Editorial – Volume 14, Issue Number 4

Dianne Conrad
Co-Editor, IRRODL

It is a terrifying honour to be entrusted to write this editorial for the first issue of *The International Review of Research in Open and Distance Learning* for which my co-editor, Dr. Rory McGreal, and I are now jointly responsible. Rory and I extend our thanks to our colleague Dr. Terry Anderson who has steered the *IRRODL* ship so energetically and astutely for the past 10 years. Terry's leadership has placed *IRRODL* in the forefront of our field's academic journals and Rory and I will work hard to maintain the level of quality that you have come to expect. And quantity! Volume 14, Issue 4 offers readers 14 research articles and one leadership note from all corners of the globe – a splendid feature that has become a hallmark of this journal.

In a fitting opening to such a large and varied issue, the UK's Alan Tait, a familiar voice in our field, presents a framework of ideas drawing in particular on the capability approaches proposed by Amartya Sen in order to analyse theories of development and social justice that are claimed or may be inherent in the mission statements of 12 of the world's leading open universities. Supporting his premise with references to similar large-scope works by colleagues such as Rumble, Daniel, Bowles and Gintis as well as his own previous work, and citing incidents from institutions such as the Commonwealth of Learning and UNESCO, he concludes that reviewing institutions' statements of purpose and strategy will help them rise above operational levels that are potentially rhetorical.

Wayne Atchley, Gary Wingenbach, and Cindy Akers from Texas tackle another recurring topic in our field, that of comparing completion and performance between traditional and online courses. Recalling Russell's well-known "no significant difference" study (2001), the authors found that there were differences in completion rates among disciplines; however, student characteristics such as age, gender, ethnicity, classification, major, and experience with online course delivery were not considered in this research, and more study will be necessary to further understand the nature of learning in the many formats available to us today.

Somewhat similarly, Chadchadaporn Pukkaew's Thailand-based study compares the results for distance and non distance students in a computer programming class using a VCLass live e-platform and found that all participants, including the instructor, preferred using Facebook as a social networking tool over the computer-mediated communication tools available through the platform.

The critically important issues of online community, empowerment and engagement are also at the heart of Yu-Chang Hsu and Yu-Hui Ching's article on non-programmer adult learners' experience with mobile apps. Hsu and Ching found that students appreciated the rich level of peer support in their virtual learning community and they conclude that their study shows the educational value of mobile app design activities, and the possibility and practicality of teaching/learning mobile app design online.

In exploring the application of another current platform, Scott P. Anstadt, Shannon Bradley, and Ashley Burnette surveyed users of educationally and health focused SIMS (simulations) to discover what motivates their Second Life (SL) and real life (RL) interactions in several areas, potentially addressing the future role of educating social work students regarding research methodology in online virtual reality interactions. Implications for social work are discussed including engaging clients using incentives for social participation built into the SL milieu.

In keeping with Tait's "let's examine our institutional *raison d'etre*" focus and Atchley, Wingenbach, and Akers' consideration of comparative performance, this issue contains several other articles that take the wide view on emerging and intriguing issues within ODL. Ross McKerlich, Cindy Ives, and Rory McGreal contemplate the OER initiative, now a decade old but slowly gaining acceptance in higher education. Using a survey to measure the readiness of faculty and staff to adopt OER, their research identifies factors to increase the readiness of faculty and staff to adopt OER, finding that creating OERs encourages greater acceptance of open resources than merely using them.

Ishan Sudeera Abeywardena, Chee Seng Chan, and Choy Yoong Tham, in another OER-themed article, lament the lack of viable search engines to locate appropriately academic OERs for teaching purposes. Their research puts forth OERScout, a technology framework based on text-mining solutions.

This issue's third OER-themed piece, by John Levi Hilton III, Donna Gaudet, Phil Clark, Jared Robinson and David Wiley, considers the high cost of textbooks as a concern not only to college students but also to society as a whole. To this end, their research examined one community college's adoption of a collection of open resources across five different mathematics classes and compared results between the previous two years in terms of the number of students who withdrew from the courses and the number that completed the courses with a C grade or better, finding no significant change in educational outcomes but a cost saving to students and a generally favourable perception of the technology.

Like OERs, MOOCs are also exciting "new kids" on the ODL block, represented in this issue in an article by Jenny Mackness, Marion Waite, George Roberts and Elizabeth Lovegrove that reports on an investigation into the pedagogy in Oxford Brookes University's First Steps in Learning and Teaching in Higher Education MOOC. Using this relatively small MOOC (200 participants registered from 24 countries), the study sought to provide evidence on how learning occurred in the course and also considered implications for teaching and learning in higher education. The researchers concluded that small, task-oriented MOOCs can effectively support professional development of open academic practice and found that MOOC "veterans" served as role models and strong supports for the less experienced.

This issue also includes several geographically focused pieces that attend to important concerns within our field. In one such article, Hyoseon Choi, Yekyung Lee, Insung Jung and Colin Latchem focus on the relationship between learners' personal factors and perceived barriers for DE at the Korea National Open University, concluding that this study may go some way towards suggesting how to create practical support systems that fit the different needs of various student groups in any distance education provider. Mann Hyung Hur and Yeonwook Im, also working with data from Korea but from the government sector, explore the influence of e-learning on individual and collective empowerment by using data collected from e-learning class participants of Korea's Cyber-Education Center, finding that online discussion classes, if designed to encourage interactivity, can enhance the promotion of empowerment.

From China, Yi (Leaf) Zhang explored the influence of Confucian-heritage culture on 12 Chinese learners' online learning and engagement in an online course in a southwestern US university. Chinese learners, intimidated by their instructors and viewed in an authoritarian light, tended to seek help from peers, particularly those who shared similar cultural and linguistic backgrounds.

From South Africa, Lynette Jacobs and Corene De Wet report on an alliance formed to develop a short credentialing programme to address a training gap for Further Education and Training college (FETC) lecturers. Jacobs and De Wet hope their results may inform and support the future development of a full credential for FETC lecturers. The need for enhanced student support and improved administration is also highlighted by their study.

And from Canada, Robert Power offers a note on leader-member exchange theory in higher and distance education.

What better way to conclude this wide-ranging introduction of IRRODL's Volume 14, Issue 4 offerings than by the mention of Jen Ross, Michael Sean Gallagher, and Hamish Macleod's piece from the "New Geographies of Learning" project, a research project exploring the notions of space and institution at the University of Edinburgh, and from literature on distance learning and online community? Examining the comings and goings, and arrivals and departures of part-time distance students, they suggest a fluid

and temporary assemblage of engagement, not a permanent or stable state of either "presence" or "distance," and they conclude that interruptions and subsequent returns should therefore be seen as normal in ODL, and teachers and institutions should work to help students develop *resilience* in negotiating various states of "nearness". Strategies for increasing this resilience are proposed. Resilience, space, presence and non-presence, the "comings and goings" of engagement at a distance – are these not all facets of our struggle to establish identity as teachers and learners as our palates become ever more varied and colourful?

Athabasca University

Distance and E-Learning, Social Justice, and Development: The Relevance of Capability Approaches to the Mission of Open Universities

Alan Tait
The Open University, U.K.

