with the challenge of providing quality education in these sectors. The 2016 UNESCO study found that the status of vocational training in the Southern African Development Community (SADC) region is inadequate. What is apparent for almost all SADC countries is that what they committed to do in their policy documents has not been translated into effective higher education systems that are relevant to the labour market (OECD, 2003; UNESCO, 2016).

The failure of the past policies may be attributed to poor accountability mechanisms, inadequate funding and weak institutional capacity to monitor and evaluate the implementation process (Mukwena, 2001; UNESCO, 2016). When the outcome is not what is expected, policy makers need to engage stakeholders such as the academics, researchers, industry, prospective employers, the government, Non-Governmental Organisations (NGOs) and students, to avoid these types of occurrences in future. It is therefore incumbent on policy makers of these countries to develop policies based on home-grown solutions. Futures research would have been useful in identifying some of the problems that impacted on the implementation of these policies. Forecasting is also useful for planning and aiding “the process of policy making for the future” (Malhotra et al., 2014, p. 126).

**Conclusion**

Drawing on the images of the future, it is important to look at the past and the present realities. The futures research methodology enabled us to see the present concerning the decision made in the past to make input and improve future planning. By so doing, we were able to consider features of
education that need strengthening and inhibiting factors that need eliminating (Mannermaa, 1986). “Any institution (country) that takes care of the present while planning for the future is more resilient to meet the needs of the society, both in present and the future” (Malhotra et al., 2014, p. 121).

These policies recognized the need for ICT in education and open and distance learning in enabling access into higher education. However, they did not adequately provide for the integration of these systems into the national education system of the countries. Unless this model of delivery is integrated into the education system, these countries may not be able to attain their goal for sustainable development and economic growth. The implementation of the national education policy in education is critical to enhancing the country’s social economic development through supporting education that is relevant to the country’s needs. To attain this, policies should consider the resources needed to support the cultural, economic and developmental aspirations of the country.

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Space as a tool for analysis: Examining digital learning spaces

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Abstract
Over the past decade we have seen a rise in the adoption and proliferation of social technologies, and along with these a move to build on the capacity to embrace new pedagogies and practices that can open our boundaries for both teaching and learning. How do we determine what we mean by space specifically in online environments and how can we examine whether our intentions for learning in them are effective? How can these spaces be enacted as learning spaces and how do we design for them? We will need to develop new methods and frameworks for analysis which takes into consideration how we conceive, perceive and enact our digital spaces and how this impacts on our practices and approaches to teaching and learning within these spaces. This paper will explore how we envision space, how a spatial perspective might be used to help assess and design these spaces, and will provide an analytical framework to examine the tensions we encounter when teaching and learning in open digital spaces.

Keywords: Learning Spaces, Spatiality, Networked Learning, Open Learning, Social Learning

Introduction
As our spaces for learning evolve and shift from the traditional brick and mortar formal classroom, to increasing inclusion of online and computer-mediated ways of communicating and connecting, we need to rethink how we think about space. Over the past decade we have seen a rise in the adoption and proliferation of social technologies, and along with these a move to build on the capacity to embrace new pedagogies and practices that can open our boundaries for both teaching and learning. There is recognition that our pedagogical approaches will need to change, in part to reflect new ideas about teaching and learning, but also to incorporate the uses of social technologies (Bayne, 2010; Conole, 2010). As we continue to adopt these new technologies, and the resulting spaces they create, we need to determine how to evaluate their effectiveness.

Anderson and Dron (2011) highlight three generations of pedagogies that they link to the development and availability of technologies that support them; cognitivism-behaviourism (pre-Internet), constructivism (advent of computer-mediated communications), and connectivism (online connections between networks). Though they highlight the need for the continued adoption of all three approaches, in the interconnected spaces of online teaching, a more networked and open approach, is often emphasized.

Networked Learning (NL) theories and approaches stem from a social-constructivist paradigm and as highlighted above, they are used to promote connections. Though one theoretical approach is not privileged over another, NL can be seen to “encompass an understanding of learning as a social, relational phenomenon, and a view of knowledge and identity as constructed through interaction and dialogue” (Ryberg, Buus & Georgsen, 2012, p. 46). Following this description we see networked learning environments created in a variety of ways, from a focus on what Ryberg et al. (2012) term “strongly tied collaborative work and dependencies” more commonly found in formal courses, to more loosely tied “social constellations” and individualized pathways characteristic of informal professional
learning networks. More recently with the rise of open, online courses (cMOOCs, Open Educational Resources Universitas (OERu) courses, and others), we see a blurring of the boundaries between formal and informal learning opportunities as educators use openness to try to overcome barriers to access and connectivity.

Though researchers have focused on the impacts of networks and specific social technologies on learning (Saadatmand & Kumpulainen, 2012) there is little on how the designed spaces created within these loosely knit learning environments are affecting learning processes and practices. How do we incorporate these networked learning principles into the design of open online learning spaces? How can these spaces be enacted as learning spaces and how do we design for them? How do we determine what we mean by space specifically in online environments and how can we examine whether our intentions for learning in them are effective? We will need to develop new methods and frameworks for analysis which takes into consideration how we conceive, perceive and enact our digital spaces and how this impacts on our practices and approaches to teaching and learning within these spaces. This paper will explore how we can envision space, how a spatial perspective might be used to help assess and design these spaces, and will provide an adapted model for creating an analytical framework to examine the tensions we encounter when teaching and learning in digital spaces.

**Considering Space and Place**

What do we mean when we talk about space in education? Typically, we think about physical spaces such as classrooms, desks, chairs, and digital spaces such as screens, websites, learning management systems (LMS), mobile phones, et cetera. As educators we often struggle within these locales, as they can often be uncomfortable, as the physical/virtual characteristics can be constraining and we have to wrangle with them as they are not designed for the practices that we want to encourage. We can all hearken to the classroom designed for lectures, which does not allow re-organization for group discussion, or the LMS discussion space, whose structure can lead to disjointed or fractured collaborative discourse.

A recent experience highlighted this dilemma. As part of a professional development day, I attended a workshop in “The Mountain Room” on workplace bullying and harassment. A beautiful room—light filled, airy, and large enough to hold over a 100 people, with one wall of glass, revealing stunning views of the surrounding mountains. The 30 or so chairs were arranged lecture style, huddled somewhat in the middle of the seemingly cavernous space, facing the front, where an elevated stage was set and the facilitator seemed trapped behind a lectern, looming down over the participants, who were distantly clustered, silent in their chairs. After ten minutes the facilitator almost stepped off the stage, narrowly missing a fall, and jokingly referred to her discomfort “up there,” and the ice was broken. The lecture-style presentation shifted to a more likely original intent—a conversation and discussion between colleagues and peers concerning difficult concepts and conflicts within the workplace. We know that space matters, and, no matter how beautifully designed, if a space is used differently from what it is intended for then a sense of discomfort can be introduced, which then has an impact on the social processes and activities that are enacted within that space.

How did the mountain room become a learning space? By learning space, what do we mean? Part of the description involved a physical location, or what could be defined as a place, a room. I have experienced that place or location at different times as a meeting space, at others a celebration space, and in sadder moments as a memorial space. It became a learning space in that moment because
of the social practices being performed, informed by a variety of cultural norms and expectations. It was the expectations and possibilities of what might happen that made it a space.

From a geographical perspective, Thrift (2003) provides a notion of space which suggests space is "not a common-sense external background to human and social action. Rather it is the outcomes of a series of highly problematic temporary settlements that divide and connect things up into different kinds of collective which are slowly provided with the means which render them durable and sustainable" (p. 95).

Here he provides a relational view of space, where it is "not a container in which the world proceeds, but it is a co-product of these proceedings" (p. 95). Critical geographers Soja (1996) and Massey (2005) provide a similar perspective of space that emphasizes a dynamic relationship between social norms, how material and social structures influence these norms and how they are then embodied by individuals (Kuntz & Berger, 2011). According to this tradition, space is "a set of relations between individuals, groups and the material environment" (Kuntz & Berger, 2011, p. 245). It is these relations and how different aspects become "durable and sustainable" in our learning environments that can be of particular interest for considering the design of online spaces.

Spatiality has also been explored from a sociological perspective, and similarly to the ideas presented above, Mol and Law (1994) describe space as being constructed through various orderings or operations of objects and social relations. Using Actor Network Theory they describe several kinds of space including regional, where objects/relations are clustered within boundaries, network where the distances between elements and relations account for difference and fluid where boundaries allow for leaking or transformation. As Law (2002) highlights, this view of space emphasizes a multiplicity, where the structure of relations, boundaries, and objects are mutable and constantly shifting.

A recent focus on space and spatiality in educational research has adopted these notions of space. In this approach, material space, such as the design and use of a classroom, is not the equivalent of place and not the object, background or container to study. Space instead is a “dynamic multiplicity that is constantly being produced by simultaneous practice-so-far” and is “enacted, turbulent, entangled and hybrid” (Fenwick, Edwards & Sawchuk, 2011, p. 129). Mol and Law’s (1994) ideas of fluid space, where boundaries between relations and objects can leak, disappear or transform without fracture, is relevant (p. 643). In this view, space could be considered mobile and permeable; open to new ideas and practices. Leander, Phillips and Taylor (2010) in describing learning spaces suggest that we need to go beyond what they term an “imagined geography” of “classroom-as-container” perspective, to one of mobility which highlights that classrooms “are not merely material spaces that are readily perceived but also conceived spaces (Lefebvre, 1991; Soja, 1989)—representations of space that powerfully shape our attempts at new visions and productions of education” (p. 333). In these views a spatial perspective can lead us to ask certain kinds of questions which may open up our thinking and lead to new approaches, both in research and educational practice. Fenwick et al. (2011) propose spatial analysis can help explore questions such as

“how spaces become specifically educational or learning spaces; how they are constituted in ways that enable or inhibit learning; create inequities or exclusions, open or limit possibilities for new practices and knowledge; and how space is represented in the artefacts we use in educational practices, such as maps and pictures” (p. 129).

They suggest that particularly in educational situations where media and communication technologies are incorporated such as in distance and open learning that the “ordering of space-time” has a critical influence on learning and working.
Digital Spaces

Many researchers claim that our conceptions of space have been under-theorized and that we often overlook it, even though we need to constantly adapt to it in response to “the constraints and affordances of the material environment, technical resources and spatial practices of others” (Jacklin, 2004, p. 387). As Mulcahy, Cleveland and Aberton (2015) argue, little empirical research describing the experiences of teachers and learners in newly designed spaces using a spatial perspective has been done, and there is little known about whether or not the “potential for reimagined pedagogies has been realised” (p. 580). Recent research has focused on traditional learning spaces with physical locations (Ellis & Goodyear, 2016), but as Bligh and Crook (2017) argue, we will need methods to examine learning environments or material spaces that are situated in places and spaces that are digital or mediated by technologies. There is a recognition that these technologies are not neutral, and are, as Dodge (2005) describes “purely relational” and “not natural, but solely the productions of their designers, and, in many cases, users” (p. 118). Kitchin and Dodge (2011) identify this type of space, which is dependent on software-driven technologies to function, as a code/space, where “software and the spatiality of everyday life become mutually constituted, that is, produced through one another” (p. 16). Building on these ideas Williamson (2012) points out computer code and algorithmic process should be seen as “productive technologies that participate actively in social activity” (para 8). He suggests that

“Increasingly, as code flows into our world through our desktop, handheld and networked devices (and particularly through inter-device interactivity and convergence), it acts as a template for contemporary life, creating “new landscapes of code” and structuring and patterning what we do and how we relate to one another” (para. 8).

Edwards (2015) suggests that this is the “hidden curriculum of software” where the knowledge infrastructures and software required to enact digital education have a built-in set of rules that govern and enact particular educational practices. As educators we need to recognize how this patterning and structuring, which effectively creates these rules, affects our spaces for learning and how we interact within them, particularly in online environments.

To explore the questions put forth by Fenwick et al. (2011) above, we will need to consider how learners and instructors use text, images, video and other representations to form their identities, social interactions, relationships and literacies in creating and inhabiting both material (offices, the train, chat rooms, discussion boards, Learning Management Systems (LMS) or Virtual Learning Environments (VLEs)) and conceptual (reflective, writing) learning spaces. As Thompson (2014) points out “web-based spaces are not containers in which online learning activities take place but rather fluid sociomaterial assemblages that take on particularities as people and things—both online and offline—negotiate how they move, mix, and mobilize in their correspondences” (p. 542). It is these negotiations and how they are impacted by the designed spaces of educational provision, and also how they then shift the spaces themselves, which needs to be considered by educators.

It was suggested earlier that technology (and hence the spaces it creates) is not culturally neutral. Goodfellow and Hewling (2005) argue that not only are virtual learning environments places where social and cultural production processes occur, they are also bound by pre-existing conventional systems that are defined by higher education cultural practices and norms. They point out that the nexus of cultural production is not solely within the discussions within the course, but is encompassed by the wide range of interactions and negotiations among the participants, which include “invisible actions mediated by background technologies (databases and servers) and implicit ones embedded in the relations with local institutional practices, and in relation to the wider discourses in online...
learning in the information age” (p. 5). Hierarchies, roles, and rules are perpetuated and replicated in our digital spaces, and as we try to incorporate more participatory and emancipatory practices we need to uncover both the visible and invisible implications that might impede our attempts.

Space and culture are intimately intertwined, and as Fenwick et al. (2011) point out, space is “inscribed with particular meanings and different values for particular purposes” (p. 151). Ryberg (2008) contends that the typical LMS/VLE often reflects “an institutional, hierarchical perspective” both in the original design (though he concedes these tools are changing and expanding) and in their enactments, and that they are limited somewhat in the pedagogical models that can be used. Bayne (2008) echoes this as she describes one particular LMS as a space of “stability, hierarchy, continuity and conservatism” (p. 9) that inhibits both teachers and learners from “enacting creatively” with both digital technologies and innovative pedagogies. In contrast, many argue that by their very nature, social technologies can be characterized as being open, participatory, collaborative, democratizing and open to user-controls (Alevizou, Galley & Conole, 2012; Ryberg, 2008). For some, they can also be described as uncomfortable spaces as Bayne (2010) asserts, “For in working online as teachers and learners, we are working in ‘destabilized’ classrooms, engaging in spaces and practices which are disquieting, disorienting, strange, anxiety-inducing, uncanny” (p. 6). Even those educators and learners with deep experience in the digital can find themselves feeling uncertain or disoriented in these spaces, particularly when the spaces are disjointed and disconnected or when new practices and responsibilities are required (Knox, 2014; Ross, Sinclair, Knox, Bayne & Macleod, 2014). Where there is discomfort, there is also at times a sense of the new and emergent, where we create spaces that allow us to question our assumptions and ways of viewing the world, what Savin-Baden (2008) calls troublesome spaces.

Design for Learning Spaces

As highlighted in the previous section we cannot assume certain spatial configurations will lead to the types of practices or support the kinds of pedagogies we use, and in fact physical/virtual spaces can often constrain our ability to introduce new practices. As Bligh and Pearshouse (2011) argue “evaluating learning spaces is a valuable activity that can generate operational insights into how physical space affects learning, and can thus feed into processes of learning space design” (p. 3). In their review of current learning space evaluation models they contend that while we recognize that material spaces impact on the learning and practices related to them, little has been done to explore the links between spaces and theory. They also emphasize that many learning theories themselves rarely emphasize space, yet they promote the need for new configurations and practices that our existing spaces are not designed to support. Current learning space evaluations ignore these links, and as Boys (2011) highlights for anyone interested in understanding what makes a good learning environment, we need “tools for understanding the everyday social and spatial practices of learning – and of how these change” (p. 64).

As hinted at in an earlier section there is a growing trend to describe our educational spaces in oppositional terms. In traditional F2F settings there has been a move to design and describe spaces in a more welcoming way, which Boys and Smith (2011) assert “typically emphasise student-centred, playful, interactive and technology-rich environments.” In the F2F realm these spaces are increasingly being designed with more informal identities, likely to include beanbag chairs, bright colours and flexible arrangements, and often termed “hubs”, learning “cafés” or “study pods.” This is contrasted with more traditional spaces which “are almost always set in opposition to a perceived norm of dull lecture halls, populated by dry pontificating professors lecturing to large groups of bored and passive students.” (p. 33). These distinctions reflect our changing approaches to education and
the values that we attach to certain theories and methodologies, and the recent focus on socio-
constructivist, learner-centered approaches.

These oppositional characterizations are also echoed in the descriptions of online environments. The “closed”, “hierarchical” and “impenetrable” spaces of the LMS or VLE, are described as “walled” “behemoths” (McRae, 2014), and governed by “gatekeeping” through layers of logins and navigation. This is contrasted with a vision of learners “adventuring” into the “wild and open” spaces of the Internet (Dron & Anderson, 2014) where social technologies are hailed as “interactive, connected, free, easily accessed and accessible, and enabled to create dynamic and nuanced communities of learners” (McRae, 2014, p. 30). But we need to be careful in these assumptions as well, as Oliver (2015) argues that if we continually idealize “technologically mediated ‘openness’” and flexible approaches to support “democratic, inclusive and radical ideals” (p. 366) we miss examining the complex and nuanced ways that these approaches also may lead to different kinds of exclusions and ‘closed-ness’. Here we are set up to describe informal/open as good, and formal/structured as bad, and Boys and Smith (2011), McRae (2014) and others suggest these binary versions of our learning spaces, perpetuated by overly simplistic spatial metaphors and often lacking supporting evidence, allow us to avoid examining the complex relationships between learning and the spaces where it takes place. As McCrae argues, we need to explore further the discourse around the “celebration and revolutionary transformation of education deployed about socially networked online environments.” Oliver (2015) also puts forward that rather than focus on the binaries of open/closed we should consider the ways in which “boundaries around education are both constructed and overcome” to explore how they are permeable (p. 373) and “what kinds of openness should be pursued” (p. 382). To consider these types of questions, a spatial lens, which allows the researcher to examine both social and material components, becomes a useful tool for examining complexity. As Fenwick and Landri (2012) point out, sociomaterial approaches can be used to “problematic learning processes entangled in widespread uses of new digital technologies” which through analysis can help make “visible the everyday, particular micro-dynamics of education and learning” (p. 4).

Building an Analytical Framework

In choosing to use social technologies, many instructors seem to be trying to move from spaces of enclosure to new spatial-temporal organizations for learning that are more open, participatory and fluid, and embody what was described earlier as troublesome space. As Goodfellow and Hewling (2005), Guimarães (2005) and others have noted, that to explore how these spaces are enacted both as spaces for learning and for cultural production, we need to examine both the visible practices of the participants as well as other invisible actions that are mediated by the physical environment and external practices. If we follow the ideas of Fenwick et al. (2011) and others that “space is not a static container” but is inscribed with particular meanings and values for different purposes, we will need to find a way to examine the space itself, as well as how participants use and inscribe different meanings within it, through their practices and their perceptions of these practices. As will be outlined in the next sections, to examine both the social and material, I suggest a two-tiered analytical framework. The first layer provides the means to examine everyday practices, including interactions between material and social spaces, through examination of the structures, communications and resulting practices over the span of a learning encounter. A spatial lens then allows exploration of how these practices signal contributors’ negotiation and sense making of the resulting learning spaces.
Everyday Practices

Kuntz and Berger (2011) propose that “space is produced, rendered meaningful by a series of repeated activities that give shape to individual and collective identities. Constructed meaning is thus a product of both social and material environments” (p. 246). In their approach to analysis, they highlight that a division between the social and material is somewhat artificial, they argue that to allow for a clear analysis, both participants’ perspectives (the social—practices, identities, interactions) and the influence on practice by the physical environment (the material—such as buildings, offices, computers, networks) needs to be examined. Carvalho and Goodyear (2014a) provide what they term an “architectural analysis” for examining learning networks, which they define as “assemblages of tools, artifacts, people, ideas and practices” (p. 14). They propose that to understand how design effects what emerges as the learning network is enacted we need to examine four elements: the set (or stage design), epistemic tasks (activities for learners), the social (emergent activity from design and tasks) and co-configuration (observed setting resulting from design). Both frameworks encourage the examination of how the material and the social interact, and provide a way examine the visible and invisible practices related to how the design of the material spaces (set design), including the tools and tasks (epistemic), are impacting the emergent learning culture (social and resulting practices). Data sources such as content analysis (of forums, posts, social media), web-sphere analysis (as per Schneider & Foot, 2005), social network analysis, surveys and interviews can all help provide a vivid description of the learning space as it evolves.