Abstract

This article reviews the discourse of mission in large distance teaching and open universities, in order to analyse the theories of development and social justice that are claimed or may be inherent in them. It is suggested that in a number of cases the claims are unsupported or naive. The article goes on to set out the nature of Amartya Sen's capability approach for development, and to identify its potential for reviewing distance and e-learning more widely as a contributor to development and social justice.

Keywords: Distance and e-learning; open and distance learning; open universities; distance teaching universities; on-line learning; development; development theory; social justice; Amartya Sen; capability approaches

Distance and E-Learning, Social Justice, and Development : The Relevance of Capability Approaches to the Mission of Open Universities

Tait

Introduction

For many individuals working in the field of distance and e-learning, a significant element in our commitment has been informally or formally to frame programmes of study as interventions to deliver social and economic change, that is some deliberate change in social or economic relationships that shifts the balance of livelihoods and wellbeing in a given context, and in particular to deliver increased equity. This is recorded as the case by a number of those who have occupied leadership positions (see Daniel, 2001; Paul, 1990; Zaki, 1997). This is as true in the richer countries, with their social segmentation and lack of equity in opportunity, not to speak of relative poverty, as in the poorer countries. It is at the same time true that it is not always easy for educators, perhaps in particular at the tertiary level, to see education not as a thing in itself but as a set of activities that delivers outcomes for individuals and societies. But if social change is our goal, this must be so. If educators accept that they have a role as workers in development, we then have to ask ourselves how we understand that process. This article is dedicated to that enquiry.

At institutional level too, many institutions working in the field of open, distance, and e-learning claim development goals within their mission, sometimes with an explicit reference to social justice. This article will review some of those claims, and ask what theories of development are inherently presented, and whether they are adequately theorised to be able to act as more than aspiration or rhetoric. It will seek to present a framework of ideas drawing in particular on the capability approaches proposed by Amartya Sen. The capability approach seeks to deliver freedoms 'to be and to do' *with* participants not *to* subjects of development, and is set out at greater length below. The outcome of discussion is intended to help institutions and individuals in understanding how to plan in distance and e-learning contexts to deliver change through development and contribute to social justice.

Institutional Missions

Below are reproduced a set of extracts from the mission and vision statements or similar texts from the websites of 12 major distance teaching universities (DTUs) around the world. Major distance teaching universities which reproduced purposes only associated with educational rather than social or developmental goals are not included here. Institutions from the regions of North America, Europe, Africa, and Asia are cited.

The selection of texts does not claim to be comprehensively representative but serves as a set of examples. The sampling from institutional mission statements has followed the theme of development, and in terms of validity is closer to the constraints of case study methods that provide illumination of ODL and development in a number of contexts.

Distance and E-Learning, Social Justice, and Development : The Relevance of Capability Approaches to the Mission of Open Universities

Tait

Allama Iqbal Open University, Pakistan	The Allama Iqbal Open University was established in May, 1974, with the main objectives of providing educational opportunities to masses and to those who cannot leave their homes and jobs. In the last 34 years, the University has more than fulfilled this promise. It has opened up educational opportunities for the working people and has provided access to the females on their door steps. It has also done pioneering work in the field of Mass Education. It is now breaking new grounds in the fields of professional, scientific, and technical education. It is attempting to reach out to the remotest areas of Pakistan. It is also attempting to harness modern information Technology for spreading education in Pakistan. (Allama Iqbal Open University, 2013)
Athabasca University	Athabasca University, Canada's Open University, is dedicated to the removal of barriers that restrict access to and success in university-level study and to increasing equality of educational opportunity for adult learners worldwide. (Athabasca University, 2013)
Indira Gandhi National Open University (IGNOU)	The Indira Gandhi National Open University (IGNOU), established by an Act of Parliament in 1985, has continuously striven to build an inclusive knowledge society through inclusive education. It has tried to increase the Gross Enrollment Ratio (GER) by offering high-quality teaching through the Open and Distance Learning (ODL) mode. (IGNOU, 2013)
National Open University of Nigeria	Mission To be regarded as the foremost University providing highly accessible and enhanced quality education anchored by social justice, equity, equality and national cohesion through a comprehensive reach that transcends all barriers. (National Open University of Nigeria, 2013)
The Open University UK	Mission We promote educational opportunity and social justice by providing high-quality university education to all who wish to realise their ambitions and fulfil their potential. (Open University, 2013)
Open University of China (was CCRTVU)	The OUC upholds the core values of "Openness, Responsibility, Quality, Diversity and Internationalization". It strives to meet the needs of China's developing society and economy, and to satisfy the personal development needs of the people, particularly the educational needs of rural areas, remote areas and ethnic minority regions. The OUC shoulders its social responsibility and promotes education equality by providing flexible and diversified educational services that deliver quality educational resources. (Open University of China, 2013)
Open University of Malaysia	Adopting the motto 'University for all', OUM believes in the democratisation of education; giving everyone a chance at self-actualisation and fulfilling their potential. (Open University of Malaysia, 2013)

Distance and E-Learning, Social Justice, and Development : The Relevance of Capability Approaches to the Mission of Open Universities

Tait

Open University of Tanzania	**Vision** To continuously provide quality open and distance education, research and public services for sustainable and equitable socio-economic development of Tanzania in particular and rest of Africa. (Open University of Tanzania, 2013)
Wawasan Open University (Malaysia)	Established in 2006, it uses flexible approaches to make higher education accessible to all – anytime, anywhere – and to create a lifelong learning community for aspiring individuals regardless of their previous educational, ethnic or socio-economic background. (Wawasan Open University, 2013)
Universidad Nacional de Educacion a Distancia (UNED, Spain)	Since 1972, UNED has sought to translate into action the principle of equal opportunity in access to higher education through a methodology based on the principles of distance learning and focused on the needs of the student. (UNED, 2013)
University of Phoenix	University of Phoenix provides access to higher education opportunities that enable students to develop knowledge and skills necessary to achieve their professional goals, improve the productivity of their organizations and provide leadership and service to their communities. (University of Phoenix, 2013)
University of South Africa (UNISA)	**Vision** Social justice and fairness: Inspired by the foundational precepts of our transforming society, social justice and fairness animate our strategy, guide our efforts and influence our imagined future. (UNISA, 2013)

Analysis of Open and Distance Teaching University Missions

It can be noted that seven universities claim equity and equality of opportunity as goals: Athabasca, NOUN of Nigeria, Open University UK, Open University China, Open University Tanzania, UNED Spain, and UNISA South Africa. IGNOU also talks of an 'inclusive knowledge society', while Phoenix and Wawasan highlight making higher education accessible. Allama Iqbal OU of Pakistan prioritizes inclusion for women and remote communities. OU China also identifies the rural and remote communities, along with ethnic minorities as priorities for inclusion. Wawasan of Malaysia also mentions as a priority inclusion on an ethnic basis. OU Tanzania alone explicitly identifies sustainable development as a goal. OU Malaysia highlights 'democratization of education' as a priority. National and nation building goals are identified such as 'an inclusive knowledge society' (IGNOU); 'national cohesion' (NOUN); 'China's developing society' (OU China); 'the socio-economic development of Tanzania' (OUT); and UNISA proposes to contribute to 'our transforming society'. Scale of opportunity is mentioned

Distance and E-Learning, Social Justice, and Development : The Relevance of Capability Approaches to the Mission of Open Universities

Tait

by AIOU Pakistan ('mass education') and by IGNOU India with its commitment to increase the Gross Enrolment Ratio. The opportunities for learners are explicitly mentioned by Athabasca of Canada; OU UK which talks of 'all who wish to realise their ambitions'; OU Malaysia which aims to 'give everyone a chance at self-actualisation'; University of Phoenix which promotes access to higher education in particular for professional and vocational outcomes; and Wawasan Malaysia who welcome 'aspiring individuals'. Three universities use the term 'social justice', that is, NOUN of Nigeria, Open University UK, and UNISA of South Africa.

We should not assume that because a priority is not mentioned in the particular text highlighted here it is not mentioned elsewhere by a university; nor should it be assumed that institutions not mentioned may not have similar or indeed differing priorities. Nor lastly can it be assumed that priorities of development highlighted in institutional statements are always carried through with programmes of activity, and are evaluated against their mission goals, although of course in well-led and managed institutions this will be the case. We should also note the distinction between the ODL mission contributing to equity in educational provision, for example, making higher education more accessible to all, and those that contribute to equity more widely in society through education. In the latter category we have the OU China and UNISA, as expressed through their mission statements. This raises for consideration the scope of a university's ambitions for development in a social and political context.

The major point however is to indicate that in a relatively cursory examination what major distance teaching universities in a range of geographies and economies, both 'developed' and 'developing', say about themselves is deeply embedded in development discourse and the politics of social change. Open universities cited here positively associate distance and e-learning with their delivery of goals of development defined in such ways. In summary most of these universities do not accept the current availability of opportunity as either fair or adequate, and intend through their activities to change it.

The range of approaches developed by the DTUs and other universities with substantial deployment of distance and e-learning is at core about the affordances that are delivered through the separation of time and space, and through the use of technologies to innovate in both pedagogy and logistics. These affordances above all deliver flexibility regarding time and place that permits study alongside work and family; includes people in geographies that would otherwise be excluded; supports the inclusion of women where independent movement to study on a campus is restricted, and of the house bound, the disabled, and the imprisoned for whom study on the campus is not possible; it can permit study by individuals otherwise excluded by cost where distance and e-learning has been able to lower cost as against other educational systems; and through scale can provide opportunities for far more people than would otherwise be possible. More generally, through scale and flexibility it can in terms of social policy provide a pressure valve to release frustration about educational opportunity; can

Distance and E-Learning, Social Justice, and Development : The Relevance of Capability Approaches to the Mission of Open Universities

Tait

deliver large scale opportunities for professional development that support improvement in quality of service and economic growth; and can support the development of an educated citizenry and so nourish self-fulfillment and democracy.

Theories of Development

How might this combination of the aspirations of and affordances available to the open and distance–teaching universities contribute to development? Development starts, as observed above, from a fundamentally non-conservative position, to the effect that society is not as it should be and change for the better can and should be planned for and delivered. Distance teaching universities, whether single-mode or blended in their modes of study, by virtue of their ambition for and potential scale of contribution to development are therefore political actors (Tait, 1989, 1994, 2008). Given the centrality of that framework of ideas in the cited extracts from statements of mission and so on of the DTUs above we might expect, even in these fragments of text, to find some evidence of understanding about how development is understood. However there is very little clue. The span of understanding ranges from human capital theory, to inclusion of the excluded, and in some cases to the explicit if unsupported use of the term social justice. The University of Phoenix, a substantial on-line as well as blended study for–profit university, does not state any larger social vision for change, and limits itself to supporting student advancement in the workplace. As an institution it would appear that it could without difficulty work within current social and economic structures, which is starkly in contrast with the other mission statements and related texts from the open and distance teaching universities. We thus have, as earlier noted, across a range of university missions those who have explicit goals for achieving wider equity in society, through those who aim primarily to achieve wider access to education, to those who have no explicit commitment to equity. This is of course likely to be true across universities as a whole not only those which are founded on open and distance learning approaches.

The range of theories of development available for consideration is broad. It includes understandings of the world that progress is built primarily on economic growth and that poorer countries should become like richer countries, to a scepticism or hostility to the sustainability of economic growth as an uncontested good. While in most cases education is seen as an essential contributor to the human capital that countries need to grow economically and socially, there is a counter view that education especially at tertiary level provides legitimacy for a filter for the labour market as much as it provides real skill and knowledge essential for employment (Bowles & Gintis, 1976). Development is in other words a contested concept, and a university that commits itself to development needs to have a position articulated and adopted.

Within that range of possibilities for the meaning of development, the most dominant set of ideas over the last 20 years or so, especially for international governmental organizations, has been the human development model pioneered by UNDP through its

Distance and E-Learning, Social Justice, and Development : The Relevance of Capability Approaches to the Mission of Open Universities

Tait

annual World Development Reports. These began in 1990 with the celebrated but at the time challenging statement 'People are the real wealth of a nation' (UNDP, 2010, p. 1), which lay in contrast with the World Bank approach to development at that time of GDP growth being the simple goal and measure for development (The Economist, cited in UNDP, 2010, p. 14). While Mahbub Ul Haq was the progenitor of this new approach in the UNDP, including the idea that the capacity to make choices was core to a framework for development, his partner at the time in this rethinking was Amartya Sen whose work developed under the title of capability approaches has subsequently become dominant. In brief, development activity should seek to support capabilities in people 'to be and to do'. The approach has an existential commitment to human freedom to choose those capabilities, constrained as those freedoms may be by context. Capabilities are supported by sets of skills and activities, known in Sen's terminology as 'functionings'. The skill of reading may for example support the capability for an individual to be the person she or he wants, and to gain a livelihood in a more fulfilling and materially rewarding way. This approach to development has been very influential in international governmental organisations charged on behalf of their governments with development goals over the last 20 or more years. It is therefore this set of ideas, and their relevance for ODL and the purposes of ODL-focused institutions and organizations, that I want to explore in the remainder of this paper.

Development, Social Justice, and Open and Distance Learning

Three DTUs frame their mission or vision explicitly in terms of social justice, as noted above. What might they mean by that? The roots are both religious and secular, with the notion developed through the French Revolution from whence we hold the notion of universal human rights, but used also over a long period by the Roman Catholic Church in its positive option for the poor (Tait & O'Rourke, 2013). At core is a commitment to equality of human beings, the development of programmes of activity to deliver inclusion of the great majority in the benefits of society, and solidarity with those in need. It is easy to see how an intention to include the excluded, and to support those who have been denied opportunity, would develop as the missions of open universities and DTUs and that the term social justice could be used to frame such missions.

However there is no worked out and articulated framework of understanding as to what a development framework for ODL might look like. Earlier works such as Rogers on adult learning more broadly assert the need for such a framework in richer as well as poorer countries, and evaluate the range of development ideas available. Many of the questions raised remain relevant for ODL, in particular the critique of human resource development as making objects of 'target groups' rather than subjects of development (Rogers, 1990). More specifically for ODL, Wall in writing about distance education with indigenous people in the North of Canada asserts the importance of partnerships, working with communities, and this is further emphasized by Haughey in the same volume (Haughey, 1990, p. 35).