A Spatial Lens

As discussed earlier many researchers propose that in our examination of space we go beyond simplistic oppositional notions related to open/closed informal/formal to explore the relationships that happen within our designed spaces for learning. Student and instructor perceptions of their space as open/closed, formal/informal, transparent/opaque, local/global, reflective/active will influence how they both use and enact their spaces over time. Boys (2011) proposes a simplified analytical framework that links “material space and its occupation as learning” based on what she terms a simplified version of Lefebvre’s three interwoven conceptions of space. She envisions the three spaces as being interconnected, with overlapping threads that have “gaps, unintended consequences, or contradictory elements both within and between them” (p. 56).

As per Boys (2011), below is an overview of Lefebvre’s spatial triad:

- **Spatial Practices**—building on Lefebvre’s ideas of the daily routines and inter-relationships of bodies, objects, space and time, spatial practices are the ordinary routines of existing educational provisions. In accordance with Sheehy (2009), this is the first space or the perceived space where we see patterns of pedagogy and learner practices and activities enacted.
- **Representations of space**—according to Lefebvre, this space is conceptualized by the “experts”, architects/scientists/designers, and is realized through maps, plans, models and design. This space is often perceived as “legitimating existing societal ideology” and Lefebvre describes this space as the imposition of the dominant world. Boys (2011) proposes to go beyond Lefebvre’s ideas to imagine this as educational space not only being inscribed by instructors and designers, but by anyone who is trying to make sense of their world and thus uses space (conceptual, material, social or personal) as a way to attempt this (p. 55). Specifically, this is a representation of space “that attempts to design and transform the ordinary routines of learning” (p. 56).
Representational space—According to Lefebvre, we intervene and adapt existing spaces to meet our own requirements and often inscribe different meanings on both our conceptual and material spaces. Boys describes this space as the “participants’ perceptions of, relationship to and negotiations with both the “ordinary” routine of learning and specific designed transformations” (p. 56). Sheehy (2009) describes this as third space, where learners inscribe their own lived experience onto both the perceived and conceived spaces. This is the space of transformation.

Boys argues that by using this model to frame our analysis we can examine

“how and why social meaning and practices come to be articulated, how they come to be recognized more generally (and by whom); and how they become translated in specific repertoires for example through a particular design approach and vocabulary used to convert specific ideas about learning into an actual material environment” (Boys, 2011, p. 61).

Here Boys uses the term repertoire to mean the wide range of processes and behaviours we habitually use in the everyday practices of education.

Boys (2011) also proposes that there are competing attempts to define the ‘ordinary’ routines of learning, which operate at three intersecting levels:

- direct learning encounters between learners/teachers (course or program level)
- institutional (resources, supports, technologies, accreditation requirements)
- society-wide conceptions of education (discourses around openness, technologies, implications of globalization)

This adapted framework, outlined in Figure 1, can be used to examine how learners and instructors negotiate and enact their spaces (representational) by exploring the inherent gaps and contradictory tensions that arise between design space (representations of space), and the ordinary routines of learning (spatial practices). It can be used perform an analysis to explore how these three different...
ideals of space interact and to identify possible tensions, which may impact on the types of activities and practices, our repertoires, which are enacted within the learning spaces. At the course encounter it could be used to trace how a course design principle, such as the use of OER or an open platform is enacted within the space and to highlight tensions that might arise as learners and instructors negotiate the spaces, both material and social, that are created. It can also be used to highlight how institutional decisions, such as resource allocation and technology support, are influenced by societal discourses about education, and when looking at how we design for encounters using social technologies could be used to interrogate how the discourses around openness or the MOOC movement may be influential or not.

**Conclusion**

Technology is changing rapidly and shrinking our sense of space/time by increasing our ability to connect across vast distances and spaces. Globalization is opening up our boundaries and the closed classroom spaces of F2F are not necessarily the norm for many learners. As a response to increased financial pressures, higher education institutions are looking for ways to cut costs, increase profits and attract more students, and over the past five years we have seen the rise of the MOOC being portrayed as way of disrupting the status quo through increased access for a worldwide audience.

Many educators are attempting to change their own practice to help create spaces that take advantage of the opportunities afforded by these rapidly evolving technologies and resulting open learning networks. As Audrey Watters highlighted in a recent keynote, we are looking to the potential of networked learning to fulfil the promise of the Internet to “– enable a readable and a writable platform, where a multitude of voices can express themselves as creators not just consumers and not just through text but through a multitude of media – audio, video, still images, code” (Watters, 2015, para. 15). As discussed earlier, this vision of open, inclusive, discursive space is that of the boundary or troublesome space where learners can create hybrid cultures where identities, genres, public/private and informal/formal are blurred and dynamic. To fulfill these utopian visions, we will also need to go beyond the metaphor of the network to look at the material infrastructures that provide and determine access, asking how these spaces are constructed, who owns them and how they then shape our educational spaces. Edwards (2015) emphasizes that we need to consider that these technologies work through code and knowledge infrastructures which “enact opportunities in particular ways” and that we need to question not just whether education is more or less open, but “what forms of openness are worthwhile and for whom” (p. 253). The material spaces available to us as educators often do not meet our needs. The hierarchically defined spaces created through digital tools, even those created by social technologies that many consider inherently more open and participatory, are only permeable and accessible in certain ways, and to certain types of practices. These underlying structures, with their own set of rules, ownership, and hierarchical ordering impacts the resulting spaces, dictating how learners and teachers can shape and interact with them.

In this paper I argue for developing a methodological approach that will allow researchers to ask critical questions about our designed spaces. A two-tiered analytical framework which combines the examination of everyday practices (the social) and material spaces (digital places), with a spatial analysis using Boys (2011) adapted framework, can help explore the complex entanglements between the material/social. It can identify the elements of a learning network and can focus on “what brings people together in terms of knowledge and knowing, the knowledge practices they engage in and the implications of these for design” (Carvalho & Goodyear, 2014b, p. 263). Ultimately, we recognize that it is the entanglement of the material/social that leads to the success/failure of a learning space to meet its intended outcomes.
One of the challenges for learning design is how to frame design intentions and then determine whether or not these were met and what may have affected the desired outcomes. The adapted version of Boys (2011) framework for analysing space can be used to examine how learners and instructors negotiate and enact their spaces (representational) by exploring the inherent gaps and contradictory tensions that arise between design space (representations of space), and the ordinary routines of learning (spatial practices). For my own professional role as a designer/teacher, it will provide a way to help examine how design intentions shift or change traditional approaches to learning or how new practices and pedagogies I introduce or adapt may be enabled or constrained.

References


Student Perceptions of the Effectiveness of Formative Assessment in an Online Learning Environment

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Abstract

Assessment is an integral part of the teaching-learning process in both conventional and distance education contexts. Literature suggests that with the increase in the use of Information and Communications Technology in the delivery of learning, a number of institutions are resorting to formative assessment practices that are mediated by technology to not only provide flexible and more efficient means of assessment but also attain improved learning outcomes. This paper investigated student perceptions of the effectiveness of different types of formative assessment used in online learning environments. A 31-item questionnaire was used to gather data on student perceptions. On the level of difficulty, students generally perceived the various types of formative assessment as having no significant differences. Results further indicated that students received more prompt feedback from peer assessment and computer-marked assessment, compared to teacher-marked assessment. The findings of this study will support practitioners in eLearning to use formative assessment and feedback mechanisms more effectively to influence student engagement as well as learning outcomes.

Keywords: formative assessment, feedback, online learning, eLearning, student perceptions

Background

Instructors develop various teaching and learning methodologies or tools to enhance the effectiveness of online education. Examples of such methodologies are formative assessment and feedback (Hwang, Chu, Yin & Lin, 2008). Black and Wiliam (1998) define formative assessment as the process that provides both instructors and students with feedback on on-going teaching and learning with an aim to improve students' learning and attainment of the instructional objectives. Formative assessment is thus recognised as an important tool for enhancing student learning (Bell & Cowie, 2001). Formative assessment also manifests the paradigm shift in pedagogical strategies and technological use for effective delivery of instruction in distance education. The need to embed formative assessment in teaching and learning is thus viewed as a necessity in distance learning platforms (Black, Harrison, Lee, Marshall, & William, 2003; McTighe & O’Connor, 2009; Shepherd & Hannafin, 2008; Wiliam, 2011). An online learning environment embedded with formative assessment tools presents three key benefits to students (Zakrzewski & Bull, 1998). First, the timing is flexible enough to allow students to take the assessment at any time convenient to them, as long as it falls within deadline. Second, students can have several attempts at the assessment until they achieve the desired minimum grade. Third, online formative assessment provides students with prompt feedback needed to assess their learning and remedy weaknesses in instruction and their learning (Wang, Wang, Wang & Huang, 2006; Zakrzewski & Bull, 1998). Furthermore, online formative assessment can help reduce the level of anxiety among students before summative assessment (Cassady & Gridley, 2005). Due to the asynchronous nature of online learning contexts, instructors can use formative assessment to enhance interactivity between students and other students, and between students and the instructor (Vonderwell, Liang & Alderman, 2007). Achieving desirable levels of effective formative assessment
requires online instructors to rethink their online teaching strategies to support meaningful learning and assessment. In this regard, the current study set out to investigate the effectiveness of different types of formative assessment and feedback mechanisms in online learning environments.

Review of Literature

Online learning platforms present a myriad of opportunities for assessing students’ learning progress (Anderson, 2008). These opportunities involve both the teacher and students. A Learning Management System (LMS) will tend to provide tools and opportunities to exploit the expertise and influence of students in assessing the progress and work of other students in the same course. This is commonly known as peer-assessed assignments (PAAs). Computer-marked assignments (CMAs), on the other hand, make use of machine algorithms to evaluate learning outcomes as well as allow students to reflectively assess their own learning. Results obtained from one study revealed that instructors can use asynchronous online discussions to assess students’ self-regulatory activities, autonomy, communities of inquiry, and writing skills (Vonderwell et al., 2007). In another more recent study, findings suggested that online formative assessment is associated with gains in students’ achievement scores (McLaughlin & Yan, 2017). Additionally, the study indicated that formative assessment promotes the development of complex cognitive processes like self-regulation. The study concluded that formative feedback has the potential to encourage student engagement, bolster student enthusiasm to learn, and lead to improved academic achievement (McLaughlin & Yan, 2017).

This study adds knowledge to past research by focusing on student perceptions of CMAs, PAAs, and teacher-marked assignments (TMAs).

Another study investigated the association between students’ participation in unsupervised online quizzes and course outcomes in the summative examination (Kibble, 2007). Results showed that student scores in the online quizzes were significantly positively correlated with corresponding summative assessment scores. In addition, the study found that students who chose not to participate in the formative quizzes performed significantly lower on the same summative assessment compared to those students who used at least one online quiz to assess their learning progress. Students who repeatedly engaged in the reflecting, practising and revising process by participating in online formative assessment generally observed more gainful prompt feedback, and identified and corrected misconceptions that they might have held in a particular subject area (Wang, 2010).

Research also indicates that effective instructional activities allow instructors to engage students in informal instructional dialogues as a form of formative assessment conversation (Ruiz-Primo, 2011). Online learning platforms offer a variety of asynchronous and synchronous tools like discussion fora and instant messaging to facilitate such informal instructional transactions. These findings concur with those from another study which suggested that formative assessment fosters collaborative learning as well as peer-feedback in cases where students are tasked with critiquing other students’ submissions (McCarthy, 2017). The current study focused on discussion forums as one of the viable instructional dialogue platforms that instructors can use to assess student learning progress.

In an experimental study, Hwang and Chang (2011) found that formative assessment-based mobile learning approach had a significant effect on student learning interest as well as their learning achievement. Another experimental study found that students in the formative assessment test group generally learned more and showed more positive attitudes towards learning materials and future learning (Lawton et al., 2012). Therefore, using formative assessment that emphasise essential concepts can significantly impact learning outcomes in online courses (Lin & Lai, 2013; Wang et al.,
In other words, effective online formative assessment can help achieve learner-centeredness in online courses and enhance student engagement in the course to realize meaningful learning experiences (Gikandi, Morrow & Davis, 2011). In blended learning settings, formative assessment is also shown to predict student course outcome (Klinkenberg, 2017). These findings are important as they give an indication that the use of formative assessment has the potential to motivate learners’ interest in an online course as well as improve their learning outcomes.

Another study found significant differences in the way students and teachers perceived feedback practices (Havnes, Smith, Dysthe & Ludvigsen, 2012). Teachers rated the quality of feedback higher than students. Moreover, teachers also reported to have used more feedback than students did. It would seem, therefore, that what teachers considered as high-quality feedback did not necessarily translate to high-quality feedback for most students, leading to the conclusion that teachers overestimated the quality of feedback and usage of feedback by students. In addition, teachers in this study were found to lack systematic strategies required to implement feedback given to students. In this regard, the current study examined student perceptions of various assessment tools used in online education to help guide instructors’ use of systematic strategies in assessment of online courses. Understanding student perception of different forms of formative assessment used in online courses is critical in helping teachers to utilize tools that students perceive positively. This can reduce biases that students might have towards a particular form of formative assessment.

Distance learning is characteristically different from other forms of education by the fact that students and instructors are separated by distance and sometimes by time. For this reason, instructors need effective instructional strategies which involve leveraging technological innovations like Computer-Marked Assignment (CMA) to increase student interest in distance learning (Tshibalo, 2007). Formative assessment tasks linked to CMA include interactive exercises and feedback mechanisms like onscreen marking, use of databases to keep students’ progress report, and using email to send feedback to students on coursework. Another study found that technologies can be used in the classroom to impact the effectiveness and quality of teaching and learning in a way that improves metacognitive skills (Michael & Mayende, 2014). Online instructors can also use learning analytics to assess student behaviour and learning in online learning environments to improve instructional design and feedback in ways that promote meaningful learning (Martin & Ndoye, 2016). To add onto this knowledge, the current study is based on the premise that online instructors need to take advantage of technological advancements in education to make formative assessment more effective.

Whereas eLearning is steadily growing and gaining popularity in Kenya, a study revealed that universities in Kenya are faced with infrastructural and economic challenges which inhibit the successful implementation of eLearning (Nyerere, Gravenir & Mse, 2012). Another study by Njoroge and Kibaru (2012) discussed the quality of educational processes, products, and services. Kenya, as an emerging economy and at its infant stages in online learning implementation, is faced with numerous challenges related to the development, design, and implementation of quality online learning environments (Njoroge & Kibaru, 2012). This paper holds that effective use of formative assessment is one of the critical ways needed to achieve the desired status and rigour that will make online education credible and authentic. While previous studies conducted in Kenya have highlighted infrastructural challenges facing eLearning implementation in higher education in the country, this study found it necessary to explore student perception of formative assessment. That decision was informed by the need to provide insight into the instructional practices employed in eLearning in a higher education institution in the country.

Sims, Dobbs and Hand (2002) noted that the level of understanding among teachers, students, and developers of formative assessment tools impacts the overall effectiveness of the learning process.
In this study, the effectiveness of formative assessment was gauged based on: (1) how students perceived the difficulty level of various types of formative assessment, and (2) how students perceived feedback provided by the eLearning system, peers, and course lecturers. The definition of formative assessment is largely operationalized from Blair and Valdez Noel (2014) study of formative assessment in higher education. Past studies have paid a great deal of attention to the effective use of feedback for enhanced student learning. However, the current study found no single research looking at effectiveness based on the specific forms of formative assessment and feedback mechanisms used in eLearning environments. Therefore, the current study aimed to fill this gap by investigating student perceptions of the different forms of formative assessment as well as the effectiveness of feedback mechanisms used in online learning environments.

Methodology

Based on the need to examine student perceptions of the effectiveness of different formative assessment tools used in online education, descriptive design was deemed a suitable choice for the study. Descriptive research captures participants’ attitudes, behaviours, beliefs, and perceptions regarding current issues and trends (Lodico, Spaulding & Voegtle, 2010). The study was conducted in 2015 among undergraduate students enrolled in online programs offered by faculties of science and business at the eCampus, which is a virtual campus of Maseno University in Kenya. A total of 100 undergraduate students were randomly selected to participate in the study from a possible 451 undergraduate students enrolled in eLearning courses. Students were aged between 20 and 24 years. Out of a sample of 100 students, 72 students completed and submitted the online survey. This translates to 72 per cent response rate. The online questionnaire contained 31 closed-ended question items. Questionnaire items were constructed from concepts related to formative assessment and feedback mechanisms identified from existing literature. Subject experts in eLearning, distance education and measurement and evaluation helped in the determination of construct validity of the questionnaire items. A reliability of .76 was obtained for the questionnaire using the test-retest method. The questionnaire items required students to respond to statements relating to: (i) perceived level of difficulty of quiz types, (ii) perceived level of difficulty of assignment types, (iii) immediacy of feedback, and (iv) preferred feedback mechanism. The first 12 closed-ended questionnaire items relating to perceived difficulty of quiz types were based on a 5-point Likert-like scale ranging from very difficult (=1) to very easy (=5). The second 12 items testing perceived level of difficulty of assignment types were rated on a 5-point Likert-like scale ranging from very difficult (=1) to very easy (=5). The third three items on immediacy of feedback were rated on a 6-point Likert-like scale ranging from never (=1) to instantly (=6). The last four items on preferred feedback mechanisms were rated on a five-point Likert-like scale ranging from never (=1) to always (=5). Rating scales such as those used in this study help the researcher to determine the extent to which respondents agree or disagree with the survey items (Johnson & Christensen, 2008; Muijs, 2010). The quantitative data were analysed using SPSS to gain an insight into student perceptions of effective formative assessment and feedback mechanisms used in online learning environments.

Findings

Findings are presented using descriptive statistics based on mean scores (M), standard deviation (SD), frequency counts, and percentages. Students were asked to rate the following five different types of quizzes on a 5-point Likert-like scale (1=very difficult, 2=difficult, 3=somewhat difficult,
4=easy, and 5=very easy) to determine the level of difficulty students attached to each quiz type. Students rated the different quiz types as follows: multiple choice quizzes (M=3.74, SD=.949), true or false quizzes (M=3.71, SD=.941), matching quizzes (M=3.47, SD=.888), and gap filling (M=3.40, SD=.850). These findings are further summarised in Table 1. Based on these findings, most students favoured the use of multiple choices and true and false statement type of quizzes compared to teachers’ use of matching quizzes and gap filling for formative assessment.