Distance and E-Learning, Social Justice, and Development : The Relevance of Capability Approaches to the Mission of Open Universities

Tait

UNESCO in its policy document on open and distance learning (ODL) explicitly linked its importance for the achievement of the right to education for all , and emphasized the significance for development of ODL's deployment of technologies for learning in educational contexts (UNESCO, 2002, pp. 13-19). Perraton makes an extended and sceptical examination of the claims of ODL to contribute to development in the South, and identifies the high incidence of non-completion as a major stumbling block to the recognition of those claims (2000). Perraton also identifies four factors as driving the expansion of ODL: increasing access, economic development, technology, and cost-saving (2004, pp. 18-22). Reza asks still pertinent questions about how the impact of ODL can be assessed in terms of personal, social, and economic measures, and laments the absence of adequate data. She nonetheless concludes that there are benefits to its target audience but that future policy in this area must be informed by further research (2004, p. 221).

Rumble has focused in the context of ODL on one aspect of social justice, namely the contribution ODL can make through the provision of education at prices affordable to the poor through redistributive taxation (2007). Such an argument, and its accompanying polemic against neo-liberal approaches to society in general and education in particular, would, if applied, at least arguably contribute to access to education, a necessary condition for social justice to be delivered. Outside continental Europe however that argument is not followed at least at tertiary education level, and indeed in England has recently been comprehensively dismissed by recent fees and funding policy for higher education, where university education has been positioned as a private not a public good. Kirkpatrick argued that ODL is central to delivery of the Millenium Development Goals, and in particular draws attention to the scale of impact on teacher education in African contexts (2008, pp. 26-28). Harreveld reviews teacher education in developing contexts and critically assesses Sen's capability approach for in-service education of teachers as a means to support their freedom as 21st century knowledge workers (2007, pp. 51-53).

While the promotion of access within a framework of economic development is a necessary condition for any contribution to social justice to come from ODL, nowhere is there proposed a theoretical and substantive understanding of what development is, or how it works, nor do such accounts lead to a comprehensive account of what should be done in terms of curriculum and pedagogy to support such aims. To support that higher level aim, Tait and O'Rourke have developed a framework for assessing the extent to which an ODL institution is able to contribute to social justice in order to support the delivery of concrete outcomes rather than undefined aspirations. Sen's capability approach however provides an overarching framework of understanding of development that can support the aspiration to serve social justice and ensure the orientation of policy and practice to ensure delivery.

Distance and E-Learning, Social Justice, and Development : The Relevance of Capability Approaches to the Mission of Open Universities

Tait

Capability Approaches and Education

Education, primarily adult literacy and school enrolment, was included, along with life expectancy and GDP per capita, to create a more complex set of measures than just GDP with which to assess development in the first UNDP annual report to address the issue in 1990 (Saito, p. 22). This new set of measures was known as the Human Development Index (HDI). Education has thus been part of the overall framework of ideas which became the capability approach from the beginning, along with the notion of freedom to make choices.

It has however taken longer than expected for the ideas of the capability approach to make their way as an explanatory framework into education and in particular into the tertiary and higher education sectors. Saito summarizes Sen's view on the contribution that education can and should make to human capability:

> The human capital received from education can be conceived in terms of commodity production. However Sen argues that education plays a role not only in accumulating human capital but also in broadening human capability. This can be through a person benefiting from education 'in reading, communicating, arguing, in being able to choose in a more informed way, in being taken seriously by others and so on. (2003, p. 24)

Saito points out also that education may not necessarily improve capabilities, as some kinds of education may even reduce them (rote learning, for example). While her comments relate to children and compulsory education they are highly relevant to tertiary and ODL approaches:

> It seems appropriate to argue that education which plays a role in expanding a child's capabilities should be a kind of education that makes people autonomous. (2003, p. 28)

Discussion of the capability approach contribution to understanding the role of education in development has continued to be discussed in the schools sector. With a focus on inclusion and equity, Walker has written that "Inequalities of gender, race and disability are included in and fundamental to the space of functionings and capabilities" (2006, p. 166), to which we should also surely add socio-economic class as a powerful distributor of opportunity. Walker adds elsewhere

> If schools and universities are places where identities are formed, where we learn to be as well as to know, how

Distance and E-Learning, Social Justice, and Development : The Relevance of Capability Approaches to the Mission of Open Universities

Tait

> much greater the responsibility for teachers to act and to think about what identities and what capabilities to function are being distributed. (2005, p. 109)

Walker's investigation of what is important to girls in school in South Africa leads her to conclude that we "have three provisional education capabilities: personal autonomy, paid work and social relations" (2006, p. 169). Walker goes on to generate a list through interviews of capabilities wanted by the girls of autonomy; knowledge (with caution re: the Freirian notion of 'banking of knowledge' and a positive emphasis on critical thinking); social relations; respect and recognition; aspiration; voice; bodily integrity and bodily health; and emotional integrity and emotions (2006, pp. 179-180). What Walker has done for schools here is to develop, using the capability approach, answers to the question "How will schools enhance the possibilities for its girl students to be and to do, and to have freedom to do so?". It is worth noting that Walker has developed this approach in a particular context for a particular group, as Sen had intended (he gave no overall definition of what capabilities should be). This is different from Nussbaum's position that such a list could be developed universally (see Nussbaum, 2011, pp. 33-34 and Tait & O'Rourke, 2013, for discussion of this). Walker's work leads to the question as to how institutions such as open universities and DTUs should develop an understanding of the ways in which they hope to build the capabilities of their students, deploying their particular approaches to learning and teaching, and in the particular contexts in which they work.

The use of the capability approaches framework in the tertiary sector has been slim, but Watts and Bridges (2006) have analyzed the discourse of access to higher education. They have critiqued the top-down nature of such policies in England, valuable though the goal may in general be to increase the study at university of a wider range of socio-economic backgrounds, on the grounds that the benefits are assumed rather than deriving from the young adults whom such policies are designed to serve. The Senian notion of freedom to choose is thus ignored. This may serve to explain the limited success that a decade of such Widening Participation policies and accompanying funds have had over the last decade in England in shifting the proportion of entrants to higher education from poorer socio-economic groups (Shepherd, 2011).

Capability Approaches and Open and Distance Learning (ODL)

The Commonwealth of Learning, which focuses its mission on the contribution that innovation in learning and in particular ODL can make to development, is the first institution to propose the use of capability approaches in the ODL field. COL sets out its position clearly on both how development is to be framed and how education for development is to be understood.

Distance and E-Learning, Social Justice, and Development : The Relevance of Capability Approaches to the Mission of Open Universities

Tait

The organisation's *Three Year Plan 2012-15* states that

> Following the ideas of development economist and Nobel laureate Amartya Sen, COL understands development as freedom. Increasing the freedoms that men and women enjoy is a definition of development, and greater freedom empowers people to be more effective agents of development. (2012, p. 9)

It can be inferred that it is the framework of learning for development, rather than innovation in learning per se, that has over the last decade brought for COL the explicit use of the dominant framework for development of the capability approach.

To bring the capability approach into more focus for ODL, we would need as Walker did for girls in schools in South Africa, to work with students to identify how ODL approaches could help them deploy freedom to choose to be and do. It is proposed therefore that a concern for social justice as expressed through mission statements of open and distance teaching universities must be supported by clearer thinking about what that means and how it is to be delivered, and further that the capability approach provides a very powerful account of what it might be that these universities are trying to provide equity for, that is, the capabilities of their successful students to be more free 'to be and to do', supported by the functionings that they develop through study.

Building on the social justice audit approach proposed by Tait and O'Rourke (2013), the following schematic approach could at this stage be developed.

Access and Recruitment

There is a crucial difference between policies of access and recruitment and what is conventionally understood as marketing. For development purposes within a framework of the capability approach an institution will need to identify which socio-economic groups have been historically excluded. Thus there is a positive bias to recruit not only from those who are eager to take advantage of opportunity, but those for whom it may be culturally and socially unfamiliar and challenging. This makes access and recruitment a qualitatively different activity from 'identifying the market' in a more familiar commercial sense. This is not to say that the latter may not be an essential part of the portfolio of recruitment activity in order to ensure institutional viability, but it is not adequate on its own if the institutional mission adopts the discourse of development and inclusion, as we have seen many open and distance teaching universities do. The balance between commercial marketing and access for development purposes will need to be judged according to resources and contexts, but should not in good faith be a tiny fig leaf for an overall commercial approach to significant intervention in the current structures of societal opportunity and disadvantage. Bringing the two discourses of

Distance and E-Learning, Social Justice, and Development : The Relevance of Capability Approaches to the Mission of Open Universities

Tait

marketing and development together is a crucial task for open and distance teaching universities.

Equally, following the cautionary outcome of work by Watts and Bridges (2006), the Senian perspective demands for the target groups for recruitment to open and distance teaching universities not the status of children for whom good is determined by adults, but a framework of understanding that explains clearly what support to livelihood and identity formation study can bring, and which seeks to ensure that potential students make their own choice and are enhanced in making the choice (their capacity to be free to choose). Thus right at the start of a discussion of the contribution that capability approaches can make to ODL we see a clear move away from top-down 'welfarism', perhaps more dominant at the time of the foundation of many open and distance–teaching universities, at the same time as there is a refusal to accept current social structures, or neo-liberal approaches to markets alone, as determinants of social outcomes.

Programmes of Study

The programmes of study that are adopted by an open university represent significant strategic choices as to the most effective way to deliver on its development aims. This creates a qualitatively different rationale for curriculum strategy than the inheritance of classic disciplines or indeed the primacy of academic choice or preference. This can bring significant tension with the traditional understanding of many academics as to how university curriculum should be constructed and their rights within that process. With the adoption of the capability approach as an overarching framework an institution has to ask itself explicit questions as to how it will help students exercise their freedom 'to be and to do'. Thus programmes of study need to be adopted and developed that will empower successful students to make choices about the sort of person they aspire to be, and the ways in which they gain livelihoods. In other words programmes of study need to centre themselves on outcomes for students.   These choices derive from students present and future, supported but not supplanted by the academic and professional skills in the university.

This represents particular challenges for open and distance teaching universities where curriculum production takes place all too often not with students but for students on a campus where students are for the most part absent. Curriculum innovators thus have a subtle and complex task to negotiate the interests of students, the academic community, and externally society and government, in order to create programmes of study that acknowledge the centrality of outcome of students' freedom to choose. This is particularly true where the status of future students within a set of power relations is not strong, nor is the professional understanding in the context of university study necessarily one of equals. Nonetheless, this tension of power relations in development contexts is near universal, and university education cannot claim any exceptionality.

Distance and E-Learning, Social Justice, and Development : The Relevance of Capability Approaches to the Mission of Open Universities

Tait

Learning, Teaching, and Student Support

While learning, teaching, and student support have core roles in delivering the learning outcomes of programmes of study and supporting the success of students, the capability approach provides us with a higher level framework for understanding how we should construct and direct learning, teaching, and student support strategies for open universities. If freedom to choose to be and to do represent the desirable outcomes for students, we can then review the strategies to support independent learning, the pedagogies that underpin assessment, and completion, in that light. The range of needs of a heterogeneous student body also argues for flexibility rather than uniformity in supporting students, which at the same time brings challenges for the notion of equity. Very important are the strategies to support student completion, as open and distance teaching universities are prone to publicize their recruitment figures and not their student completion data (Simpson, 2010).

Conclusion

At a time of increasing commercialization and commoditization of higher education there is a need to protect the development character of higher education institutions and in particular open and distance teaching universities. It is hoped that this article will gain agreement on the need to revisit the goals of these universities and other higher education institutions insofar as they claim development outcomes, in ways that make clearer what kind of development is understood to be in operation. Central to this must be the rethinking, updating, and clarification of what lies behind the sorts of mission statements identified earlier, and the framing of core activities of recruitment, programme development, and teaching, learning, and student support in explicit ways that support them.

The nature of this work is specific and particular to institution and context. It is hoped that this article will stimulate such further work, and also that such work makes its way back through publication and in turn develops our understanding further. However we might in advance of detailed work at each institution make a proposition that identifies the capabilities that successful students will need in order to exercise freedom as fully as possible. It is suggested that central to the Senian perspective for higher education would be

- the capability to exercise independence of thought in order to build towards autonomy and self-fulfillment,
- the capability to gain a livelihood that aligns as far as possible with the first bullet point,
- the capability to operate as fully and equitably as possible as a citizen.

Distance and E-Learning, Social Justice, and Development : The Relevance of Capability Approaches to the Mission of Open Universities

Tait

It would be possible at institutional level to begin such a review as is proposed here by examining recruitment, programmes of study, and teaching, learning, and student support strategies against these three desired dimensions of human capacity. In such a way we can be more confident that our stated aims of development and social change are integrated with the overall institutional operation and that we can mitigate the risk of institutions operating at a level of rhetoric only.

Acknowledgements

Distance and E-Learning, Social Justice, and Development : The Relevance of Capability Approaches to the Mission of Open Universities

Tait

References

Allama Iqbal Open University. (2013). Retrieved from http://www.aiou.edu.pk/BriefHistory.asp

Athabasca University. (2013). Retrieved from http://www.athabascau.ca/aboutau/index.php

Bowles, S., & Gintis, H. (1976). *Schooling in capitalist America: Education reform and the contradictions of economic life.* New York: Basic Books.

Commonwealth of Learning. (2012). *Three-year plan 2012-15: Learning for development.* Retrieved from http://www.col.org/_layouts/download.aspx?SourceUrl=http://www.col.org/PublicationDocuments/TYP_2012-2015.pdf

Daniel, J. (2001). The UK Open University, managing success and leading change in a mega-university. In C. Latchem & D. Hanna (Eds.), *Leadership for 21st century learning* (pp. 139-146). London : Kogan Page.

Harreveld, R. E. (2010). A capability approach to open and distance learning for in-service teacher education. In P. Danaher & A. Umar (Eds.), *Teacher education through open and distance learning* (pp. 48-60). Vancouver : Commonwealth of Learning.

Haughey, M. (1992). Trends and issues in distance education with implications for northern community development. In D. Wall & M. Owen (Eds.), *Distance education and sustainable community development* (pp. 29-38). Edmonton : Canadian Circumpolar Institute with Athabasca University Press.

IGNOU. (2013). Retrieved from http://www.ignou.ac.in/ignou/aboutignou/profile/2

Kirkpatrick, D. (2008). The challenge of the millenium development goals: Role, potential and impact of open and distance learning. In *Open and distance learning for sustainable development, Proceedings of the second African Council for Distance Education conference* (pp. 25-31). Lagos. Retrieved from http://www.acde-africa.org/sites/default/files/publication.conference_proceedings.pdf

National Open University of Nigeria. (2013). Retrieved from http://www.nou.edu.ng/noun/About%20NOUN/contents/history.html

Nussbaum, M. (2011). *Creating capabilities, the human development approach.* Harvard Belknap.