The second set of closed-ended items revealed that students perceived assignment type as follows: posting on discussion forums (M=3.76, SD=.831), peer-assessed assignments (M=3.57, SD=.885), offline assignments (M=3.51, SD=.993), essay-type assignments (M=3.36, SD=.909), ePortfolio type assignments (M=3.31, SD=1.043), wiki-type assignments (M=3.24, SD=1.055), reflection-type assignments (M=3.19, SD=1.043), and database-type assignments (M=3.08, SD=1.004). Table 2 gives a summary of these findings. From the data, it is apparent that students positively perceived graded online discussions and peer-assessed assignments compared to other types of formative assessments.

Finally, the researchers sought to establish student perceptions of the promptness of feedback from teacher-marked assignments (TMAs), computer-marked assignments (CMAs), and peer-assessed assignments (PAAs). The items were rated on a 6-point Likert-like scale including never = 1, in a month = 2, in a week = 3, in a few days = 4, in a few hours = 5, and instantly = 6. The following were their responses: receiving feedback on CMAs (M=4.07, SD=2.009), PAAs (M=3.93, SD=1.523), and receiving feedback on TMAs (M=2.19, SD=1.206). The frequencies of these are contained in Table 3. Evidence from this section suggests that students felt that CMAs provided the most prompt feedback to completed assignments followed by peer-assessed assignments. Students indicated that they were less likely to receive feedback from TMAs.

Results further revealed that students enrolled in eLearning courses preferred to receive feedback in certain forms. Table 4 summarizes the findings. Students preferred to receive feedback from the instructor on formative assessment tasks in the form of summary of key areas to improve on (M=4.50, SD=.856), word processed documents with tracked comments from the instructor (M=4.42, SD=1.071), comments from peers (M=3.82, SD=1.155), and face to face to feedback (M=2.68, SD=1.442). The findings are discussed in depth in the subsequent subsection.

<table>
<thead>
<tr>
<th>Quiz Type</th>
<th>Descriptive</th>
<th>Very Difficult</th>
<th>Difficult</th>
<th>Somewhat Difficult</th>
<th>Easy</th>
<th>Very Easy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple-Choice</td>
<td>Frequency</td>
<td>2</td>
<td>6</td>
<td>14</td>
<td>37</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Percentage (%)</td>
<td>2.8</td>
<td>8.3</td>
<td>19.4</td>
<td>51.4</td>
<td>18.1</td>
</tr>
<tr>
<td>True/False</td>
<td>Frequency</td>
<td>3</td>
<td>4</td>
<td>15</td>
<td>39</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Percentage (%)</td>
<td>4.2</td>
<td>5.6</td>
<td>20.8</td>
<td>54.2</td>
<td>15.3</td>
</tr>
<tr>
<td>Gap Filling</td>
<td>Frequency</td>
<td>3</td>
<td>6</td>
<td>24</td>
<td>37</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Percentage (%)</td>
<td>4.2</td>
<td>8.3</td>
<td>33.3</td>
<td>51.4</td>
<td>2.8</td>
</tr>
<tr>
<td>Matching</td>
<td>Frequency</td>
<td>3</td>
<td>4</td>
<td>27</td>
<td>32</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Percentage (%)</td>
<td>4.2</td>
<td>5.6</td>
<td>37.5</td>
<td>44.4</td>
<td>8.3</td>
</tr>
</tbody>
</table>
Discussion

A summary of student responses to types of online formative quizzes in Table 1 shows that most students perceived the various types of formative assessment as easy, and also very easy to attempt. More particularly, students perceived multiple-choice quizzes and true/false assignments as easy to attempt. This can be explained by the fact that these two types of assessment offer them...
the opportunity to make a reasonable choice of the option that best answers the question items provided. Instructors can take advantage of students' positive attitude towards multiple-choice and true and false formative assessment types to repeatedly engage students and have them reflect on their learning and align their perspectives with facts covered in a course and assessed through a well-thought out comprehensive assessment that tests all the key areas covered in a course (Wang, 2010).

For assignment types, Table 2 indicates that most students rated posting on discussion forums, peer-assessed assignments, offline assignments, and essay-type assignments higher than other types of formative assignments. These findings can serve as student voices on what types of formative assessment they perceive to be effective in testing the knowledge and skills they have acquired in a particular subject area. This can help online instructors to gain insight into the types of assignments students prefer in virtual learning environments (VLEs) as well as inform pedagogical practices in such diverse learning environments. As Blair and Valdez Noel (2014) note, this is critical for sustaining effective teaching and learning processes. In addition, these findings are consistent with the findings of studies which identified the use of projects, self-assessment, weekly assignments, peer evaluations, discussion forums, and portfolios as effective online assessment techniques (Gaytan & McEwen, 2007; Gikandi et al., 2011).

Findings of this study imply that CMAs provide students with more immediate feedback than PAAs and TMAs. Most students who participated in the study reported that they received instant feedback from CMAs. This is possibly so because CMAs, especially multiple-choice tests, are designed to randomize test items and provide prompt feedback (Thelwall, 2000). According to Thelwall, this can substantially improve a student's motivation to study as well as have a positive impact on his study strategy to include increased revision. The implication, ostensibly, is immediacy of feedback to motivate students to study beyond the normal classroom hours. This is tied to research which emphasises the need to have online instructors deliver prompt feedback to students to facilitate meaningful learning.

For meaningful learning to occur, online instructors need to provide feedback packaged in a manner that makes sense and allows students to correct their misconceptions. Good practice, therefore, should help set apart high performance from low performance (Nicol & Macfarlane-Dick, 2006). Based on the findings summarised in Table 3, this study found that students perceived receiving
feedback as a summary of key areas for them to improve on as most effective. Students also rated highly the feedback received as comments made on word processed assignments. It is, however, important to note that students rated receiving feedback from their peers and through face-to-face sessions as less effective. Packaging feedback in this way provides scaffolding to students (Fluckiger, Vigil, Pasco & Danielson, 2010). This finding is also consistent with the assertion that effective feedback should aim to help students to fully understand their own learning as well as keep track of their progress and attainment of educational goals (Elwood & Klenowski, 2002; Fluckiger et al., 2010; Russell, Elton, Swinglehurst & Greenhalgh, 2006).

The findings also indicated that students perceived feedback from CMAs as more prompt compared to that from PAAs and TMAs. Online instructors should, therefore, find ways of using computer-aided marking technologies to ensure that students receive immediate feedback which provides a variety of opportunities to examine their learning progress and close gaps between their current and future academic performance (Gikandi et al., 2011). Feedback provided to students need to be self-referenced to motivate them towards making improvements. Additionally, peer assessors are likely to provide timely feedback than teachers because they are available to students and are easily perceived as non-threatening. In cases where peer assessment is well designed, it promotes reflection among students. Feedback from peer assessors is rich and open to negotiations to achieve better understanding of concepts that one might have previously misunderstood (Topping, 2010).

Conclusion

This study has yielded significant findings for instructors in tertiary and higher education institutions who would like to vary the type of formative assessment they use while leveraging on positive student perceptions of the effectiveness of the assessment tools used. The findings suggest that students perceive the use of multiple-choice quizzes, true/false quizzes, matching quizzes, gap filling quizzes, e-portfolio, peer assessment, wikis, weekly assignments, offline assignments, essay types assignments, reflection, and database type assignments as effective tools of formative assessment in online learning settings. Instructors should therefore take advantage of the affordances associated with learning management systems to enhance their teaching as well as student learning experience. This, as the findings indicate, is achievable by providing prompt and meaningful feedback to student completed tasks, encouraging students to engage with their peers in peer-assessed assignments, as well as leverage computer-assisted technologies to mark and give feedback to students in a way that ensures immediacy and subsequently enhances student learning experience.

Implications for Practice

Instructors can use online formative assessment types, especially practice tests, to ease students’ anxiety towards exams while preparing them for summative course exams. Effective use of formative assessment can thus aid undergraduate online instruction in ways that improve student confidence. Additionally, formative assignments like CMAs can be used to increase instructional time, and help students revise and challenge their misconceptions. Finally, it is imperative that instructors explore the use of CMAs and PAAs to ensure prompt and meaningful feedback, and support collaborative learning and reflection among undergraduate students enrolled in online courses. The results of this study can also be relied upon by instructional designers to design more interactive and engaging eLearning courses. However, the results of this study are limited to the extent of their generalizability to settings with more advanced educational technology tools and more innovative and integrated
transition models from traditional instructional methods to twenty-first century instructional strategies that guarantee student autonomy.

References


Implementation Factors and Faculty Perceptions of Electronic Textbooks on the iPad

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Abstract
A federally managed university in the United Arab Emirates implemented a one-to-one iPad program. In an effort to increase access to interactive digital learning resources on the iPads, they next transitioned from paper-based textbooks (pTexts) to electronic textbooks (eTexts) on the iPad for all course delivery formats. The goal of this study was to survey and report on faculty perceptions among three university divisions with the intent of highlighting factors and barriers influencing adoption of iPad-accessed eTexts in the classroom. The objective was to enhance understanding of factors that both contributed to or hindered successful implementation of eTexts. The main findings of this study were that increased training was not perceived as needed by faculty, but instead better support of technical challenges, more efficient workflows in implementation, and usability and interactive features of the eTexts were all the barriers to successful adoption of eTexts in the classroom. Suggestions for project management approaches are given, with reviews on specific factors that influenced successful adoption. The results of this study may be used to improve project management workflows and faculty support in similar implementation projects.

Keywords: electronic textbooks; ebooks; eTexts; faculty support; digital resources

Introduction
The United Arab Emirates provides three federally managed universities for national citizens that serve more than 41,000 students (Cavanaugh, Hargis, Munns & Kamali, 2012). In an effort to utilize the latest learning technologies that increase access to engaging and interactive learning opportunities, iPads were initially implemented across all these institutions in basic math and literacy programs in September 2012 (Hargis, Cavanaugh, Kamali & Soto, 2014). iPad use was expanded to other bachelor programs a year after. At one of the three federally managed universities in the United Arab Emirates, since there was a one-to-one iPad program, in an effort to increase access to interactive learning resources on the iPad, the university transitioned from paper-based textbooks (pTexts) to electronic textbooks (eTexts) to be accessed from the iPad or a browser. No printed books were bought for any courses that used iPads, excepting cases where no digital resource was available. The goal was to have only electronic textbooks and publisher digital learning resources for students, to be accessed from iPads or laptops in the classrooms in all delivery formats (face-to-face, flipped, hybrid and online).

Based on the above developments, the goal of this study was to survey and report on faculty satisfaction among three of the system’s divisions, with the intent of highlighting faculty perceptions about the use of iPad-accessed electronic textbooks in the classroom. The objective is to enhance understanding of factors that both contributed to or hindered successful use of the electronic books towards a goal of reporting on lessons learned, improved project management workflows, and adjusted faculty support plans.
Review of Literature

The traditional textbook is a paperbound learning resource. In recent decades it was often coupled with a computer disk (CD) that included teaching resources and access to PowerPoint lectures. Over the last decade, increases in access to the Internet and hand-held devices have facilitated the possibility of using digital resources for textbooks in place of traditional paper-based books and CDs. Electronic textbooks (eTexts) and online learning digital resources are increasingly replacing traditional paper textbooks (pTexts). As the use of eTexts and digital resources expands then the necessity of training, connectivity and technical support for using eTexts also increases. Over the last decade several studies have looked at the success and self-reported satisfaction with the growing use of digital learning resources.

Such as the study by Noyes & Garland (2006) that found students preferred to learn with printed vs. electronic textbooks. In another study participants felt the usability of electronic textbooks wasn’t equivalent to a paper textbook (Buzzetto-More, Sweat-guy & Elobad, 2007). In these studies, the term usability referred to ease of access to the learning content within the text, such as the ability to quickly flip to a page and read the content, or compare two pages in the book. Later, Woody, Daniel and Baker (2010) found that students preferred paper textbooks over electronic textbooks regardless of gender or computer skill levels. However, since the year 2010, studies have started to show the converse. Porter (2010) found that students preferred the electronic textbook vs. the hardcopy textbook, though both versions provided similar learning outcomes and achievement. Further, the study also reported that students preferred classroom group problem-based activities over similar activities as independent exercises in the electronic textbook. Rockinson-Szapkiw, Courduff, Carter and Bennett (2013) reported a comparative study of electronic vs. printed textbooks that found that students’ grades were comparable between pTexts vs. eTexts, but that students perceived learning increased with the eText. In another study, Daniel and Woody (2013) looked at the performance and use of eText vs. pTexts with students, and found that while achievement remained consistent between the groups, the reading time was significantly higher with eTexts than pTexts, both in the lab and at home. Stone and Baker-Eveleth (2013) also found that the perceived usefulness and satisfaction with an eText influenced intention to continue using them. In a study with similar findings, Baek and Monaghan (2013) found that students were satisfied with eTexts as long as they were high quality and easy to use. These studies show an evolution in greater acceptance of eTexts as their use becomes more common. However, dissatisfaction is still reported in recent studies. In a recent study on student satisfaction with an open eText, Illowsky, Hilton, Whiting and Ackerman (2016) found that 70% of the study participants felt the open eText used was the same quality as the pTexts. In a second related paper that reviewed studies in student satisfaction and perception of eTexts, Baglione and Sullivan (2016) found that pTexts were perceived by respondents as easier to read, understand and navigate, even though eTexts were cheaper. The students in that study also preferred the long-term access that a pText offers over eTexts. These studies highlight that over time perception and acceptance of eTexts has improved, but that still, while students and faculty value the lower cost of eTexts, the limits in usability, features, and long-term access weigh as more important than reductions in costs and prohibit eText adoption.

The above summarized research is all related to student views on use of eTexts. A search of the literature found few studies related to faculty perceptions on the adoption and use of eTexts until recent years when the interest in using Open Educational Resources (OER) and Open Textbooks (usually electronic) has expanded. Many studies found were related to use of OER to reduce the costs of education. In one study, the reductions in the cost of education
was a prime reason for open textbook adoption (Ozdemir & Hendricks, 2017). In another recent study of faculty perceptions by Jung, Bauer and Heaps (2017) on adoption of OpenStax open textbooks, the results found that 82% of faculty said they spent the same time on using the open textbook, 50% said there was no change in instructional time and investment, 68% said that students were equally prepared with either open textbook or traditional, and 64% said students had equal performance with the open textbook. In these studies, the focus is slightly different than the current study, as the main goal is educational cost reduction using open textbooks of variable quality and interactivity from a digital standpoint. There is a gap in the research on studies related to faculty perception on adoption of publisher eTexts and digital resources across multiple domains wherein cost reduction is not the primary focus but instead usability/features, access, and interactivity are instead the main focus.

In relation to the usability of technology, Davis (1989, Chuttur, 2009) proposed the Technology Acceptance Model (TAM) and found that technology use can be predicted by user motivation, which is directed by their perception of the technology usefulness. In TAM the actual use of a system is determined by its features and the user motivation (Davis, 1989; Chuttur, 2009). Studies by Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur and Sendurur (2012) reported similar findings. Ertmer et al. (2012) found a direct relationship between willingness to use technology in education and faculty beliefs or attitudes towards technology and their current skill level with technology. The perceptions of both faculty and students concerning the value of electronic books should be studied since their perceptions could directly affect their willingness to sustain eText use in education. A look at faculty perceptions on use of publisher digital resources allows administrators and project managers to obtain a clear list of factors for planning successful adoption processes and training programs related to wide-scale eText adoption.

To address this research gap area, the current study analyzed the perceptions of faculty at a federally managed university in the United Arab Emirates concerning satisfaction, usability, and reported perspectives on using publisher eTexts with students on either iPads or laptops in the classroom. This study focused on the self-reported perceptions concerning the value and usefulness of eTexts in all delivery formats (face-to-face, flipped, hybrid and online) after implementation, with the intent to better understand possible barriers to adoption and provide suggestions for adoption.

Methodology

Context

eTexts were implemented fall semester across the system of 17 campuses at a federally managed higher education institution in the United Arab Emirates. The project was implemented in just under four months. All first year courses already had a one-to-one iPad program in place (Hargis et al, 2014). eTextbooks were implemented using digital textbook platforms and publishers with iPad apps, including (though not limited to): McGraw-Hill, Pearson, Oxford University Press, Cambridge University Press, Wiley, ALEKS, VitalSource (aggregator), CourseSmart (aggregator). All the eTexts chosen required an active Internet connection to use and could not be used offline. The eTexts covered topics such as: basic science, English (ESL), and math. Training reps for VitalSource and CourseSmart were contracted to provide system-wide training sessions for faculty and staff. Educational Technology support staff at each campus were also given further training to enhance support processes. All courses had printed texts. Where possible, an eText was used in place of the printed text. The eTexts were used for courses in all delivery formats; face-to-face, flipped, hybrid, and online.
**Research Design**

The research was a non-experimental survey study designed to analyze the self-reported perceptions on eText use in the classroom by higher education faculty. Open-ended questions were included to look for patterns and relationships between the study constructs with the intent to better understand internal versus external barriers to eText use in the classroom, and to triangulate the results.

The study had the following research questions to guide the study:

1. What factors supported or inhibited use of eTexts in the classroom?
2. What approaches could be adjusted to better facilitate eText adoption in the future?

One semester after the initiation of eTexts over pTexts the eText Satisfaction Survey was distributed to 733 full- and part-time faculty of three divisions system-wide across 17 campuses, including: 1) Engineering Division, which included Aviation, 2) Foundations Division, which included basic and general studies, and 3) Computer Information Systems and Applied Communications, which included Business Studies. These divisions were selected as they housed the most courses using eTexts. The survey was anonymous and online. Data related to division was collected, but no other identifying data was collected to protect respondent identity. The survey requires consent to participate. Having an eText in a course was a pre-requisite to completing the survey. The survey asked respondent if their course had an eText, and those who selected no were disqualified from completing the survey. The survey was distributed as an email link to all faculty in these three divisions at approximately one-week intervals three separate times. After the third email reminder, the data was combined and analyzed for results. Participation was anonymous and voluntary. The survey allowed participants to select a Likert scale of Strongly Agree to Strongly Disagree, with Neutral as the middle undecided option. Each question also included the option to list Not Applicable, so that in cases that the faculty member felt a question did not apply to their situation they could list that instead of Neutral. All Not Applicable data was removed from the total n that was analyzed for each question.

**Results**

Across the three divisions a total of 733 full- and part-time faculty were invited to participate. Of those invited to participate a total of 288 accessed the survey. Of that, 18 were disqualified as they selected that they did not have an eText in their courses, and 35 were partially completed, leaving 235 fully completed surveys. That gave 81.6% (235/288) survey completion within survey attempts, and a 32% (288/733) completion rate among all invited faculty. At least one survey was received from a faculty member from each of the 17 campuses in the university system, and 13 of the campuses had 10 or more faculty submit a survey. This means the data shows a nice cross-section of viewpoints from all 17 campuses in the system. Of the 235 completed surveys submitted, 78 were from the Engineering Division, 69 were from the Foundations Division, and 88 were from the Computer Information Systems & Applied Communications Division (n=235).

Following is the analyzed data by survey question, and then an analysis centered on the research questions in the discussion section, based on the survey data as outlined in this section. In the analyzed results, where n does not equal 235, the remainder had chosen Not Applicable and were removed from the analysis. In the following analysis of data, SA= Strongly Agree, A=Agree, N=Neutral (not to be confused with the lower-case n, which is the number of respondents to that question), D=Disagree, and SD = Strongly Disagree.
The first question (Q1) was: The eText has been used as much by the students as the paper-based books were used (n=232). This question asked if the faculty perceived that the students were reading the eText as much as they had the pText. This question in conjunction with questions that follow helped to distinguish between a general lack of reading regardless of book format (digital or paper) from a lack of reading that was due specifically to the format. Of the respondents, 34% agreed (SA & A; n=80) that the eText was read as much by the students as the pText had been, while 49% disagreed (SD & D; n=114) and 16% (n=38) were neutral or had no strong opinion (Figure 1).