Distance and E-Learning, Social Justice, and Development : The Relevance of Capability Approaches to the Mission of Open Universities

Tait

Open University. (2013). Retrieved from http://www.open.ac.uk/about/main/the-ou-explained/the-ous-mission

Open University of China. (2013). Retrieved from http://en.crtvu.edu.cn/about/general-information

Open University of Malaysia. (2013). Retrieved from http://www.oum.edu.my/oum/v2/aboutOUM002.html

Open University of Tanzania. (2013). Retreived from http://www.nou.edu.ng/noun/About%20NOUN/contents/history.html

Paul, R. (1990). *Open learning and open management, leadership and integrity in distance education.* London : Kogan Page.

Perraton, H. (2000). *Open and distance learning in the developing world.* London : Routledge.

Perraton, H. (2004). Aims and purpose. In H. Perraton & H. Lentell (Eds.), *Policy for open and distance learning* (pp 9-41). London : RoutledgeFalmer.

Perry, W. (1976). *Open university.* Milton Keynes : Open University Press.

Reza, R. (2004). Benefits for students, labour force, employers and society. In H. Perraton & H. Lentell (Eds.), *Policy for open and distance learning* (pp. 209-223). London : RoutledgeFalmer.

Rogers, A. (1990). *Adults learning for development.* London : Cassell Education with Education for Development.

Rumble, G. (2007). Social justice, economics and distance education. *Open Learning, 22*(2), 167-176.

Saito, M. (2003). Amartya Sen's capability approach to education: A critical exploration. *Journal of Philosophy of Education, 37*(1), 17-33.

Shepherd, J. (2001, Sept 29). English universities still failing poor students, says government watchdog. *The Guardian.* Retrieved from www.guardian.co.uk/education/2011/sep/british-universities-fail-poor-students

Simpson, ? (2010). Does distance education do more harm than good? Retrieved from www.ormondsimpson.com/USERIMAGES/Does%20distance%20education%20do%20harmpdf

Tait, A. (1989). The politics of open learning. *Adult Education, 61*(4).

Distance and E-Learning, Social Justice, and Development : The Relevance of Capability Approaches to the Mission of Open Universities

Tait

Tait, A. (1994). The end of innocence: Critical approaches to open and distance learning. *Open Learning*, *9*(3).

Tait, A. (2008). What are open universities for? *Open Learning*, *23*(2), 85-94.

Tait, A., & O'Rourke, J. (in press). Internationalisation, social justice and open, distance and e-learning: Working with the grain. In T. Anderson & O. Zawacki-Richter (Eds), *Online distance education - Toward a research agenda.* Edmonton : Athabasca University Press.

UNED. (2013). Retrieved from http://portal.uned.es/portal/page?_pageid=93,24305391,93_24305392&_dad=portal&_schema=PORTAL

UNISA. (2013). Retrieved from http://www.unisa.ac.za/Default.asp?Cmd=ViewContent&ContentID=20572&P_XSLFile=unisa/mobi3.xsl

University of Phoenix. (2013). *About University of Phoenix, mission and purpose.* Retrieved from http://www.phoenix.edu/about_us/about_university_of_phoenix/mission_and_purpose.html

UNDP. (2010). *World development report.* New York : Author.

UNESCO. (2002) *Open and distance learning, trends, policy and strategy considerations.* Paris : Author.

Walker, M. (2005). Amartya Sen's capability approach and education. *Educational Action Research*, *13*(1), 103-110.

Walker, M. (2006). Towards a capability-based theory of social justice for education policy-making. *Journal of Education Policy*, *21*(2), 163-185.

Wall, D. (1992). Thoughts on the theory of community and distance education: The significance for maintenance and sustainability of development programs. In D. Wall & M. Owen (Eds.), *Distance education and sustainable community development* (pp. 1-10). Edmonton : Canadian Circumpolar Institute with Athabasca University Press.

Watts, M., & Bridges, D. (2006). *The value of non-participation in higher education. Journal of Education Policy, 21*(3), 267-290.

Wawasan Open University. (2013). Retrieved from http://www.wou.edu.my/aboutWOU.html

Distance and E-Learning, Social Justice, and Development : The Relevance of Capability Approaches to the Mission of Open Universities

Tait

Zaki, W. M. (1997). Allama Iqbal Open University. In I. Mugridge (Ed.), *Founding the open universities, essay in memory of G. Ram Reddy* (pp. 21-52). New Delhi, Sterling Press.

Athabasca University

The Extent of and Reasons for Non Re-Enrollment: A Case of Korea National Open University
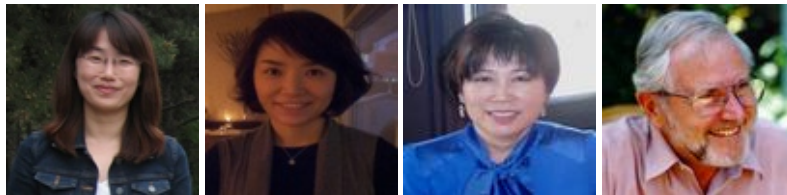
Hyoseon Choi[1], **Yekyung Lee**[2], **Insung Jung**[3], and **Colin Latchem**[4]
[1]Korea National Open University, Korea, Republic of, [2]Sogang University, Korea, Republic of, [3]International Christian University, Japan, [4]Open Learning Consultant, Australia

Abstract

Despite continuous efforts to increase retention, dropout rates are high in distance universities. The objectives of this study were: 1) to investigate the extent and causes of non re-enrollment at a mega university, Korea National Open University; and 2) to suggest actions to improve the retention of students, in general, and those with higher risks of dropout in particular. A survey designed to establish the student demographics and the students' main reasons for non re-enrollment was carried out during spring, 2009 with 1,353 respondents. The results indicate that a lack of feedback from the instructors, heavy workload, and difficulties in studying at a distance were the main reasons for non re-enrollment. The learners' perceptions of the value of the degrees and their ages, gender, and educational backgrounds were also found to be significant factors in decisions not to re-enroll. The suggested solutions for reducing non re-enrollment include: a decrease in the number of required credit hours' study per semester; the provision of stronger social support; the introduction of a more flexible enrollment system; and better use of the available technology and infrastructure to help both students and instructors build stronger learning communities.

Keywords: Causes of dropout; distance learner; dropout; dropout rates; non re-enrollment

Introduction

Maintaining distance learners' enrollments and motivation is always a challenge. Even well-established distance education (DE) institutions report dropout rates of over 50% (Simpson, 2003). For example, the University of Phoenix lost 62% of its first-time full-time bachelor degree students who had enrolled in the fall of 2009 (University of Phoenix, 2012). In Asian DE institutions, student dropout or non re-enrollment rates range from 50% to 80% (Fozdar, Kumar, & Kannan, 2006). At Korea National Open University (KNOU), the dropout rate has been as high as 58% (Hong, Kwon, & Lee, 2004). High dropout or non re-enrollment rates in DE universities give rise to a number of major concerns:

1. It reveals that these universities, which are expressly set up to achieve greater access and equity, are failing to meet the expectations of their students, communities, and their funding bodies.
2. It suggests that there are failings in the quality of the programs and/or support, which diminishes the reputation of DE and leads to doubts about the costs and benefits of this mode.
3. Such attrition means that the cost per graduate, as opposed to the cost per enrollee, is high, thus destroying the argument that DE universities achieve economies of scale. It may also mean lost revenue.
4. Dropout may lead to students having lower self-esteem, being disillusioned with the system, and losing their commitment to learning, all of which can have long-term social and economic repercussions.

Regarding all of these, it is important to acknowledge the extent of, and identify the causes for, dropout in the Asian context, where 10 mega universities and around 100 dedicated DE institutions serve the largest number of distance learners in the world. Understanding these causes can inform remedial actions that can be taken by policy-makers, faculty members, and others involved in the system to assure efficiency and effectiveness in the learning provision. To do this requires a systemic review. However, most studies into non re-enrollment and non-completion (for example, Allen, 1994; Fozdar et al., 2006) have been conducted at the course level, making it difficult to understand the overall extent and reasons for dropout. In this case, the study concerns the extent of, or reasons for, dropout at the institutional level. Specifically, the focus was on the 146,374 Korea National Open University (KNOU) students who, for whatever reason, failed to re-enroll in their studies in the spring of 2009.

The term *dropout* is used to describe those students who do not re-enroll for a program, do not submit assignments, fail to take exams, or withdraw from their studies (Simpson, 2002). The term *stop-out*s refers to students who drop out of programs temporarily with the intention of returning later to their studies. In this study, the term *non re-enrollment* is specifically used to refer to students who had enrolled in a program for at least one semester but then decided not to re-enroll at all.

Specifically, this study was undertaken to find answers to the following questions:

- What is the extent of non re-enrollment among KNOU students?
- What are the predominant reasons for their non re-enrollment?

Literature Review

Factors Explaining DE Persistence

Numerous studies have been undertaken in regard to student persistence. Tinto (1975) proposed that student persistence is a consequence of academic and social integration within the institution, and that it is student interaction with peers and faculty that results in commitment to institutional goals and mores. Kember (1995) drew on Tinto's model to explain student retention in terms of a combination of pre-determined personal characteristics and the processes of academic and social integration. Bean and Metzner (1985) developed a non-traditional student attrition model, highlighting the strong impact of environmental variables on psychological outcomes that led to the intention to leave and finally drop out. They posited that such external variables as personal finances, hours of employment, degree of external encouragement and support, family responsibilities, and opportunities to transfer to other programs or institutions have a greater effect on non-traditional student attrition than the academic-social integration variables.

Recognizing that personal, institutional, and environmental factors are all influential in success or failure in DE, Rovai (2003) synthesized Tinto's and Bean and Metzner's attrition models and developed the composite persistence model (CPM). This model integrates two prior-to-admission factors (student characteristics and student skills) and two sets of after-admission-factors (external and internal factors) to explain the reasons for student persistence in online education programs. Other researchers have drawn on Rovai's model to identify factors influencing dropout at DE institutions. For example, Lee, Choi, and Kim (2012) used this to identify the differences between the characteristics in online students who persist and in those who fail to complete their studies.

Simpson (2006) suggests that institutions should take specific proactive measures to prevent dropout by identifying students at risk at an early stage and then investigating the extent to which certain personal factors and circumstances conjoin to play a part in student dropout. For instance, gender may not be a critical factor for predicting persistence overall, but it could be a significant factor if females perceived a lack of interaction as a barrier to study in large online classes in which frequent social presence and teacher presence were difficult to achieve.

Studies show that not only are personal characteristics, such as resilience (Kemp, 2002), and family and/or workplace responsibilities (Ashby, 2004), associated with persistence, but so are socio-demographic factors such as previous education levels and achievements, gender, age, and occupation (Woodley & Parlett, 1983). Other studies evidence the strong influence of institutional factors. For example, Fozdar et al. (2006) found that the main causes of dropout from a BSc program at the Indira Gandhi National Open University in India were program/course- and support-related rather than personal: study centers being too far from where the students lived, insufficient academic support, and courses and courseware being too difficult for the learners to comprehend. In a US context, Frydenberg (2007) found dropout to be more attributable to course problems or work/learning schedule conflict than students' personal problems in online study. At KNOU, several studies (Hong et al., 2004; Kim, 1985; Kim, Hong, Han, Sung, & Lee, 1994; Park & Park, 1990) have indicated heavy demands at work and unfamiliarity with DE methods and expectations as the two main causes of dropout.

A Proposed Framework for Examining Non-Completion by DE Students

To address the problem of non-completion, a framework for identifying the main factors for non-completion was developed which was based on previous dropout studies. This was an adaptation of Tinto's model (1993), one which makes a distinction between pre-entry and post-entry factors for persistence and dropout. For the purposes of this study, pre-admission student characteristics were categorized into internal and external factors. Internal factors include students' gender, educational background, and age. External factors include marital status, occupation, and perceptions of value of the degree. It should be noted that burdens of workload and/or family demands, another major factor for dropout (Ashby, 2004), are heavily related to the age, gender, marital status, and employment status of the students. Data on the students' skills, such as self-directed learning and time-management skills, were not able to be collected due to administrative limitations.

The post-entry factors or barriers of DE, identified in previous studies and considered in this investigation were: institution related variables, course related variables, socio-economic variables, disposition variables, and circumstantial variables.

- The institution related variables pertain to institutional climate and support which influence the students' motivation and learning (Fozdar et al., 2006; Panda, Raza, Khan, Garg, & Garba, 2004; Shin & Kim, 1999; Tinto, 1975).
- The course related variables include such elements as appropriateness of courses (Rovai, 2003), and quality of teaching (Comfort, Baker, & Cairns, 2002).
- The socio-economic variables refer to such factors as the students' location, socio-economic status, and work and family commitments (Kember, 1995; Morris, Wu, & Finnegan, 2005; Tinto, 1975).

- The disposition variables include elements such as commitment, motivation, and attitude towards study (Bean & Metzner, 1985; Comfort et al., 2002).
- The circumstantial variables are personal/family/job responsibilities, access to technology and other learning support, and social and academic support (Bean & Metzner, 1985; Shin & Kim, 1999).

The overall framework for this study is shown in Figure 1. Barriers of DE are perceived differently based on pre-admissions student factors, and those perceptions lead to re-enrollment decisions.