![Figure 1: Use of eText vs pText by students](image)

The second question (Q2) asked: My students and I were able to open and access the eText and related resources easily (n=234). This question was asked to determine if technical barriers and usability challenges were a possible barrier to the use of the eTexts. Of the respondents, 52% (SA & A) agreed that they could easily access the eText, 37% disagreed (SD & D), and 11% were neutral or had no strong opinion (Figure 2).

![Figure 2: Easy access to eText](image)

The third question (Q3) asked: I had access to my eText and Bb Learn course shell (and related resources) in a reasonable time to start planning lessons and curriculum before I needed to teach (n=232). This question was included to determine if some frustrations might stem from not having access to the digital resources early enough to prepare for lectures and lesson planning, so early access vs. usability. Some of the eTexts were accessed via laptop or iPad, but also some Blackboard courses had eText links within the course. Of the respondents, 41% agreed (SA & A) that they had timely access, 43% disagreed (SD & D), and 17% were neutral or had no strong opinion (Figure 3).

![Figure 3: Access to eText](image)
The fourth question (Q4) asked: *I was given sufficient training allowing me to access and use eTexts with confidence (n=228)*. This question was to determine if enough training was granted to faculty or if more training might be necessary. Of the respondents, 50% agreed (SA & A) that they had been given sufficient training, and 25% were Neutral, with just 25% disagreeing (SD & D) (Figure 4).

![Figure 3: Early access to eText](image)

**Figure 3: Early access to eText**

The fifth question (Q5) asked: *eTexts are easier to access and use in the classroom than paper-based books were (n=233)*. This question was to determine perspectives on the usability of the eText during classroom lessons and teaching time. Of the respondents, just 28% agreed (SA & A), while 48% (SD & D) disagreed that the eTexts were as easy to access in the classroom as pTexts books in the classroom, and 24% were neutral or undecided (Figure 5).

![Figure 4: Perception about training to use eText](image)

**Figure 4: Perception about training to use eText**

The fifth question (Q5) asked: *eTexts are easier to access and use in the classroom than paper-based books were (n=233)*. This question was to determine perspectives on the usability of the eText during classroom lessons and teaching time. Of the respondents, just 28% agreed (SA & A), while 48% (SD & D) disagreed that the eTexts were as easy to access in the classroom as pTexts books in the classroom, and 24% were neutral or undecided (Figure 5).

![Figure 5: Easy use of eText vs pText](image)

**Figure 5: Easy use of eText vs pText**
The sixth question (Q6) asked: I feel that eTexts are an improvement over paper-based books (n=234). This question was a direct question to ascertain faculty opinion of eTexts as compared to pTexts. Of the respondents, 30% agreed (SA & A), while 41% (SD & D) disagreed that they preferred the eText over the pText, and 29% were Neutral, or undecided (Figure 6).

![Figure 6: eTexts vs pTexts improvement](image)

**Question 7 (Q7): I find it difficult to use the eText for any one of the following reasons (select all that apply).** This question was included so as to offer teaching staff the opportunity to express that challenges may pose a barrier to use of eTexts with students and in the classroom. Faculty were allowed to choose multiple items. The top 4 barriers listed were 1) Too hard to take notes and keep/share them (52% of respondents chose this one), 2) that student lack of time spent on reading regardless of text format (49%), 3) too many technical difficulties (47%), and 4) access to eText too late (36%) (Table 1).

**Table 1: Reasons for difficulties in using eTexts**

<table>
<thead>
<tr>
<th>Item</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Too hard to take notes and keep/share them</td>
<td>122</td>
<td>52</td>
</tr>
<tr>
<td>Student lack of time spend reading the course text is the same regardless of whether it was paper-based or digital</td>
<td>115</td>
<td>49</td>
</tr>
<tr>
<td>Too many technical difficulties</td>
<td>110</td>
<td>47</td>
</tr>
<tr>
<td>I needed access to my book sooner than I was able to get it.</td>
<td>85</td>
<td>36</td>
</tr>
<tr>
<td>I had access to the eText but not associated support materials &amp; resources</td>
<td>78</td>
<td>33</td>
</tr>
<tr>
<td>I didn’t have my book by the first day of the term</td>
<td>75</td>
<td>32</td>
</tr>
<tr>
<td>I need more technical support to solve bugs and errors</td>
<td>69</td>
<td>29</td>
</tr>
</tbody>
</table>
In Question 7 faculty could list other challenges. The comments were analyzed for themes, and categorized into the following five main themes:

- **Interactivity:** many eTexts were nothing more than PDF files and did not have any of the interactivity that faculty would expect, and many commented that there was no reason to use them if they are not a true eText with all the interactive graphic and video capabilities that eTexts can provide.

- **Usability:** many faculty reported complaints that students preferred a traditional book that is easy to highlight, take notes from and flip to specific sections; all difficult with the eTexts. In other comments, faculty said that in science, math and engineering texts, students were supposed to write on graphs but the eText did not have that capability.

- **Supplemental Resources:** several of the study participants noted that the eTexts did not come with the same teaching resources that the traditional textbooks came with.

- **Choices:** in several cases faculty reported that since the preferred book was not yet in eText format, they were forced to choose a less optimal book for the course.

- **Technical Errors:** eTexts access required use of iPads. Together they could comprise a long list of possible technical errors and glitches that faculty had to support and deal with, and this detracted from time that should instead be spent learning the course content. In other comments, faculty noted that eTexts did not keep pace with iPad system upgrades which caused errors when students upgraded to the latest iOS version.

**Question 8 (Q8): Give any general comments you have, PRO or CON, about eText access, support, and training needs (n=96).** The comments for this question were analyzed and themes pulled to create the following list of pros and cons that faculty associated with use of eTexts in the classroom (Table 2).

<table>
<thead>
<tr>
<th>Item</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>The content isn’t the best and it would be better to choose the in-house material created by faculty and staff.</td>
<td>52</td>
<td>22</td>
</tr>
<tr>
<td>The content isn’t the best and it would be better to choose a new book for the course.</td>
<td>47</td>
<td>20</td>
</tr>
<tr>
<td>My eText isn’t optimized for use on the iPad.</td>
<td>47</td>
<td>20</td>
</tr>
<tr>
<td>I need more training on use of the eTexts and eResources</td>
<td>37</td>
<td>16</td>
</tr>
<tr>
<td>None of the above</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Other (list reason in other comment box below).</td>
<td>37</td>
<td>16</td>
</tr>
<tr>
<td>Prefer not to say</td>
<td>1</td>
<td>.04</td>
</tr>
</tbody>
</table>

\[ f = \text{frequency. } % \text{ is calculated by f/235 since respondents could choose multiple answers.} \]

In Question 7 faculty could list other challenges. The comments were analyzed for themes, and categorized into the following five main themes:

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- **Technical Errors:** eTexts access required use of iPads. Together they could comprise a long list of possible technical errors and glitches that faculty had to support and deal with, and this detracted from time that should instead be spent learning the course content. In other comments, faculty noted that eTexts did not keep pace with iPad system upgrades which caused errors when students upgraded to the latest iOS version.

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**Table 2: Pros and Cons of eTexts**

<table>
<thead>
<tr>
<th>Category</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access</td>
<td>Portable</td>
<td>Open-book exam difficult</td>
</tr>
<tr>
<td></td>
<td>Quick access to exercise answers</td>
<td>Difficult to flip or browse</td>
</tr>
</tbody>
</table>

*Open Praxis, vol. 10 issue 1, January–March 2018, pp. 41–54*
Question 9 (Q9): Which publishers and/or eText platforms are you using? (Select all that apply). The faculty were asked to list which of the publishers or publisher aggregators they were using. Results are in Table 3. The two most listed (McGraw-Hill and Pearson) with the highest numbers of participants using them were compared to Q6 in Figure 7.

Table 3: Publishers and/or eText platforms used
Which publishers and/or eText platforms are you using? (Select all that apply).

<table>
<thead>
<tr>
<th>Item</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>McGraw-Hill</td>
<td>105</td>
<td>45</td>
</tr>
<tr>
<td>Pearson</td>
<td>110</td>
<td>47</td>
</tr>
<tr>
<td>Oxford University Press</td>
<td>31</td>
<td>13</td>
</tr>
<tr>
<td>Cambridge University Press</td>
<td>20</td>
<td>9</td>
</tr>
<tr>
<td>Wiley</td>
<td>34</td>
<td>15</td>
</tr>
<tr>
<td>ALEKS</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>VitalSource</td>
<td>43</td>
<td>18</td>
</tr>
<tr>
<td>CourseSmart</td>
<td>20</td>
<td>9</td>
</tr>
<tr>
<td>Other</td>
<td>9</td>
<td>4</td>
</tr>
</tbody>
</table>

f = frequency. % is calculated by f/235 since respondents could choose multiple answers.
Discussion

Initial discussions among support staff centered on the need for more training. This study was done to verify if that was accurate or if other factors were more important barriers to eText adoption. The study had the following research questions to guide the survey construction:

1. What factors supported or inhibited use of eTexts in the classroom?
2. What approaches could be adjusted to better facilitate eText adoption in the future?

In actuality, the majority of faculty in this survey said they (75%) had sufficient training (Q4; SA, A, N), and only 25% (SD & D) felt they had not been given sufficient training already to use the eTexts with confidence. To compliment this fact, only 16% (Q7) of the faculty listed the need for more training as a barrier. Therefore, contrary to conversations based on anecdotal experiences among support staff, and regardless of the importance of training, the survey did not find increased training to be the most important factor for better adoption of eTexts, and instead other barriers seemed to pose more challenges to faculty. In answer study question 1, training did not seem to be a prohibitive factor to adoption of eTexts.

*Open Praxis,* vol. 10 issue 1, January–March 2018, pp. 41–54
In this study, 52% (Q2; SA & A) agreed that they could easily open and access the eText in class, however, 49% (Q1; SD & D) of respondents said the eText was not used as much by the students as the pText. In a subsequent question (Q7) 49% reported that student lack of time spent reading the course material was the same regardless of the format (paper or digital). This means that lack of motivation and study time may be an important internal barrier to student achievement regardless of the format of the textbook.

Lack of usability was a main barrier to use as evidenced by the open comments in Q7 and Q8. The Q7 comments were categorized into themes, including: 1) interactivity, 2) usability, 3) supplemental resources, 4) choices, and 5) technical errors. Usability and technical errors were the most highly reported challenges. In the next question, Q8, respondents were asked to list pros and cons among three themes, 1) access, 2) support, and 3) training. In answer to the first study question, the most common comment related to access and usability of the eText. Faculty felt that unusability and lack of features were a major barrier to adoption. While interactivity would be a benefit of eTexts, many faculty commented that their eText was in some cases just a “glorified PDF”, or in other cases a non-interactive digital book, and therefore did not offer up any of the digital benefits available while also having all the disadvantages of inaccessibility that digital books can pose. iPad upgrades also caused technical problems if the eTexts were not upgraded to keep pace. Several faculty also reported that the font and other visual graphics could be difficult to read. Of the respondents, 56% (Q7) claimed that it was too hard to take and share notes, and that this also limited the usability of the eTexts. In Q7 and Q8 many of the open comments said that the eText was too hard to browse and flip through and that it took too much time to try and quickly reference or look something up in them. Faculty also found that trying to refer to multiple pages at one time was too hard, where in pTexts that is easy to do. Faculty reported that a lot of class time was wasted on helping students get to the right page in the eText, or learn how to use the eText, or access the eText, where in pTexts this is quick and easy. Faculty felt there was a detraction to student learning in that valuable and limited class time was spend on access and technical errors rather than just learning the course content.

In answer to study question 1, technical issues, lack of offline access, and Internet connectivity issues were barriers to using the eText effectively with students in the classroom. Enhanced technical support was requested by several of the respondents. Finally, 36% (Q7) of respondents and 43% (Q3; SD & D) reported not having their eTexts soon enough to prepare for class, and 32% (Q7) said they did not have their eText by the first day of the term and they needed earlier access in order to prepare lectures and lessons. Respondents reported a need to access the eText and related resources earlier so as to better prepare for classes. For many the eText is accessed only through Bb Learn for which the course shells were made only a few days before the term start, so this delayed faculty preparedness. Changing learning management system procedures to open course shells (and related eText links) much earlier would alleviate this frustration.

Further comments also mentioned that eTexts did not come with any supplemental teaching resources that the respondents felt were important to class prep, and which respondents claim came with pTexts. Faculty also commented that it was hard or impossible to copy and use any of the graphics and information from the eTexts, and since they did not get any as a teaching resource to accompany the eText, and that meant they had to spend a great deal of time re-creating many of the graphics in the eText to use during lectures and classroom lessons.

Conclusions and Future Directions

As outlined in the Technology Acceptance Model (TAM), technology use can be predicted by user motivation, which is directed by their perception of the technology usefulness, wherein increased
use of a technology can be directly influenced by its features and usability, which drive user motivation to adopt it (Davis, 1985; Chuttur, 2009). In the cases where usability was a barrier, publishers could work to improve those features and this may improve satisfaction rates with digital books. In a study on e-books in education, Kissinger (2013) found that students perceived the e-book as metacognitive and individualized due to the keyword searching, book marking, and other referencing features that were reported as quick and easy. In a second similar study, Philip and Moon (2013) found that while eTexts have potential for reducing student educational costs, they needed more improvement in features and usability to make them more appealing to students. Where those usability features were improved, users report higher levels of satisfaction. In a related recent study of faculty perceptions by Jung et al. (2017) on adoption of OpenStax open textbooks, the results found that 82% of faculty said they spent the same time on studying the open textbook, and 18% said they spend more time. Of those that spent more time they claimed the following reasons as barriers: 1) eText access, 2) updated content, 3) interactivity, 4) curriculum alignment of eText, 5) content quality, 6) user convenience, and 7) customization of content. And 22% of the faculty surveyed had the following concerns: 1) lack of alignment with tests, 2) low quality of attached test banks, 3) lower student engagement, and 4) missing instructor resources. Most of these barriers inhibiting adoption of the digital open text in the study by Jung et al. (2017) correlate to the reported barriers in the current study. Interactivity, access, usability, and access to aligned teaching resources are all reported barriers to eText adoption, and per TAM, eText adoption would be facilitated if the system features and capabilities met with the users’ needs (Davis, 1985; Chuttur, 2009).

One limit of this research is that it was a volunteer-based survey. In the comment fields there were few benefits of eTexts listed, but there were many challenges, frustrations and complaints listed. Those who responded may have done so because they were feeling frustrated by the challenges the eText was providing. Those who did not respond may not have because they did not see anything to report on and were more satisfied with eTexts. Due to it being a volunteer-based census sampling method the results cannot be applied to the greater population and may be skewed toward the frustrated population of users.

Finally, in answer to study question 2, and as a consequence of the study results, the following recommendations are made for others beginning eText implementation on their campus, divided into four main categories: 1) faculty perceptions, 2) factors for successful use, 3) efficient workflow, and 4) faculty support. First, faculty perceptions will negatively or positively affect successful implementation of any project. Faculty are busy, and care about student learning as a top priority. If they perceive a value to student learning from a new innovation, then they are more likely to support project implementation successfully. If they do not see the value, or find the new tool or innovation more difficult to use than its value merits (in their view), implementation will stagnate. First and foremost is to get bottom-up faculty support as the project is then more likely to integrate more successfully. Next, 2) factors for successful use should be analyzed. In this case, the institution as a whole chose to not conduct pilots of the technology prior to full implementation. Therefore, testing of the new technology fell to all the faculty, some of which were already busy with full teaching loads. It is recommended to first have pilots in advance of full implementation. This will allow the opportunity for a select few innovative faculty to test the new technology, and make recommendations about faculty needs. Next, 3) efficient workflows are required for smooth implementation. Faculty reported in the survey comments that they got access to eTexts after the term had already started, or lost access half-way through the term, or could not access some associated learning resources, or that connectivity caused interruptions in access during class. As so many different types of eTexts, from a variety of publishers, were implemented at once, that meant that support staff and IT services were
overloaded in learning how to deal with the glitches and issues of each. This all created backlogs in support tickets and faculty needs, leading to reported frustration. Improving support workflows would smooth implementation. Finally, 4) faculty support is paramount to the success of a new technology implementation. Training was provided to the faculty and staff on how to use the eText apps on the iPad, as well as the browser platforms. In this study, 50% (Q4; SA & A) of the surveyed faculty said they agreed that they had sufficient training. However, due to delays in access to the eTexts, and reported frustration with lack of technical support with issues and glitches, it is recommended to increase the training of the support staff and faculty not on how to use the eTexts but on how to troubleshoot the technical issues that can arise.

In summary, of the faculty surveyed, only 30% (Q6; SA & A) reported that eTexts were an improvement over pTexts, and felt that usability and interactivity should be improved, technical support should be expanded, offline access added, and that there should be earlier access to the eTexts prior to a new term. Adding in these usability features would help relieve some of the barriers to use, and this result is supported by other research in the field. More technical support would have helped address the reported challenges effectively. Future directions in research could include surveying the students for their perceptions. Ultimately, they have to study and learn from the course texts, and their perceptions on what format they prefer is important.

References


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Acceptance and Usability of OER in Indian Higher Education: An Investigation Using UTAUT Model

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Abstract
In the global movement towards open knowledge society, open educational resources (OER) have become a prominent contributor as a medium of education, research and training. In India, the phenomenon of OER is still in nascent stage. Although the country has been massively investing on growth and usage of ICT, it still requires acceptance of OER as a medium of education, research or training. Particularly, adoption and usage of OER posses several challenges such as accessibility, reliability, copyright etc. There is plethora of research studies on the ICT usage in education in India, but there is hardly any empirical research evidence on OER in India. With this backdrop, at the first instance it is very much essential to investigate the acceptance and usability of OER in India. This paper focuses on faculty perception by applying Unified Theory of Acceptance and Use of Technology (UTAUT) model. Apart from this, the study also identifies the challenges associated with OER. For the purpose of this survey data is collected from 22 Indian universities located pan India. The outcome of this empirical research shall certainly useful and provide guidelines for the policy makers and users of OER in India.

Keywords: OER; Usability; Technology Acceptance; UTAUT; India

Introduction
World-wide, open educational resources (OER) have come up as a very useful medium in the fields of education, research and training. The concept of the OER came into existence in 2002 during a conference hosted by UNESCO. After which OER has travelled across the globe in different formats such as OER, Open Courseware (OCW), open textbooks, digital library, open access journal etc. With the basic motto to provide open access to knowledge, one thing that strikes about OER is that there is a lot of activity surrounding this concept. OER is considered as democratization of knowledge and education. It believes in the concept of sharing and participation.

The existing literature on the trends and usage of OER shows that OER is in the infancy stage in Indian higher education and is not utilized completely. Although there are many potential benefits of OER, at the same time challenges are also more in number. It is seen that the acceptance and usefulness of OER still posses a question. In this entire movement the faculty, educators, researchers and trainers play a pivotal role in establishing this concept. In order to get a comprehensive status about the acceptance and usability of OER in Indian higher education, this study aims to investigate about the acceptance and usability of OER in India. The study focuses on knowing the faculty perception about OER in India by using the well-accepted UTAUT model. This study aims to bridge the research gap of identifying the status of acceptance and usability of OER in India.

Status of OER in India
In the year 2008 India formally recognized the concept of usage of OER in education. Resulting which, National Knowledge Commission (NKC) went for a ‘national e-content curriculum initiative’. The aim was to create, adapt and utilize OER by Indian institutions. Past which the National Repository of OER (NROER) was launched in 2013. Some of the major OER initiatives in India are presented in Table 1.
These are some of the major breakthrough initiatives in India in the form of digital repositories, open courseware, open access journals, etc. Researchers like Bansal, Chabra and Joshi (2013); Das (2011); Sharma, Mishra and Thakur (2014), Sharma (2013) and Venkaiah (undated) have provided insights into the status, trend and challenges of OER in India. Barring these limited number of research studies which are focused on the status of OER in India, there is hardly any study conducted by any researcher to investigate acceptance and usability of OER in Indian higher education by the stakeholders (teachers, researchers, trainers, students, employers).

### Table 1: OER initiatives in India

<table>
<thead>
<tr>
<th>OER initiatives</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSIR explorations- Open Access Repository of Indian theses</td>
<td><a href="http://eprints.csirexplorations.com/">http://eprints.csirexplorations.com/</a></td>
</tr>
<tr>
<td>Digital library of India- digital collection of freely accessible rare books</td>
<td><a href="http://www.dli.ernet.in/">http://www.dli.ernet.in/</a></td>
</tr>
<tr>
<td>Indian National, Digital library in Engineering, sciences, and technology</td>
<td><a href="http://panii.iitd.ac.in/indest/">http://panii.iitd.ac.in/indest/</a></td>
</tr>
<tr>
<td>Kalasampada- Digital library: Resources of Indian cultural heritage</td>
<td><a href="http://ignca.nic.in/dgt_0001.htm">http://ignca.nic.in/dgt_0001.htm</a></td>
</tr>
<tr>
<td>Vidyarnidhi- Indian digital library of electronic theses</td>
<td><a href="http://eprints.uni-mysore.ac.in">http://eprints.uni-mysore.ac.in</a></td>
</tr>
<tr>
<td>Egyankosh- National depository of digital learning resources</td>
<td><a href="http://egyankosh.ac.in/">http://egyankosh.ac.in/</a></td>
</tr>
<tr>
<td>National Programme on technology enhanced learning (NPTEL)- E learning</td>
<td><a href="https://onlinecourses.nptel.ac.in/explorer">https://onlinecourses.nptel.ac.in/explorer</a></td>
</tr>
<tr>
<td>E-Grid- An online learning network</td>
<td><a href="http://econtent.nielit.gov.in/rs/start.php">http://econtent.nielit.gov.in/rs/start.php</a></td>
</tr>
<tr>
<td>Brihaspati- Open platform for learning</td>
<td><a href="http://digitallearning.eletsonline.com/2008/04/brihaspati-e-learning-platform/">http://digitallearning.eletsonline.com/2008/04/brihaspati-e-learning-platform/</a></td>
</tr>
<tr>
<td>ShodhGanga- Repository of PhD theses</td>
<td><a href="http://shodhganga.inflibnet.ac.in/">http://shodhganga.inflibnet.ac.in/</a></td>
</tr>
</tbody>
</table>

### Rationale

To bridge the research gaps that represent and in order to investigate the intention and perception of Indian university teachers about the acceptance and usability of OER in India, UTAUT model is used in this study. The UTAUT model (Figure 1) was formulated by Venkatesh, Morris, Davis and Davis (2003), by compiling eight acceptance models.
The UTAUT model (Figure 1) aims to explain user’s behaviour intention to use on information system. It holds four key constructs: Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions. UTAUT is an advanced individual acceptance research by unifying the theoretical perspectives common in the literature and incorporating four moderators to account for dynamic influences including gender, age voluntariness and experience (Venkatesh et al., 2003).

**Methodology**

In the present study, UTAUT model is applied to investigate the acceptance and usability of OER in India. In this moderating effect of gender, age, experience and voluntariness of use have been removed because all the sample participants belong to one particular type of higher education institution and their profession is teaching. With these alternations the research model is as presented in Figure 2.
The four constructs of UTAUT model are presented in Table 2.

Table 2: UTAUT Constructs

<table>
<thead>
<tr>
<th>Core constructs</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Expectancy</td>
<td>The degree to which an individual believes that using the system will help him or attain gains in job performance.</td>
</tr>
<tr>
<td>Effort Expectancy</td>
<td>The degree of ease associated with the use of the system.</td>
</tr>
<tr>
<td>Social Influence</td>
<td>The degree to which an individual perceives that important other believe he or she should use the new system.</td>
</tr>
<tr>
<td>Facilitating Conditions</td>
<td>The degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system.</td>
</tr>
</tbody>
</table>

Source: Venkatesh et al. (2003) and Tan (2013)

**Hypotheses**

The four constructs of UTAUT model and its impact on the Behavioural Intention (BI) of teachers to use OER have been well fitted in the research model. The relevance of these four constructs and hypotheses are presented in Table 3.

Table 3: UTAUT Constructs and Hypotheses

<table>
<thead>
<tr>
<th>Core Constructs</th>
<th>Hypotheses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Expectancy (PE)</td>
<td>H1: PE has a positive impact on BI to use OER</td>
</tr>
<tr>
<td>Effort Expectancy (EE)</td>
<td>H2: EE has a positive impact on BI to use OER</td>
</tr>
<tr>
<td>Social Influence (SI)</td>
<td>H3: SI has a positive impact on BI to use OER</td>
</tr>
<tr>
<td>Facilitating Conditions (FC)</td>
<td>H4: FC has a positive impact on BI to use OER</td>
</tr>
</tbody>
</table>

In this study each of the UTAUT constructs has four items, which are analysed (Table 4).

Table 4: The UTAUT Constructs and Items

<table>
<thead>
<tr>
<th>Construct</th>
<th>Item Code</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Expectancy (PE)</td>
<td>PE1</td>
<td>OER is useful in courses</td>
</tr>
<tr>
<td></td>
<td>PE2</td>
<td>Using OER will enable to accomplices course development activities quickly</td>
</tr>
<tr>
<td></td>
<td>PE3</td>
<td>Using OER would increase learning outcome of students</td>
</tr>
<tr>
<td></td>
<td>PE4</td>
<td>OER use will allow to have access to more information</td>
</tr>
<tr>
<td>Effort Expectancy (EE)</td>
<td>EE1</td>
<td>Interaction with OER is clear</td>
</tr>
<tr>
<td></td>
<td>EE2</td>
<td>Easy for using and integrating OER in courses</td>
</tr>
<tr>
<td></td>
<td>EE3</td>
<td>OER is easy to use</td>
</tr>
<tr>
<td></td>
<td>EE4</td>
<td>Learning to use OER is easy</td>
</tr>
</tbody>
</table>
Acceptance and Usability of OER in Indian Higher Education: An Investigation Using UTAUT Model

Instrument

The present investigation adopted the questionnaire developed by Mtebe and Raisamo (2014) to study the challenges and instructors intention to use OER in higher education in Tanzania. This questionnaire was a modified version of the questionnaire developed by Venkatesh et al. (2003). The questionnaire is a five-point Likert scale ranging from 1=strongly disagree to 5=strongly agree.

Data was collected using Google platform. The questionnaire was sent to 800 teachers of 22 universities (details about type of university provided in Table 5, A) of India. These universities are located pan India. A total of 36 were undelivered. However, 202 responses were obtained. This comes out to be 26.43% of all respondents. The respondents are teachers of different cadres such as Assistant Professor to Professor (in different disciplines). The study was carried out during April-May, 2015.

Tools

The following statistical tools were used for analysis of collected data.

- Descriptive analysis: It is used to measure frequency of data.
- Reliability analysis: It is a measure to define the degree to which measurements are free from error and therefore yield consistent results. To measure the reliability of instruments and constructs. Chronbach’s alpha (α) was used.
- Correlation analysis: It is a measure of the degree to which a change in the independent variable will result in a change in the dependent variable. Pearson correlation analysis is used in this study.
- Regression analysis: It is a technique for modeling and analysing different variable with a focus on the relationship between a dependent variable and one or more independent variables. The multivariate linear regression is used for analysis.

Analysis

The study used the Statistical Packages for Social Science (SPSS) version 20 to analyse the collected data.
Descriptive analysis

All the 202 respondents are teachers of 22 universities of India. Amongst these universities six were ODL universities, 12 were face to face and 4 were dual mode. Table 5 represents the demographic profile (A) as well as response to the basic questions on OER (B).

Table 5: Descriptive analysis

<table>
<thead>
<tr>
<th>A. Type of University</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. ODL – 6</td>
</tr>
<tr>
<td>1. IGNOU, New Delhi, India</td>
</tr>
<tr>
<td>2. BRAOU, Hyderabad, India</td>
</tr>
<tr>
<td>3. VMOU, Kota, India</td>
</tr>
<tr>
<td>4. YCMOU, Nashik, India</td>
</tr>
<tr>
<td>5. NSOU, Kolkotta, India</td>
</tr>
<tr>
<td>6. TNOU, Chennai, India</td>
</tr>
<tr>
<td>b. Face to Face – 12</td>
</tr>
<tr>
<td>1. Delhi University, Delhi, India</td>
</tr>
<tr>
<td>2. JNU, New Delhi, India</td>
</tr>
<tr>
<td>3. Ambedkar university, New Delhi, India</td>
</tr>
<tr>
<td>4. Berhampur University, Odisha, India</td>
</tr>
<tr>
<td>5. Utkal University, Bhubaneswar, India</td>
</tr>
<tr>
<td>6. Sambalpur University, Sambalpur, India</td>
</tr>
<tr>
<td>7. SNDT University, Mumbai, India</td>
</tr>
<tr>
<td>8. Xaviers University, Bhubaneswar, India</td>
</tr>
<tr>
<td>9. Mumbai University, Mumbai, India</td>
</tr>
<tr>
<td>10. Jammu University, Jammu, India</td>
</tr>
<tr>
<td>11. Andhra University, Vizag, India</td>
</tr>
<tr>
<td>12. TISS, Mumbai, India</td>
</tr>
<tr>
<td>c. Dual – 4</td>
</tr>
<tr>
<td>1. Calcutta University, Kolkotta, India</td>
</tr>
<tr>
<td>2. Jamia Millia Islamia University, New Delhi, India</td>
</tr>
<tr>
<td>3. University of Mysore, Mysore, India</td>
</tr>
<tr>
<td>4. University of Pune, Pune, India</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. Response on Basics about OER</th>
<th>Yes (percentage)</th>
<th>No (percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are you aware of the concept of OER?</td>
<td>188 (93.1%)</td>
<td>14 (6.9%)</td>
</tr>
<tr>
<td>Will you share your courses as OER?</td>
<td>174 (86.1%)</td>
<td>28 (13.9%)</td>
</tr>
<tr>
<td>Have you ever used OER?</td>
<td>40 (19.8%)</td>
<td>162 (80.2%)</td>
</tr>
</tbody>
</table>

The three basic questions on OER reveal that 93.1% of respondents are aware of the concept of OER but so far only 19.8% respondents have used OER in any form. Whereas 86.1% are willing to share their courses as OER.

Reliability analysis

The results of the Chrobach’s alpha (α) co-efficient for the 19-item instrument were 0.888. The result exceeds the recommend threshold value of 0.70.
Correlation analysis

Table 6 provides a summary of Pearson correlation analysis to test the relationships among the UTAUT constructs and BI to use OER. The convergent validity and discriminate validity are also assessed.

As per social science research guidelines Factor (items) loading results of items higher than 0.50 indicate items are loaded significantly (Hair, Anderson, Tatham & Black, 1998). In the present research model all the items are loaded significantly (p<.01) except in the case of the factor SI whose significance is at p<.05. Therefore all the items in this model have adequate reliability and convergent validity. The model also suggests that there is highly significant (at .01 level) relationship between PE, EE and FC with BI and significant (at.05 level) relationship between SI and BI.

Table 6: Pearson’s Correlations among four constructs and BI

<table>
<thead>
<tr>
<th></th>
<th>BI</th>
<th>PE</th>
<th>EE</th>
<th>SI</th>
<th>FC</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI</td>
<td>1</td>
<td>.687**</td>
<td>.698**</td>
<td>.157*</td>
<td>.460**</td>
</tr>
<tr>
<td>N</td>
<td>202</td>
<td>202</td>
<td>202</td>
<td>202</td>
<td>202</td>
</tr>
<tr>
<td>PE</td>
<td>.687**</td>
<td>1</td>
<td>.844**</td>
<td>.085</td>
<td>.532**</td>
</tr>
<tr>
<td>N</td>
<td>202</td>
<td>202</td>
<td>202</td>
<td>202</td>
<td>202</td>
</tr>
<tr>
<td>EE</td>
<td>.698**</td>
<td>.844**</td>
<td>1</td>
<td>.226**</td>
<td>.726**</td>
</tr>
<tr>
<td>N</td>
<td>202</td>
<td>202</td>
<td>202</td>
<td>202</td>
<td>202</td>
</tr>
<tr>
<td>SI</td>
<td>.157*</td>
<td>.085</td>
<td>.226**</td>
<td>1</td>
<td>.236**</td>
</tr>
<tr>
<td>N</td>
<td>202</td>
<td>202</td>
<td>202</td>
<td>202</td>
<td>202</td>
</tr>
<tr>
<td>FC</td>
<td>.460**</td>
<td>.532**</td>
<td>.726**</td>
<td>.236**</td>
<td>1</td>
</tr>
<tr>
<td>N</td>
<td>202</td>
<td>202</td>
<td>202</td>
<td>202</td>
<td>202</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)

Regression Analysis

Multivariate linear regression analysis is used to assess the effect of PE, EE, SI and FC on intention (BI) to use OER. Table 7 shows a summary of the research model.

Table 7: Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.723*</td>
<td>.523</td>
<td>.513</td>
<td>.42721</td>
</tr>
</tbody>
</table>

* Predictors: (Constant), FC, SI, PE, EE

To assess the model four constructs i.e., PE, EE, SE and FC were loaded as independent variable and BI as dependent variable and then subjected to linear regression analysis. The model explains 51.3% of the variance (adjusted R square: .513) influence on teachers’ intention to use OER. This can be considered as a good model as it is considered higher the adjusted R square value, it is considered as better model (Moksony, 1990).
Confirmation of Hypothesis

Regression analysis was used to determine the standardised and non-standardised coefficients for the constructs entered in the model. Table 8 shows the results of the regression.

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>1.233</td>
<td>.334</td>
<td>3.698</td>
</tr>
<tr>
<td></td>
<td>PE</td>
<td>.259</td>
<td>.072</td>
<td>.342</td>
</tr>
<tr>
<td></td>
<td>EE</td>
<td>.427</td>
<td>.116</td>
<td>.434</td>
</tr>
<tr>
<td></td>
<td>SI</td>
<td>.061</td>
<td>.075</td>
<td>.042</td>
</tr>
<tr>
<td></td>
<td>FC</td>
<td>-.063</td>
<td>.098</td>
<td>-.047</td>
</tr>
</tbody>
</table>

*Dependent Variable: BI

Hypothesis 1. Performance expectancy has a positive impact on the intentions to use OER.

The results indicate that performance expectancy positively impact on intentions to use OER ($\beta = .342$, $P < .001$). Therefore **H1 is supported**. It means teachers feel that by using OER their course development, teaching and outcome of learners will be better, easier and quicker. It will also help in increasing learners' outcome. At the same time, OER enables to have wider access to latest resources by using OER.

Hypothesis 2. Effort expectancy has a positive impact on the intention to use OER.

The results show that effort expectancy has positive effect on intention to use OER ($\beta = .434$, $P < .001$). Hence, **H2 is supported**. It indicates that teachers are of the opinion that OER can be learnt easily and also easy to learn. Interaction with OER is clear and easy for using and integrating in courses.

Hypothesis 3. Social influence has a positive impact on the intention to use OER.

The results clearly indicates that social influence has no effect on intention to use OER ($\beta = .042$, $P < .423$). The results show that the respondents' social circle i.e. peers, friends, staff etc. have no influence on them to use OER. Teachers feel that university may not encourage the use of OER in teaching and learning. Therefore **H3 is not supported**.

Hypothesis 4. Facilitating conditions have a positive effect on intention to use OER.

The results show that facilitating conditions do not have positive effect on intention to use OER ($\beta = -.047$, $P < .521$). Hence the **H4 is not supported**. It means teachers do not have resources and supporting conditions to use OER. Respondents feel that they do not have requisite knowledge for using and integrating OER in their courses. They are not confident about if they will get any support from university for using OER or not.

Table 9 shows the confirmation of hypotheses.
In Mtebe and Raisamo (2014) study only the H2 (i.e effort expectancy) is supported. However, in this study H1: performance expectancy and H2: effort expectancy are supported.

**Opinion about not using OER**

The last question of the questionnaire was ‘In your opinion why higher education in India do not use OER?’ The following table provides a brief about various reasons of factors for not using OER. The factors are derived from the opinion of the respondents.

The opinion revealed the key factors of not using OER. Although the teachers have fair knowledge about OER, they feel there are many challenges with regard to usage of OER use, quality, accessibility, facilitating conditions, sharing pattern, ownership, authenticity, copyright and plagiarism issues. At the same time the respondents are of the view that OER can be used in Indian higher education subject to proper policy in place and also encouragement to use OER. In table 10 the major factors are presented and the each factor is substantiated with reasons.

**Table 9: Confirmation of Hypotheses**

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Regression result</th>
<th>Confirmation</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: PE</td>
<td>Highly significant ($\beta = .342, P &lt; .001$)</td>
<td>Yes</td>
</tr>
<tr>
<td>H2: EE</td>
<td>Highly significant ($\beta = .434, P &lt; .001$)</td>
<td>Yes</td>
</tr>
<tr>
<td>H3: SI</td>
<td>Not significant ($\beta = .042, p &lt; .423$)</td>
<td>No</td>
</tr>
<tr>
<td>H4: FC</td>
<td>Not significant ($\beta = -.047, p &lt; .521$)</td>
<td>No</td>
</tr>
</tbody>
</table>

**Table 10: Not using OER: Key Factors**

<table>
<thead>
<tr>
<th>Factors</th>
<th>Major Reasons as opined by respondents</th>
</tr>
</thead>
</table>
| a. Awareness and training | • There is lack of awareness and also lack of knowledge and skill in how OER can be used-  
• Lot of respondents is of this view that they are not well trained to use OER.  
• Awareness is lacking on the learning and teaching side with regard to use of OER  
• Not techno-savvy, absence of proper guidance.  
• Perhaps because of problems related to access, attitude, linguistic barriers  
• Lack of knowledge of availability of such resources.  
• The faculty is not oriented about how to use OER in teaching.  
• Due to Non Awareness. The Culture of using need to be developed as it can disseminate education and promote collaborative learning  
• Lack of training to the teacher regarding OER technologies is the biggest hurdle  
• Ignorance about OER  
• Lack of awareness on uses rights (licensing) of OER material |
| b. Infrastructure | • There are many factors like access, speed of Internet, economical conditions of the students, reach in rural area, etc.  
• Lack of resources / technology to access Internet.  
• Insufficient access to OER for the students.  
• Faculty does not have access to OER sites (e.g, we do not have access to YouTube and FB from university). This brings in challenges in accessing  
• Shortage of multimedia based OER in Indian context,  
• Shortage of OER in vernacular languages of India |
Conclusion

The present study has tried to bridge the research gap on the usage and acceptance of OER in India. The results of the study indicate that the university teachers are very much aware of the concept of OER. But, they are not yet sure about the usage of OER in teaching and learning. Majority of them have not used OER in teaching but are willing to share their courses as OER. The investigative UTAUT research model supports two construct i.e. performance expectancy and effort expectancy and do not support two constructs i.e. facilitating condition and social influence. The correlation analysis indicate that three variables i.e. performance expectancy, effort expectancy and facilitating conditions are loaded significantly with intention to use OER and social influence is significantly loaded. The adjusted R-square value establishes the model. If we consider each construct independently and see their impact on intention to use OER then the finding are as stated below:

- Teachers feel that by using OER their course development, teaching and outcome of learners will be better, easier and quicker. It will also help in increasing learners’ outcome. At the same time, OER enables to have wider access to latest resources by using OER.
- Teachers are of the opinion that OER can be learnt easily and also easy to learn. Interaction with OER is clear and easy for using and integrating in courses.
- Teachers’ social circle i.e. peers; friends; staff etc. have no influence on them to use OER. Teachers feel that university may not encourage the use of OER in teaching and learning.
- Teachers do not have resources and supporting conditions to use OER. Respondents feel that they do not have requisite knowledge for using and integrating OER in their courses. They are not confident about if they will get any support from university for using OER or not.
Suggestions for better usage of OER

It can be inferred from the study that teachers are aware of the usage of OER. They intend to use OER because of two reasons i.e., increase in performance and easy to use. The challenges they face are lack of facilitating conditions and positive social influence on the usage of OER. It is also felt that there should be proper policy in place, the policy makers and regulating bodies should provide guidelines. Proper infrastructure and training should be provided for fully utilizing the OER. Also if there will be any encouragement or reward for using OER then teachers will feel motivated to use OER in their teaching and research activities.

Lack of unity on the usage and acceptance of OER can be dealt only if these challenges and concerns are dealt properly. To conclude, in the context of Indian higher education, OER is accepted as an idea but the implementation and usage are still far away.

Acknowledgement

The research model and questionnaire of Mtebe and Rasamo (2014) study is used with their permission.

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MOOCs for Teacher Professional Development: Reflections, and Suggested Actions

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Abstract

Teacher Professional Development (TPD) has become a major policy priority within education systems worldwide. But keeping teachers professionally up-to-date and providing them professional development opportunities on continuing basis is a big challenge. Massive Open Online Courses (MOOCs) can be a cost and resource effective means to complement the traditional methods of professional development of teachers. This optimism is based on the assumption that use of MOOCs will facilitate mass training of teachers as per their convenience and ease. The other assumption is that being MOOCs-based training, it will be easy to adapt it to different cultures and languages. Considering these assumptions, this concept paper which is based on reviews of different reports, documents and research papers - discusses the challenges of TPD, reflects upon promises of using MOOCs for TPD; details initiatives and experiences of using MOOCs for TPD; and suggests actions for promoting the use of MOOCs for TPD.

Keywords: MOOCs; Teacher Professional Development; TPD; Teachers; Teacher Training; Professional Development of Teachers

Background

The teacher is the key agent in any education system. The National Knowledge Commission of India (NKC, 2007) observed that the teacher is the single most important element of the education system. Echoing the same sentiments an OECD report observes that the quality of an education system cannot exceed the quality of its teachers since student learning is ultimately the product of what goes on in classroom (OECD, 2010). Educational researchers, policy analysts and politicians across the globe often argue and suggest that meaningful and relevant enhancement of teachers’ professional capabilities and commitment to education is essential to improve education as a whole. Emphasizing the need of meaningful and relevant professional development of teachers, a review of teacher education in Scotland suggests,

“Long-term and sustained improvement which has a real impact on the quality of children’s learning will be better achieved through determined efforts to build the capacity of teachers themselves to take responsibility for their own professional development, building their pedagogical expertise, engaging with the need for change, undertaking well-thought through development and always evaluating impact in relation to improvement in the quality of children’s learning” (Donaldson, 2011, p. 84).

Teacher Professional Development (TPD) seems a fit approach to enhance the teachers’ capabilities and commitment as it encompasses all behaviours which are intended to effect change in the skills, knowledge and experience one gain both formally and informally as one work, beyond any initial training (Allen, 2009). Teachers participate in professional development to “develop, implement, and share practices, knowledge, and values that address the needs of all students” (Schlager, Fusco, Barab, Kling & Gray, 2004), in other words, to get better at being teachers. As summary, TPD can be considered as an ongoing process of education, training, learning and support activities which is: taking place
in either external or work-based settings; engaged in by qualified, educational professionals; aimed mainly at promoting learning and development of their professional knowledge, skills and values; to help decide and implement valued changes in their teaching and learning behaviour so that they can educate their students more effectively thus achieving an agreed balance between individual, school and national needs (Earley & Bubb, 2004, p. 5).

**Practicing TPD: Expectations, and Challenges**

Highlighting about the importance of TPD, a report from OECD (2009) underlines,

“No matter how good pre-service training for teachers is, it cannot be expected to prepare teachers for all the challenges they will face throughout their careers. Education systems therefore seek to provide teachers with opportunities for in-service professional development in order to maintain a high standard of teaching and to retain a high-quality teacher workforce” (p. 49)

But promoting TPD is not an easy task even in developed countries. There are many issues and challenges to it. Odden, Archibald, Fermanich and Gallagher (2002) described in detail the various issues for professional teacher development and created a cost-framework to categorize professional development costs that consisted of six key elements: 1) teacher time, 2) training and coaching, 3) administration, 4) materials, equipment, and facilities, 5) travel and transportation, and 6) university tuition and conference fees. Normally one or other of these costs deter teachers from practicing CPD.

The other prominent challenge is that the nature of TPD has also changed, as noted by Quattlebaum (2012),

“Teacher development has moved beyond simple in-service workshops and has expanded into a more robust system of continuing education. In order to advance in their careers, teachers should seek out professional development opportunities which are ongoing and aligned with standards and assessments” (para 1).

Along with these challenges, conditions to run effective TPD programmes are many. Richardson (2003) published a list of characteristics associated with effective professional development, stating that such programs would optimally be:

“Statewide, long term with follow-up; encourage collegiality; foster agreement among participants on goals and visions; have a supportive administration; have access to adequate funds for materials, outside speakers, substitute teachers, and so on; encourage and develop agreement among participants; acknowledge participants existing beliefs and practices; and make use of outside facilitator/staff developers” (p. 402).

Summing up this issue, Gulamhussein (2013) suggests,

“Professional development can no longer just be about exposing teachers to a in a one-time workshop, or giving teachers basic knowledge about a teaching methodology. Instead, professional development in an era of accountability requires a fundamental change in a teacher's practice that leads to increase in student learning in the classroom”. Lawrie and Burns (2013) are also of the view that

“Despite a global need for quality teachers, the majority of the world's teachers receive professional development that does little to promote quality teaching. For many teachers from around the globe,
the frequency of professional development is episodic, the quality varies, its duration is limited, and support or follow-up are almost non-existent” (para 2).

They further observe, “Teacher professional development is in crisis – particularly in the world’s poorest and most fragile countries” (Lawrie & Burns, 2013, para 3). Considering all these expectations and challenges, new approaches to offer TPD become imperative.

**Advocating MOOCs for TPD: Promises, and Observations**

Basically TPD needs new approaches in terms of content delivery and mode of training and Massive Open Online Courses (MOOCs) have been seen as a potential solution. MOOCs are generally defined as open-ended education programs broadcasted through the Internet to thousands of learners. The other useful aspect is that MOOCs can accommodate a large number of teachers serving in different locations. Therefore, it can be argued that MOOCs which are open and available to anyone with an Internet connection offer numerous possibilities for improvement of training and development of teachers on continuing basis. A further discussion about MOOCs will be useful to substantiate this argument. MOOCs owe the “massive” part of their name as much to the audience they reach (up to 100,000 or more) as to the distribution of this audience covering all continents. MOOCs fall under two main categories: ‘xMOOCs’, which essentially reproduce lecture courses and end with a final examination, and ‘cMOOCs’, which champion a more collaborative approach, also known as “open learning” where participants are relatively autonomous in choosing learning materials and defining learning objectives (Richard, 2014). A Commission appointed by Norwegian Government (2013, p. 26) observes that MOOC term is used as a catch-all for courses with the following characteristics-

- Courses that are online
- Courses that are massive, i.e. scalable in relation to the number of participants
- Courses that are open, i.e. anyone can sign up for them

According to Yousef, Chatti, Schroeder, Wosnitza and Jakobs (2014),

“Massive open online courses (MOOCs) have drastically changed the way we learn as well as how we teach. The main aim of MOOCs is to provide new opportunities to a massive number of learners to attend free online courses from anywhere all over the world. MOOCs have unique features that make it an effective technology-enhanced learning (TEL) model in higher education and beyond” (p. 9).

While, Schultz (2014) argues that,

“Massive Open Online Courses (MOOCs) are digital teaching formats which offer stimuli for developing the concepts of e-learning, Web 2.0 and open educational resources. They can be used before, during and after completion of a degree course and can also be integrated at course, module or degree programme level in academic teaching” (p. 7).

These characteristics of MOOCs make them a cost effective, easily accessible and effective tool for professional development of teachers, as observed by Palmer (2015), “Teacher Professional Development is perhaps the most natural service MOOC providers could immediately provide teachers.” Detailing the reasons of using MOOCs for TPD, Marquis (2013) argues,

“Teachers are expected to nearly continuously take classes or attend trainings that will enhance their ability to do their job, yet we never acknowledge the effort or take any solid measures to support
it – little to no financial support and no releases time to do the work. But there is a real need for
teachers to keep up with the rapid pace of educational innovations and technologies for learning, as
well as changes in primary content areas. Two huge obstacles of cost and time stand like daunting
sentinels between teachers and fulfilling their ongoing professional development needs. MOOCs
could provide one possible solution to this problem” (para 4).

Similarly, Bali (2013) lists five reasons for use of MOOCs by teachers for their professional development.
According to him, use of MOOCs will help teachers to: 1) observe how others teach online, 2) join
community conversations about topics that interest them, 3) e-live the student experience – online, 4)
learn something new in a structured way, and 5) find well-chosen (mostly free) resources on a topic
or sub-topic.

Talking about the use of MOOCs for TPD, Jobe, Östlund and Svensson (2014) point-out,

“The utilization of MOOCs for professional teacher development is relatively novel and uncharted.
The combination of MOOCs and teacher development seems to offer an obvious win-win situation.
Teachers can receive high quality professional development for free, and MOOC providers can
expand their user base with motivated, educated learners” (p. 1585).

The appropriateness of MOOCs for career improvement of teachers’ is also a welcome possibility.
While they could be used to serve elements of the three categories of TPD (standardized TPD,
site-based TPD, and self-directed TPD), MOOCs best lend themselves in terms of usefulness to
facilitation of standardized TPDs and certain aspects of self-directed TPDs (Gaible & Burns; 2005;
Fyle, 2013). Furthermore, Richard (2014) argues that,

“Massive Open Online Courses (MOOC) should dramatically change professional development and
training in the coming years. Centered on building up specific skills and capacities, MOOCs represent
a breakthrough in the area of e-learning, covering numerous fields of studies from healthcare to
mathematics”.

Using MOOCs for TPD: Initiatives, and Experiences

Regarding the use of MOOCs for TPD, Dikke and Faltin (2015) observe,

“If searching for teacher professional development courses in the web, for example on the MOOC
List website10, more than 130 courses can be found. These courses are provided at MOOC and
online education platforms, such as Coursera, Canvas Network, FutureLearn, MOOC-Ed, European
Schoolnet Academy, MiriadaX, NovoEd, UPVX, edX, Open Learning, and FUN. The courses
are offered mostly in English and Spanish and cover various topics, such as teaching skills, soft
skills, language teaching, science teaching, and the use of the Information and Communication
Technology (ICT) in the classroom” (p. 3).

This is a clear indication that different countries and institutions are coming forward to use MOOCs
for TPD purposes. There is a long list of institutions (British Council and University College
London, University of California, Arizona State University, University of Groningen, University
of Pittsburgh, UNSW Australia (The University of New South Wales), Universitat Autònoma de
Barcelona, The University of Auckland, University of Houston System…) and variety of courses
(becoming a better teacher, disability support and awareness, English teaching, learning to teach
online, academic integrity, ….). There are number of providers that offer a good number of MOOCs
for professional development of teachers. Some of these providers are: Coursera, edX, Canvas
Network, Udemy, Udacity, Carnegie Mellon University - Open Learning Initiative, MOOCs from Great
Universities, EMMA - European Multiple MOOC Aggregator, FutureLearn, etc.

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Besides these initiatives, different governments are also making efforts to utilize the potential of MOOCs to achieve different educational goals. A number of Asian countries like Malaysia, Thailand, Philippines, China, South Korea and India have recognized the potential of MOOCs. There are national brands such as K-MOOCs (in Korea), Thai MOOCs or Malaysian MOOCs. MOOCs have been used to expand people’s accessibility to higher education (China), or to reform their existing systems of higher education and lifelong learning (Korea and Malaysia). While in Japan, JMOOCs project was initiated by a consortium composed of universities, corporate houses, governmental institutes and academic societies (Kim, 2015). In India, Ministry of Human Resource Development has recently embarked on a major initiative called ‘Study Webs of Active Learning for Young Aspiring Minds’ (SWAYAM), to provide an integrated platform and portal for online courses, covering all higher education, secondary education and skill sector courses. SWAYAM is an indigenous (Made in India) IT Platform for hosting the Massive Open Online Courses (MOOCs) (Kanjilal & Kaul, 2016).

In addition to governmental efforts, international organizations are also coming up with novel ways and financial support to popularize the use of MOOCs for different educational purposes including TPD. For example, UNESCO and COL have launched a MOOCs guide for policy-makers in developing countries. This guide intends to raise MOOC awareness in less well equipped developing nations, and to advise their educational policy-makers how, through online learning including MOOCs, they can build new routes to higher education and lifelong learning to benefit increasing numbers of their young and older people (Patru & Balaji, 2016). In Europe, European Union has funded a number of research and cooperation projects on MOOCs. Some of popular MOOCs project funded by European Union include HOME project (Higher Education Online: MOOCs in the European Way), ECO project (Elearning Communication and OpenData), EMMA project (European Multiple MOOC Agregator) and OpenupEd platform (the first MOOCs initiative across Europe) (Kim, 2015). All these efforts and initiatives are a clear testimony that MOOCs are in rise and can be utilized for TPD.

In other side, researchers in different parts of the world are also examining the utility of MOOCs for professional development purposes. In a study on examination of MOOC usage for professional workforce development, Garrido et al. (2016) revealed that the main motivations of MOOC users were found to be in gaining specific job skills (61%), preparing for additional education (39%), and obtaining professional certification (37%). Cole and Timmerman (2015) found that students believe MOOCs hold the potential to augment lifelong learning, even though they serve as inferior alternatives to traditional coursework. While, Koutsodimou and Jimoyiannis (2015) analyzed the responses of 326 participants and revealed that the teachers were satisfied of the course workflow, the assignments and the Web tools used, the support and peer interaction they received. The teachers considered MOOCs as a positive learning and professional development experience, which enhanced their pedagogical and technological knowledge to integrate Web-based tools in educational practice. In conclusion, the results of this study provide promising evidence that MOOCs can effectively support TPD. Another study entitled ‘Designing MOOCs for teacher professional development: Analysis of participants’ engagement’ reports high rates of course completion and teachers’ enhanced awareness and willingness to adopt MOOCs as an effective alternative for teacher professional development (Koukis & Jimoyiannis, 2017, p 279). All these studies conducted in different parts of the world with different motives reach a common conclusion-MOOCs present a number of opportunities for professional development of teachers.

Promoting MOOCs for TPD: Reflections, and Suggested Actions

MOOCs offer much varied and innovative potential in their wide geographic range and their ability to reach many and diverse participants, and in their use of collaborative formats and transparent teaching (Schultz, 2014). MOOCs have been perceived as an engaging way to expand expertise and
gain new skills for teachers. As other notable observation, a study from MIT-Harvard revealed that nearly 40 percent of learners who take open online courses are teachers. That finding has researchers wondering whether they can better design online courses once predicted to upend students’ experience to meet teachers’ needs (Carapezza, 2015). These observations clearly reveal two things, first, MOOCs offer numerous opportunities for teachers’ professional development, and second, use of MOOCs for teachers’ professional development is rising in different parts of the World. In fact, use of MOOCs for teachers’ professional development becomes more relevant in those countries having shortage of means and methods to provide CPD opportunities to the large number of teachers at different levels.

MOOCs can be a game changer in emerging countries where TPD lacks on many counts as observed by Lawrie and Burns (2013, para 3), “In the world’s poorest and most fragile countries teachers who need the highest-quality professional development and support often receive the least.” Laurillard (2016), who has conducted a study to test the efficacy of an experimental course for teachers who need but do not receive high-quality continuing professional development, claims:

“There is enough evidence from this carefully designed CPD MOOC to see that there is genuine potential for this technology to engage adults in the emerging economies in a form of professional development that would be commensurate with the immense challenge of capacity building on this scale for the teaching profession across the range of skills they need” (Laurillard, 2016, p. 15).

In addition, MOOCs have also been seen as a tool to help teachers to acquire the competences, knowledge and skills needed to participate successfully within different political, economic, social and cultural realms of society.

On the other hand, literature reviews reveal a wide range of issues and concerns related to MOOCs. These issues may be categorized under three categories (i) learner issues: learner motivations; motivation to participate; values and expectations; personal, cognitive or psychological barriers; learner dropout rates; learners’ participation and engagement patterns (ii) pedagogical issues: pedagogical design; content and resources; learning material; learning activities; learner guidance and support; tutor and facilitator roles; completion and retention (iii) technological issues: learning objects; instructional design; technologies used; assessment of learner performance; learning analytics (Bonk, Lee, Kou, Xu & Sheu, 2015; Littlejohn, Hood, Milligan & Mustain, 2016; Kumari, 2016; Eriksson, Adawi & Stohr, 2017; Koukis & Jimoyiannis, 2017). Finding appropriate solutions and answers to these challenges and concerns will certainly be helpful to maximize the use of MOOCs for TPD. In addition, need of the hour is that policy makers, researchers and educationists must come forward to find better solutions to utilize the full potential of MOOCs for different segments of teachers living and working in different economic, political, and social settings. In this backdrop, following suggested actions may be helpful to promote the use of MOOCs for TPD in different parts of the globe.

**(i) Design ‘MOOCs for TPD’ Policies**

The first step in this direction will be development of appropriate policies at governmental and institutional levels. The governmental policy regarding use of MOOCs will be a kind of generic policy mainly dealing with philosophical and theoretical aspects as well as showing the commitment of respective government of using MOOCs for TPD. For example, American government in 2014 announced that American public school teachers will have free access to 15 online Duke courses as part of a new federal program aimed at improving professional development for educators (Duke University, 2014). These governmental policies will motivate individual institutions to develop their own MOOCs for TPD polices. These policies will answer a number of questions like why teachers are required to use MOOCs, how they can use MOOCs for TPD, who will be the providers of MOOCs,
what credit they will earn by using MOOCs, who will look after their concerns and demands, etc. These MOOCs for TPD policies will serve many purposes. First of all, these policies will ensure the commitment and seriousness of the governments and educational institutions towards TPD of teachers. Second, these policies will be a guiding force for all the stakeholders to implement and organize TPD in a better and effective manner. And, the most sought effect of these policies will be on the individual teachers. These policies will help them to realize that professional development is their right and government as well institution must offer them different opportunities to fulfill their professional development needs.

(ii) Develop ‘MOOCs for TPD’ Mechanisms

The respective governments and institutions will be required to develop mechanisms to realize the potential of MOOCs for TPD. These mechanisms will provide answers to many questions like how teachers will be guided to use MOOCs, who will be the partners for MOOCs initiatives, how useful MOOCs for TPD will be identified or developed, what platform will be used to offer, what will be the terms and conditions of use of MOOCs, what will be expected type of communication, how problems of participants will be solved, how certification will take place, etc. Besides, other crucial aspects related to use of MOOCs like curriculum planning, instructional design, teaching and assessment will also be covered by these mechanisms. These mechanisms will also involve identification, promotion and evaluation of available MOOCs for TPD purposes. It can be argued that, these mechanisms will play a very important role in use of MOOCs for TPD. These mechanisms will clear the doubts and concerns of respective teachers as well motivate them to come forward to use MOOCs for their professional development. These mechanisms will also pave the way for a competition between different institutions regarding use of MOOCs for TPD. It may be hoped that educational institutions will try to innovate as well outsmart each other in this field, and teachers will be real beneficiary.

(iii) Launch ‘MOOCs for TPD’ Initiatives

Different countries and organizations have already started a number of MOOCs initiatives but there are hardly any specific MOOCs for TPD initiative. The need of the hour is that different countries and organizations must start need-based MOOCs for TPD initiatives. Launch of these initiatives will be a clear message to the teaching community that governments and institutions see MOOCs as a supporting mechanism to provide professional development opportunities to the teachers. These initiatives will focus to attract teachers from different genres to look after their professional development needs and choose appropriate MOOCs either to supplement their existing knowledge or gain new skills. These initiatives will also be helpful in increasing awareness about TPD needs and offering potential solutions via MOOCs. These initiatives will also provide an opportunity for government policy makers to foster relationships with academic institutions and private-sector partners and work together for teachers’ continuing professional development. These initiatives will also encourage different institutions to innovate and collaborate to find out better ways and techniques to use MOOCs for TPD.

(iv) Remove ‘MOOCs for TPD’ Barriers

Researches reveal that there are two main barriers related to use of MOOCs for TPD. These barriers are language barrier and cost barrier. Talking about the language barrier, Sanchez-Gordon and Luján-Mora (2014) reveal,
“The majority of MOOCs are only offered in English. A quick review of Coursera’s courses shows that 515 courses of a total of 585 courses, approximately 90%, are offered in English. Students with other native languages can have difficulties related to their proficiency in English: for example, non-native speakers read at slower speed than native speakers; the speed difference leads to information overload and cognitive issues. Due to this, the language barrier discourages many potential users of MOOCs” (p. 1455).

They also point out about cost-barrier in following words, “From the students’ point of view, MOOCs are drifting towards paid courses in the form of SPOCs. From the educational institutions’ point of view, creating a MOOC is getting more expensive because quality keeps getting higher” (Sanchez-Gordon & Luján-Mora, 2014, p. 1455). Therefore, governments and concerned organizations must come up with a plan to minimize these barriers. This can be done by encouraging more and more institutions to adapt already available MOOCs in different languages and by providing subsidies or financial support to willing institutions to develop useful MOOCs for TPD purposes.

**(v) Promote ‘MOOCs for TPD’ Cultures**

MOOCs have entered in the lexicon of education system of many countries. Different users in different countries use MOOCs for different purposes and have different gains. Banking on this trend, efforts are needed to promote the culture of using MOOCs for professional gains among teachers. The Center for Advanced Research on Language Acquisition define culture as shared patterns of behaviors and interactions, cognitive constructs and understanding that are learned by socialization (CARLA, 2014). Taking cue from this definition, one can say that “MOOCs culture” will encompass the acceptance to adaptation and use of MOOCs and keep evolving, practicing and sharing new theories and practices for professional gains at individual level and in groups. Promotion of MOOCs culture will help the teaching fraternity to learn as well share initiatives, experiments and achievements of using MOOCs. The teachers’ own stories, experiences and anecdotes related to MOOCs usage for professional development will be a part of this culture. Spread of this culture will be a motivation for teachers to come together and start using MOOCs for their professional gains.

**(vi) Research ‘MOOCs for TPD’ Practices**

As discussed earlier, there is a strong need to start need-based MOOCs for TPD initiatives. But only starting these initiatives will not be sufficient. The other equally important aspect is to learn that whether these initiatives are getting the desired results. Here research about ‘MOOCs for TPD’ practices becomes critical. These researches will be beneficial on many counts. First, these researches will tell that how MOOCs initiatives are working, what are their strengths and at what count they need improvement. Second, these researches will also guide policy planners and providers that how to strengthen or improve the existing initiatives. These researches will also reveal that why a particular initiative is successful and why other initiative is lacking. This information will certainly be helpful to improve the success rate of existing as well as proposed initiatives. In other words, these researches will be helpful to plan need based and locally suitable initiatives of using MOOCs for TPD. Besides, this research support will be helpful to understand the viewpoints and concerns of teachers regarding use of MOOCs for TPD and the inputs will certainly be helpful to guide this movement further.

**Conclusion**

The advocacy to use MOOCs for TPD purposes is based on many promises. First, “MOOCs have the instructional design and technology necessary to offer a high-quality education-and they’re
clearly attracting smart people who want to advance their professional development” (Coffman, 2015). Second, MOOCs offer a powerful platform for education and development with cost savings and greater efficiency (Florentine, 2015). Third, MOOCs promise to support teacher professional development by providing accessible, flexible and fast-track completion of certified courses (Kumari, 2016). Fourth, participating in MOOCs can help to develop certain teaching, digital, and academic skills (Urrutia, Fielding & White, 2016). Fifth, MOOCs can train a large number of untrained or less trained teachers to become more professional in their practices and approaches (Laurillard & Kennedy, 2017). And most importantly, sixth, MOOCs provide a professional development with alternative credentials recognized by employers (Amigot, 2017). Instead of these proclaimed benefits, teachers still feel reluctant or sometimes ignorant to use MOOCs for professional development purposes. Therefore, it becomes obvious that teaching community as well policy makers must be made aware about novel policies and practices to promote the use of MOOCs for TPD. The suggested ‘MOOCs for TPD’ actions are an attempt in this direction. It can be hoped that different countries, institutions and organizations will take note of and implement the suggested actions to ensure the systematic and effective use of MOOCs to support teachers’ to remain professionally competent and educationally relevant on continuing basis.

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Online educators’ recommendations for teaching online: Crowdsourcing in action

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Abstract

Over the years, online educators have learned a great deal about what works and doesn’t work when designing and facilitating online courses. During the past few years, we have used crowdsourcing to invite experienced online educators to share their recommendations for teaching online. In this article, we describe our use of crowdsourcing to curate a robust list of online-teaching recommendations, present the recommendations experienced online educators have shared with us, share the themes resulting from our analysis, describe how the themes align with the Community of Inquiry (CoI) model, and discuss how adhering to the crowdsourced recommendations may enhance the design and facilitation of online courses.

Keywords: Online teaching; online education; crowdsourcing; instructional strategies; Community of Inquiry (CoI); presence

Overview

In their seminal Seven Principles for Good Practice in Undergraduate Education, Chickering and Gamson (1987) wrote about the following seven principles:

- Encourages contacts between students and faculty.
- Develops reciprocity and cooperation among students.
- Uses active learning techniques.
- Gives prompt feedback
- Emphasizes time on task
- Communicates high expectations.
- Respects diverse talents and ways of learning.

It is likely the best-known set of engagement factors (Kuh, 2009), having been cited almost 7,000 times. The seven principles identified success factors that influence students’ engagement, success, and persistence during their undergraduate-education experience. The principles have been used in multiple ways over the years, including as a lens for integrating technology into the classroom (Chickering & Ehrmann, 1996) and evaluating online courses (Graham, Cagiltay, Lim, Craner & Duffy, 2001). They also served to inform the design of the National Survey for Student Engagement (NSSE) (Kuh, 2009). But what is not talked about much is how the principles were created (Chickering & Gamson, 1999). The principles were not solely derived from a systematic review of the literature.
At a conference, Chickering and Gamson invited a group of experienced postsecondary educators to share what they knew about good practice for undergraduate education—although not a term used at the time, Chickering and Gamson essentially used a crowdsourcing approach to help them co-construct the seven principles of good practice in undergraduate education.

Crowdsourcing—a conjunction of “crowd” and “outsourcing” coined by Jeff Howe in a June 2006 Wired magazine article—is “the process by which the power of many can be leveraged to accomplish feats that were once the province of a specialized few” (Howe, 2008). Howe (2010) further defined crowdsourcing as “the act of taking a job traditionally performed by a designated agent (usually an employee) and outsourcing it to an undefined, generally large group of people in the form of an open call.” Also referred to as citizen science and citizen social science (e.g., Procter et al., 2013; also see https://scistarter.com/), this participatory process has recently gained in popularity due to the increasing volume of scientific data and limited centralized support to efficiently process the data (Ranard et al., 2014). Although extensively used in the biomedical domain as a way to harness the computational power of many people to process large-scale biomedical data—such as to support genome sequence analysis (Kawrykow, Roumanis, Kam & Kwak, 2012; Rallapalli et al., 2015) and protein structure prediction (Cooper et al., 2010)—it is also now being used as a field-based research methodology in a wide range of disciplines; for example crowdsourcing approaches are used to classify distant galaxies (Lintott et al., 2008; also see https://www.galaxyzoo.org/), create geographic digital maps (Whitmeyer & De Paor, 2014), collect more representative data in forensic psychology research (Baker, Fox & Wingrove, 2016), tackle complex architectural design needs (Newton & Backhouse, 2013), validate assessment of interventions for speech disorders (Byun, Halpin & Széredi, 2015), and engage in new product development (Schemmann, Herrmann, Chappin & Heimeriks, 2016). The growing need for crowdsourcing in research and development has led to social networked spaces such as the Amazon Mechanical Turk (https://www.mturk.com/), CloudFactory (https://www.cloudfactory.com/), CrowdFlower (https://www.crowdflower.com/), and clickworker (https://www.clickworker.com/)—online, distributed sources of available workers. Social network platforms have increasing potential to change the way people connect and engage online; people no longer solely consume online content, but are now empowered to actively participate and contribute. With the advent of online social networked spaces and platforms, crowdsourced content and opportunities for contribution are ubiquitous via YouTube, Twitter, Quora, Pinterest, TripAdvisor, Wikipedia, Kickstarter, and so on.

There are four types of crowdsourcing: collective intelligence, crowd creation, crowd voting, and crowd funding (Howe, 2008). All four types of crowdsourcing go far beyond divide-and-conquer approaches to goal achievement and research; they are true collaborations between and among members of the crowd—leading to much more than individual, isolated contributions. Crowdsourcing has fundamentally changed and enhanced the collection and dissemination of data, content, resources, problem solving, and computing power, and has been proven effective for rapid and efficient data collection, especially where expert-level knowledge of a topic or discipline is not a necessity (Whitmeyer & De Paor, 2014). [To view a wide range of crowdsourcing projects, see https://en.wikipedia.org/wiki/List_of_crowdsourcing_projects].

The Catalyst for Our Curiosity

Online courses are part of the postsecondary teaching and learning landscape. Online education has grown from a fringe activity to something that millions of people take part in (Allen, Seaman, Poulin, & Straut, 2016; Ginder & Stearns, 2014). Despite the popularity of online education, online educators are in many ways still trying to figure out the best ways to design and facilitate online learning experiences (Everson, 2009; Motte, 2013; Tallent-Runnels et al., 2006; Ubell, 2017). Fortunately instructional design
models have emerged to help designers and educators consider critical instructional decisions inherent in designing and teaching online courses. One model in particular has gained a lot of traction, and has significantly influenced our work in online education—the Community of Inquiry (CoI) model. Garrison, Anderson and Archer (2000) developed the Community of Inquiry (CoI) model to describe how the interplay between teaching presence, social presence, and cognitive presence are foundational to the development of deep and meaningful educational experiences in online courses (see Figure 1). The CoI model emphasizes balanced instructional attention to teaching, social, and cognitive presence in order to cultivate an engaged online learning community (Lowenthal & Dunlap, 2014):

- Social presence involves the connections students and faculty establish in a learning space; social presence is influenced by the quality and quantity of interactions between and among students and faculty, helping all involved to feel more involved and engaged in an online space. The goal of social presence is to minimize transactional distance and help students and faculty feel real in online courses in service to achieving the learning objectives (Lowenthal & Dunlap, 2014).
- Cognitive presence refers to how students interact with and process the content of a learning experience. Supported by teaching and social presence, students’ cognitive presence is engaged through deep and relevant cognitive-processing activities and assessments that lead to enhanced conceptual understanding (Dunlap, Sobel & Sands, 2007).
- Teaching presence refers to the decisions educators make regarding the design, direction, and facilitation of social and cognitive-processing interactions in online courses (Anderson, Rourke, Garrison & Archer, 2001). To establish teaching presence, faculty attend to the design and organization of learning experiences, the design and facilitation of interactions, and the assessment of student learning.

Because the CoI model is a descriptive model that does not provide much prescriptive guidance on how to intentionally design for and facilitate student learning and engagement in online courses (Garrison & Arbaugh, 2007), online educators continue to experiment with different ways of
establishing a Community of Inquiry in their online courses (Dunlap & Lowenthal, 2014; Lowenthal & Dunlap, 2014). Online educators can make some inferences from the indicators of teaching presence developed by Anderson et al. (2001), but even these indicators lack sufficient detail (Dunlap, Verma & Johnson, 2016). There is also literature suggesting strategies for establishing social presence (Dunlap & Lowenthal, 2014; Lowenthal & Dunlap, 2014) and cognitive presence (Dunlap, Furtak & Tucker, 2009; Dunlap, Sobel & Sands, 2007; Sobel, Sands & Dunlap, 2009) in online courses, however these strategies represent recommendations from a few as opposed to the many. Therefore, in much the same way Chickering and Gamson used a crowdsourcing approach to illuminate success factors for undergraduate education, we broadened the online-teaching conversation by crowdsourcing specific recommendations online educators have for teaching online. Through this process we curated prescriptive strategies for actualizing the CoI model in the design and teaching of online courses.

**Approach to Inquiry**

We were interested in co-constructing a list of recommendations for online educators, using a crowdsourcing approach similar to the one used by Chickering and Gamson’s to derive the seven principles for good practice in undergraduate education. Because crowdsourcing is a participative activity in which “an individual, an institution, a non-profit organization, or company proposes to a group of individuals of varying knowledge, heterogeneity, and number, via a flexible open call, the voluntary undertaking of a task” (Estellés & González, 2012, p. 197), we invited online educators from a variety of disciplines and with a range of experiences to share recommendations for online teaching, knowing that experienced online educators—regardless of discipline and experience level—would be able to contribute relevant recommendations. We defined “experienced online educators” as educators who had taught at least one online course in the last three years, whether or not they designed the course themselves or inherited from another educator. Similarly, we invited contributions from educators representing a variety of disciplines. Although there are situational factors—such as discipline differences, course size, length of course, preparation and disposition of students and faculty—that make every online course unique (Dunlap, Furtak & Tucker, 2009; Dunlap, Verma & Johnson, 2016; Sobel, Sands & Dunlap, 2009), we believed many recommendations for online teaching would transcend situational factors in the same way Chickering and Gamson’s seven principles transcend situational factors. Our inquiry was shaped by the belief that there is value in exploring the day-to-day practice of online educators who have amassed recommendations for teaching online.

The recommendations were crowdsourced from online educators who attended our presentation sessions for special interest groups focused on online education at seven professional education conferences over a two-year period:

- Association for Educational Communications and Technology (AECT), international conference
- ED-MEDIA, international conference
- American Educational Research Association (AERA), national conference
- Educational Learning Initiative (ELI), national conference
- CITE/Pearson, national conference
- Colorado Learning and Teaching with Technology (COLTT), regional conference
- CU Online Symposium, regional conference

During each of our presentations audiences collaborated on a shared Google Doc, with each participant anonymously contributing one to two recommendations about teaching online. We displayed the list of recommendations on a screen as the audience added them. As part of the sessions, we then opened up the conversation so the audience could discuss similarities, surprises,
and future actions. In this way we used crowdsourcing to create an increasingly robust list of recommendations from online educators in the trenches; crowdsourcing audiences at professional conferences allowed us to tap into the collective intelligence of educators with online teaching experience.

**Results**

Individually, we examined the curated recommendations for common themes. Although our own work as online educators is significantly influenced by the Community of Inquiry (CoI) model, we intentional set aside the model as we analyzed and sorted the recommendations; we wanted any themes to organically emerge from the data. After we each sorted recommendations into general categories (e.g., learning, teaching, design, support), we worked together to define and describe specific themes. Through our collaborative analysis we found that the recommendations consistently fell into four themes: (a) supporting student success, (b) providing clarity and relevance through content structure and presentation, (c) establishing presence to encourage a supportive learning community, and (d) being better prepared and more agile as an educator. Below is a sampling of recommendations to illustrate each theme.

**Supporting Student Success**

Experienced online educators shared strategies for supporting students in online courses so that students have the potential to be successful. For example, some of the recommendations referred to the need to:

- Provide relevant individual and group feedback in a timely manner. Feedback is essential, and be specific in your feedback.
- Grade frequently. Every week or more often. If you don’t grade, they don’t do.
- Make sure feedback is clear, explicit and includes opportunities to ask questions for clarity.
- Champion the student voice.
- Design learning experiences that address all learning preferences/styles.
- Remember that an online course needs to be an interactive experience.
- Let students have fun. Let them create and post materials, search out and post resources, do video responses, use apps like screencasting, Pinterest, etc.
- Students want choice; give them a choice of which activity to select.
- Create opportunities for students to solve their own problems.
- Incorporate choices for student assignments and assessments.
- It is more important what the students do then what you do.
- Remember that it’s about the student and not the teacher.
- Involve those students who are afraid to participate. Give students specific roles, use discussion protocols that help make space for all students to contribute.
- Use collaborative, group projects to have students work on topics of their own choosing that still meet the learning objectives of the course.
- Students are so tired of respond/post 3 times, so get them working together to create something. Such as using Google Docs to collaborate on a list like this one.
- Provide opportunities for higher order learning, experiential learning to engage students.
- Have effective assessment tools/rubrics so students know how they are being assessed.
- Model what you want from students (e.g., model how to share and interact in a discussion forum, provide exemplars of projects and other assignments, and engage in think-alouds that illustrate how to read and take notes from primary sources).
• Model the kind of writing, critical analysis, digital literacy, and digital composition activities you want students to engage in.
• Model the behaviors you expect from students.
• Account for cultural differences. For example, not all people/cultures feel comfortable doing an ice-breaker that gets too personal.
• Be concrete and explicit with instructions for all activities, assignments, and projects. You get what you ask for.
• Make students accountable for their learning. Contracts are great. So are rubrics as long as your students are interpreting them the same way you are--provide examples.
• Map out all course requirements in advance so you and your students can plan out the workload at the start of the semester.
• Make sure your students can’t get lost - make sure they know your expectations, what they should be doing, when it needs to be done, and your expectations for the course.
• Set the same expectations for your students that you set for yourself.
• Provide a just-in-time tech support option for students, where they can ask “how do I?” questions, and the instructor provides visual examples (e.g., screen capture) to provide answers.
• Have a format for discussion that rotates roles on a weekly or biweekly basis.
• Be interesting—use different ways to keep the course spontaneous.
• Don’t assume all the students are tech savvy, nor that they have the same level of technology.
• Clarify how course content applies to the profession and world beyond the academy.
• For large online courses (100+) record an introductory podcast.
• Know your institution’s FERPA and ADA considerations, and student learning services.

Providing Clarity and Relevance through Course Structure and Content Presentation

Experienced online educators also shared lessons learned regarding the structure of online courses and the presentation of content within an online course. Some of the recommendations they shared include:

• Present content in digestible chunks to make it easier for students to process.
• Structure online learning resources so materials are one click away.
• Don’t underestimate the power of integrating relevant visual components in course materials.
• Make sure content is accessible.
• Address universal design for learning (UDL) principles in all created materials.
• Be intentional with every aspect your course design.
• Make everything explicit; say more than you think you need to say.
• Use guest lectures where appropriate in order to expose students to a range of expertise, multiple perspectives, and practitioners/scholars in the field.
• Assign meaningful work: do not ask students to participate in an online discussion, for example, unless the discussion clearly supports students’ learning and progression.
• Use technology intentionally, not just because it is novel and “cool”.
• If sharing recorded lectures, create “chapters”/mini-lectures that are in more manageable, accessible chunks.

Establishing Presence to Encourage a Supportive Learning Community

Interestingly, the highest number of recommendations shared by experienced online educators fell into the “presence” theme. Online educators commented on the importance of connecting with students, helping students connect with each other, and helping students feel they are members of a supportive learning community. Recommendations include:

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• Know your audience.
• Create a sense of community.
• Make many human connections, early in the course, to ensure all students feel comfortable communicating with you and each other.
• Put faces with names.
• Get to know people on a personal level in the online world (make connections).
• Use students’ names.
• Be accessible.
• Be kind.
• Show your character. Personality is a good thing.
• Online students typically won’t take advantage of having your personal cellphone number. Really!
• Use stories to liberate and articulate your experience in ways that have potential value to students; ask students to share stories as well.
• Have a sense of humor, and share it if and when appropriate.
• When building the course, think like a film director: everything in the frame is there for a reason. Control the environment—keep it focused. When running the course, think like a good hostess—keep everyone involved, keep things moving, but don’t be the focus of attention.
• Use scaffolded, structured group work to build relationship through relevant collaboration.
• Instead of asynchronous discussions in a forum, use synchronous (online) sessions.
• Incorporate the use of synchronous communication and collaboration technologies in order to connect with students in real-time; use video and audio functionality so students can see and hear you and each other.
• Use video to introduce yourself to the class as the instructor. Ask students to do the same.
• Create social presence using audio and video (e.g., weekly audio/video introductions).
• Step outside of the LMS to connect with students more informally. Use social networking to stay in causal contact with students, and for students to be connected with each other.
• Make collaboration tools and technologies available for students to work together.
• Create opportunities for students to build community.
• Connect visually with your students, using video, Skype, etc. Do this immediately at the beginning of the term as it actually changes the quality of your interactions from and with students from that point on.
• Instead of a text-based announcement, use a video walk-through. It can do wonders for immediate relationship building (personalizing the instructor).
• Allow yourself to use the telephone (or web conferencing space such as Skype or Zoom) to connect with students, especially if you want to be more efficient in responses to misunderstandings or the need for further clarity.
• Construct online discussion questions to encourage conversation and sharing.
• You can (probably) never do too much to get students to engage. Silence is most likely a bad sign.

Being Better Prepared and More Agile as an Educator

Experienced online educators also pointed to being better prepared and more agility as useful lessons they had learned, sharing recommendations such as:
• Sometimes you have to leave the LMS and find other technologies that help you better achieve your instructional goals.
• Online teaching isn’t about taking your face-to-face course materials and uploading them to a course!
• It is okay if things don’t go perfectly the first time— they probably won’t. You’ll learn and keep improving along the way.
• Assume nothing.
• Nothing beats preparation.
• Be well prepared. Quality comes from advanced thoughtfulness.
• Technology fails. Have a backup plan.
• Have a Plan B--a REALLY GOOD Plan B.
• Have plans A, B, C... for all modalities.
• Expect that technology will fail -- have a Plan B and a Plan C. Consider this part of course preparation.
• Don’t over plan to the point you can’t or are unwilling to adjust if need be.
• Be flexible.
• Be prepared up front to be flexible.
• Expect the unexpected, no matter how prepared you think you are.
• Don’t be afraid to drop things when you go online - you only have so much time.
• Don’t underestimate the time commitment to teach online. Make room in your schedule to work on your online course and with your students.
• Technologies are always changing. Be open to trying new things.
• Take advantage of faculty development workshops and conferences on online teaching.
• Use midterm and end-of-semester feedback from students to make necessary modifications.
• Ask colleagues to check out your course and make recommendations for revision.
• Remember that good teaching is good teaching. You may need to translate for the online environment, but what you know about student learning is still relevant.

Discussion

The four themes that emerged from our analysis of the recommendations resonated well with the Community of Inquiry (CoI) model:

• The “Supporting student success,” “Providing clarity and relevance through course structure and content presentation,” and “Becoming a better prepared and more agile as an educator” themes align well with teaching presence because the associated recommendations address the intentional instructional design decisions online educators make to create effective, supportive learning experiences for students.
• The “Establishing presence to encourage a supportive learning community” theme strongly aligns with the goals of social presence in online courses, with the theme’s associated recommendations addressing the quality and quantity of formal and informal social interactions.
• Recommendations shared in the “Supporting student success” and “Providing clarity and relevance through course structure and content presentation” themes are directly related to the interactions students have with course content in support of conceptual understanding and the achievement of course learning objectives.

This alignment with the CoI model—arguably the most popular framework for the research and practice of online learning—has reinforced for us that using crowdsourcing to curate recommendations for teaching online from experienced online educators is a sound approach to broadening the conversation and taking advantage of online educators’ collective intelligence. It has also reinforced for us the soundness of the recommendations online educators shared, and the appropriateness of heeding their advice; the themes and associated recommendations have potential to help faculty new to teaching online courses start out on solid footing, and to help continuing online educators consider alternatives and enhancements to their course design and facilitation.

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We found that crowdsourcing online educators during live professional conference sessions was fruitful, leading to many insightful recommendations. Although crowdsourcing as a research methodology has limitations (see Khare, Good, Leaman, Su & Lu, 2016), our experience in this project well illustrated the central principle of crowdsourcing—that the collective intelligence of a group generally leads to more valuable results than the limited contributions of a few (Howe, 2008). The benefit of this approach for us is that the results are authentic and credible because the source of the results is experienced online educators. Online educators’ recommendations ring true to people learning how to be effective online educators because the recommendations are derived from people who are just like them: educators who care about the quality of the online-learning experiences they design and facilitate and who face similar professional pressures, opportunities, and constraints.

**Conclusion**

Through our analysis of experienced online educators’ recommendations, we identified four themes related to effective online course design and facilitation: (a) supporting student success, (b) providing clarity and relevance through content structure and presentation, (c) establishing presence to encourage a supportive learning community, and (d) becoming better prepared and more agile as an educator. These themes and associated recommendations are relevant for faculty new to online teaching, as well as for those already in the trenches. The work is significant because it captures the lessons experienced online educators have learned about designing and facilitating online courses—based on their experimentation, assessment, revision, and reflection. In addition, the work is an example of how professional conferences can be opportunities for crowdsourcing; this participatory approach recognizes the expertise of our colleagues and our valuing of that expertise. Finally, the work offers an additional data point in the larger scholarly quest for prescriptive guidance to online educators on how best to design and facilitate online courses. Through this work—which we continue to add to, especially in light of the increasing use of synchronous communication and collaboration tools and spaces in online courses—we hope to inspire our colleagues and students to (a) consider their own unique lessons learned, (b) explore different ways to attend to those lessons learned in their online courses, and (c) consider crowdsourcing as a research methodology.

**References**


Online educators’ recommendations for teaching online: Crowdsourcing in action


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Building public health capacity through online global learning

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Abstract
Rising disease burden and health inequalities remain global concerns, highlighting the need for health systems strengthening with a sufficient and appropriately trained workforce. The current models for developing such a workforce are inadequate and newer approaches are needed. In this paper we describe a model for public health capacity building through online Global Learning, defined as “innovative, integrated, global opportunities for capacity building through online learning and shared experiences between and within Low- to Middle-Income Countries and High-Income Countries, in a continuous process that helps health care workers learn as they progress through their careers”. We demonstrate how two programmes, Peoples-uni and NextGenU.org, have implemented this model using a mix of low-cost and free online learning courses, a global community of volunteer tutors, mentors and peers, and appropriate high quality competence-based content.

Keywords: online learning; global health; capacity building; public health; student mentoring

Introduction
This paper identifies the need for a new approach to Public Health capacity building, describes the success of two online education initiatives, and presents an innovative model framework to transform educational practices through global learning to build Public Health capacity.

The need for a new approach
The Global Strategy on Human Resources for Health: Workforce 2030 recognizes the need to boost the global Public Health workforce (World Health Organisation, 2016). Traditional higher education models have proven insufficient and inappropriate to solve the workforce challenge and build capacity, particularly in Low- to Middle-Income Countries (LMICs). The Lancet Commission on Health Professionals for a New Century (Frenk et al., 2010) recommended:

“Redesign of professional health education is necessary and timely, in view of the opportunities for mutual learning and joint solutions offered by global interdependence due to acceleration of flows of knowledge, technologies, and financing across borders, and the migration of both professionals and patients” (p. 1923).
The British Council in its 2015 report *Connecting Universities - Future Models of Higher Education* (British Council, 2015) stated:

"As the traditional suppliers of higher education, universities today are operating in a rapidly changing environment. As well as coping with less resources, traditional learning has evolved: access to information is now freely available online; with smartphones, tablets and an array of digital tools at their fingertips, the habits and expectations of students have changed" (p. 2).

A number of new models of higher education have been proposed, including for LMICs (Nhando, 2015; Mintz, 2014; Epstein & Yuthas, 2012) using advances in technology, and building on the increasing availability of Open Educational Resources (OERs) and open source delivery platforms (Creative Commons, 2016). The development of free Massive Open Online Courses (MOOCs) has increased access for students, although exposure to LMIC audiences has been limited (Wildavsky, 2015), and MOOCs’ consequent credentials and certification are still limited to those who pay. While recognising the limitations of MOOCs, Bill Gates in his 2015 letter includes a whole section focusing on online education titled: “Better software will revolutionize learning” and predicting a “future in which world-class education is only a few taps away for anyone in the world” (Gates, 2015).

**Two examples of online education for Public Health capacity building**

We have previously described our work on building Public Health capacity in LMICs and High Income Countries (HICs) through e-learning, using OERs and volunteer tutors (Heller et al, 2007; Heller, 2009; Galway, Corbett, Takaro, Tairyan & Frank, 2014; Frank et al., 2016; Clair, Mutiso, Musau, Frank & Ndetei, 2016), which have been identified as innovative models for global health education (Crisp & Chen, 2014; Ladner, 2014).

The *People’s Open Access Education Initiative* ([Peoples-uni:](http://peoples-uni.org)) provides low-cost online education to help build Public Health capacity in LMICs ([Peoples-uni:](http://peoples-uni.org)). Modules for continuing professional development or as part of a Master of Public Health (MPH) course, are taught by an international volunteer faculty (including graduates of the programme) and courses are developed using Open Educational Resources. Students can choose from a range of modules on public health foundation sciences (e.g. Health Economics, Health Promotion, Evaluation, Epidemiology, Biostatistics, Health Inequalities and Social Determinants of Health), and topic-based modules (e.g. HIV/AIDS, Preventing Child Mortality, Injury Prevention, Non-Communicable Diseases, Communicable Diseases, Disaster Management and Emergency Planning). To date, 1691 students have enrolled, of whom 30% passed at least one module at the Masters level. In a partnership with a UK University, 128 students who had already passed two modules enrolled on the MPH programme – 94 (73%) graduated with an MPH and a further 18 (14%) gained a graduate Diploma or Certificate. Seventy percent of the students are from Africa and 12% from the Indian sub-continent. Student feedback is very positive, our website ([http://peoples-uni.org](http://peoples-uni.org)) includes testimonials from a number of graduates (such as “Peoples-Uni is a new breathing of life for students from developing countries who can now enrol and learn about public health and contribute to the country needs where public health improvement is urgent”). An active alumni group continues to work together to perform and support collaborative research (Heller, Machingura, Musa, Sengupta & Myles, 2015).

A sister site, *Peoples-uni Open Online Courses* ([http://ooc.peoples-uni.org](http://ooc.peoples-uni.org)), offers self-paced learning in public health - it is freely available in any country. More than 2300 people have enrolled.
on the site and in a report of the first 1174 students (Heller et al, 2017), 15% gained a certificate of completion. Students are spread between LMICs and HICs, although Africa remains the largest geographical source. A wide range of courses is available, many in areas not usually covered in traditional MPH courses, and some developed by or for other organisations.

NextGenU.org is the world’s first organisation that provides credit for free. Accredited courses span from college-level pre-health sciences and community health worker training through medical and public health graduate training, medical residency programs, and continuing medical education. Courses are competency-based, and include online knowledge transfer, a web-based global peer community of practice, skills-based mentorships, and a free certificate. More than 5,000 users have registered from over 200 countries, and NextGenU.org expects to achieve its ultimate outcomes by July 2018: the first globally free degree, a Master’s in Public Health, and Graduate Medical Education (a Preventive Medicine Residency). Founded in 2001, NextGenU.org globally launched its first full course in March 2012, Emergency Medicine (EM) for Senior Medical Students, created in partnership with Emory University’s WHO Center for Injury Control, the International Federation of EM, and the Society of Academic EM. NextGenU.org’s accredited partners, North American universities that are outstanding in each particular course topic, give learners credit for this training (or institutions can adopt them and use them with their students).

The NextGenU.org free model has been tested in North American medical and public health students (Galway et al, 2014; Frank et al, 2016), and in community health workers and primary care physicians in Kenya (Clair et al, 2016), with as much knowledge gain and greater student satisfaction than with traditional courses, and the creation of a community of practice that has learned to interact globally and productively. While the rates of completion by individuals is low and similar to that of MOOCs, when these NextGenU.org courses are adopted by institutions, there is essentially 100% completion.

Both Peoples-uni and NextGenU.org are committed to the quality of their educational approaches and have a number of structures and policies in place to ensure that teaching quality will be maintained over time. Partnering with other educational organisations that offer their own quality assurance is also a way of maintaining quality. Although both programmes evolved separately, and differ somewhat in detail, they each respond to a common need and to the opportunities for online learning in the digital age. Presenting them together in this way, in the context of a general model, we hope will encourage others to replicate and expand this approach.

The Global Learning model

We define Global Learning as “innovative, integrated, global opportunities for capacity building through online learning and shared experiences between and within Low- to Middle-Income Countries and High-Income Countries, in a continuous process that helps health care workers learn as they progress through their careers”. Educational programs are developed and delivered for relevant needs at various stages, with a progression from learning to leadership, as demonstrated in Figure 1 – the Learning Ladder. We have identified a number of key ingredients for online Global Learning, including Information and Communication Technology, the need for a global context and multidirectional learning, a focus on further educational developments, as well as lifelong learning though career progression. The features of these ingredients are described in Table 1.
Figure 1: The Learning Ladder

Table 1: Key components and features of Global Learning

<table>
<thead>
<tr>
<th>Key components</th>
<th>Features</th>
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<tbody>
<tr>
<td>Information and Communication</td>
<td><strong>Online learning; best international Open Educational Resources; collaboration and networking across boundaries, including student/teacher interactions</strong></td>
</tr>
<tr>
<td>Technology</td>
<td></td>
</tr>
<tr>
<td>Global context</td>
<td>Global health challenges that are common to all settings covered; volunteer tutors from HICs* and LMICs**, costs affordable for HIC and LMIC students</td>
</tr>
<tr>
<td>Multidirectional learning</td>
<td>Learning between and within HICs and LMICs, and between local and/or global mentors/tutors and students and between local and/or global peers</td>
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<tr>
<td>Focus on further educational</td>
<td>New content, delivery channels and awards developed during program, and through new partnerships</td>
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<tr>
<td>developments</td>
<td></td>
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<tr>
<td>Lifelong learning though career</td>
<td>Appropriate for career stage; alumni engaged in education, research and advocacy</td>
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<td>progression</td>
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</tr>
</tbody>
</table>

* High-Income Countries.
** Low- to Middle-Income Countries.

Conceptual model

Our approach leans on a new conceptual model of education, relevant to the digital age, Connectivism, which:

* presents a model of learning that acknowledges the tectonic shifts in society where learning is no longer an internal, individualistic activity. How people work and function is altered when new tools are utilized. The field of education has been slow to recognize both the impact of new learning tools and the environmental changes in what it means to learn. Connectivism
provides insight into learning skills and tasks needed for learners to flourish in a digital era” (Siemens, 2005, n.p.).

Our model of Global Learning is an extension of Connectivism to offer an innovative and practical approach to the enormous problem of global Public Health human resource shortages.

**How to deliver the model**

**Preliminary:**
- Assemble cohort – shared interest/affiliation/geography plus desire to learn about Public Health
- Identify needs and availability

**Develop knowledge and skills for independent practice:**
- Provide access to online courses – self-paced or supported with facilitated discussions, mentorship and possible addition of face-to-face or flipped classroom
- During the programme and among alumni, students collaborate to learn from each other
- Offer certification/credit/academic award (MPH)

**Develop skills as trainer and leader:**
- Collaborative research among graduates
- Facilitate and develop further educational opportunities for the graduates
- Graduates join programme teaching staff and develop own educational products

The aim is to create an iterative process of education and feedback with increasing depth and widening range of delivery methods. Once started, feedback on future learning needs will enable the development of future content and delivery channels, enabling progress through the Learning Ladder, from healthcare student, to practitioner, then trainer and leader. This creates the possibility of globally, sustainably, and permanently transforming health sciences education, and filling in the enormous gaps in health worker capacity.

**Outcomes of the model**

The framework depends upon internet-based e-learning, and on a global network of volunteer tutors and students. It encourages collaboration, and allows education to cross both geographical and professional boundaries, facilitating learning between countries and across income settings, and allowing students to maintain their current employment, not depleting vital local manpower.

Volunteer tutors, including alumni of the original programmes, work as an online network, thus defraying costs and travel and minimising environmental impact, and time expenditure. This, together with the use of Open Educational Resources, allows lower investment in infrastructure.

Further opportunities include the possibility of more intensively supplementing e-learning with face-to-face mentored and peer-based education, where this is feasible and cost effective. Other individuals and organisations can be encouraged to collaborate and partner to develop further educational programmes.

Lastly, this framework allows us to explore how global learning can be built into current undergraduate and graduate education and training programmes in HICs (Galway et al, 2014; Frank et al, 2016; Jones, Beanland & Mathew, 2013). In this way, the model offers the potential for increased knowledge of global health problems amongst those working in high-income settings, as well as expanded and quality-assured opportunities for those offering their skills as volunteer tutors.
Challenges

There remain a number of challenges to the model. The traditional higher education system is often resistant to change, and the sustainability of educational programmes such as those we describe, which are sited outside the traditional system, is difficult to predict, and depend on the credibility offered to them by healthcare organisations and employers. The financial viability of free and low-cost courses also remains a challenge. A reliance on volunteers is a risk, as well as a strength, and efforts will have to be continued to ensure that the quality of the education is maintained over time.

Conclusions

The Global Learning model we describe: “innovative, integrated, global opportunities for capacity building through online learning and shared experiences between and within LMICs and HICs, in a continuous process that helps health care workers learn as they progress through their careers” creates the possibility of globally, sustainably, and permanently transforming health sciences education, and filling in the enormous gaps in health worker capacity. Debate and collaboration with others will allow global learning to be scaled up and adapted to support capacity building for health systems.

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