Student Characteristics   Barriers for DE   Persistence Decision

Student skills

Internal factors

Gender
Educational background
Age

Institutional related
Course related
Socio-economic
related
Disposition related
Circumstantial

Non re-enrollment

Persistence

External factors

Marital status
Occupation
Value of degree
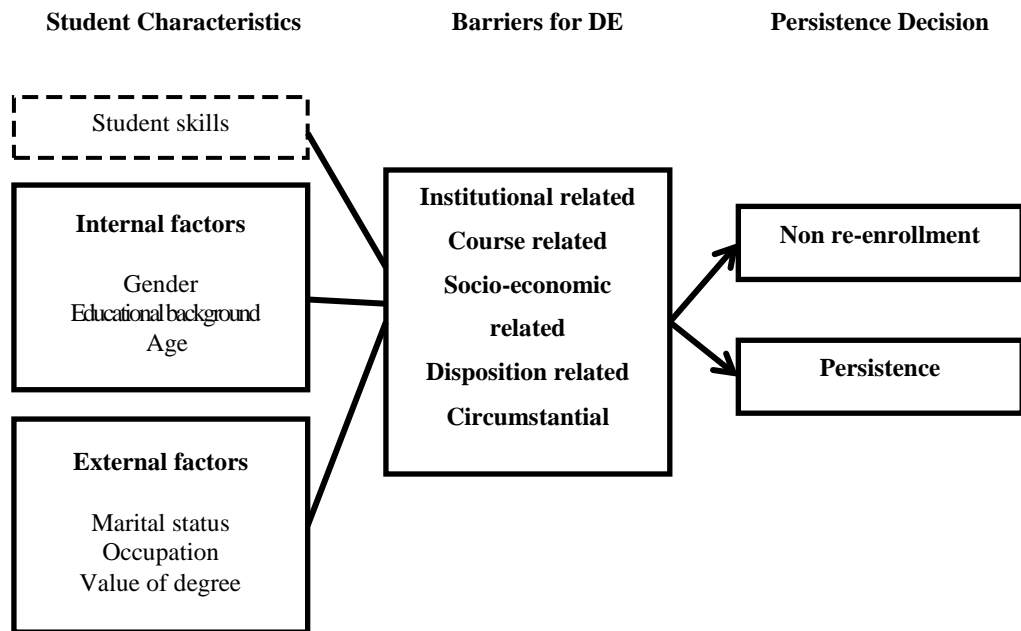
Figure 1. Framework of study into DE persistence and dropout at KNOU.

The Study Context: Korea National Open University

The Korea National Open University (KNOU) was established in 1972. It is the largest distance learning institution in South Korea and the only wholly distance teaching institution in the country. It offers lifelong education to working adults through its undergraduate, graduate, and non-degree programs.

KNOU offers undergraduate degree and non-degree programs across 21 departments in four colleges (Liberal Arts, Social Sciences, Natural Sciences, and Education), and masters level studies through 17 departments. It offers over 800 courses a year and has 148 full-time faculty, 4 visiting professors, 530 full-time administrative staff, over 3,000 part-time lecturers and tutors, and 54 media production specialists.

The main campus is in the South Korean capital, Seoul, and there are 13 regional campuses in the major cities and 32 study centers in the smaller cities. Policy-making, planning, course design and development, and audio, TV, e-learning, and textbook production are all carried out on the main campus. Tutoring services, examinations, and learner support are provided in the regional campuses, and counseling, administration, and student activities are offered in the study centers. To support students' learning, KNOU provides face-to-face regular lecture sessions, travelling teacher systems, and personal tutor systems. Thirty percent of the over 180,000 enrolled students attend optional face-to-face classes or participate in real-time, interactive video conferencing at the regional study centers. Seventy percent of the students depend upon the 59% of courses that take the form of streamed video lectures online plus synchronized PowerPoint slides, the 29% of courses that are broadcast nationally through cable, satellite and IPTV (Internet protocol television) with the studio set up for student questions and feedback, the 11% that are offered in web-based multimedia forms, and the remainder that are audio-based. In all courses, textbooks are still the primary source of content, and there are also other supplementary or optional print or online resources. The KNOU's online system provides a space for uploading exam papers, general Q&A, and class discussions. However, interactive components are generally lacking in these various modes of courses mainly due to a large number of enrollees and a lack of teachers and tutors.

Method

Participants

In order to identify the causes for dropout at KNOU, 146,374 students who had enrolled prior to the spring of 2009 but who then failed to re-enroll in the spring of 2009 (non-enrollees) were invited to participate in an online survey conducted between 13-17 April, 2009. After the initial survey request, three more reminders were sent to the students to try to maximize the response rates. In the event, 1,353 students responded. Table 1 details the demographics of these respondents. These data were found to be comparable with the demographics of previous KNOU dropout studies. The majority of the respondents were in their 30s or 40s. About half were female and around two-thirds were married. One-third of respondents were high school graduates and most of them were in employment.

Table 1

Demographics of Respondents

Items		Respondents	
		Frequency (N)	Percentage (%)
Age group	21 - 30	140	10.3
	31 – 40	646	47.7
	41 – 50	372	27.5
	51 – 60	167	12.3
	Over 60	28	2.1
	Total	1,353	100
Gender	Male	619	45.8
	Female	734	54.2
	Total	1353	100.0
Marital Status	Married	915	67.6
	Single	406	30.0
	Separated	32	2.4
	Total	1,353	100.0
Educational background	High school graduate	431	31.9
	Matriculation	82	6.1
	College graduate	392	29.0
	University Graduate	309	22.8
	Postgraduate	122	9.0
	Other	17	1.3
	Total	1,353	100.0
Employment status	Full-time	866	64.0
	Part-time	71	5.2
	Unemployed/looking for work	68	5.0
	Unemployed/not looking work	94	6.9
	Other	254	18.8
	Total	1,353	100.0
Decision on non re-enrollment	I plan to resume my studies at some time in the future	718	53.1
	I no longer plan to undertake any studies	184	13.6
	I am not sure	451	33.3
	Total	1,353	100
Value of degree	I felt I no longer needed the degree	117	8.6
	I felt the degree had little value in the market	144	10.6
	I felt I could get where I wanted without the degree	180	13.3

Survey Instrument

The online survey was developed to identify the reasons given by the respondents for not re-enrolling. The survey was reviewed and revised by two DE research professionals, and completed with the help of feedback from two graduate students.

The final survey comprised 14 questions regarding personal demographics, the original reasons for enrolling in the programs, students' perceptions of the value of the degrees in terms of their careers, the students' future plans and their previous experience with

DE, plus 21 questions regarding their reasons for non-enrollment. Following the conceptual framework presented in Figure 1, the survey questions were designed to elicit answers on the institution-related, course-related, socio-economic, disposition-related, circumstantial, and emotional reasons for not re-enrolling. The students were asked to respond by choosing one of 'yes', 'no', or 'not sure' as their reasons.

Procedure

The URL address of the questionnaire and details of the objectives and participation methods were emailed to the target group. To gain assent, the email included a paragraph stating "If you agree to participate in this survey, insert your email address in the blank box and click the 'Continue' button."

Data Analysis

Descriptive data was analyzed to identify demographic characteristics and predominant reasons for non re-enrollment. Confirmatory factor analysis (CFA) was used to confirm the theoretical model (Figure 1) of this study. Structural equation modeling (SEM) was used in order to identify relationships among the variables of the model that contribute to non re-enrollment. In order to identify the most dominant factors within the framework, survey items to which students predominantly answered yes as their reasons for non re-enrollment were analyzed through frequency analysis. For analysis, the answers *yes* or *no* were coded as 1 and 0. And the learners' plans to continue or stop their study were coded as 1 for *resume studying* and 2 for *dropout.*

Results

Extent of Non Re-Enrollment

Table 2 shows the numbers of registered, formally enrolled, and non re-enrolled students ratios between 2007 and 2011. Despite a slight decrease in non-enrollment rates between 2007 and 2011, there seems to be no noticeable improvement in overall enrollment.

Table 2

Non-Enrollment Rates at KNOU between 2007 and 2011

Year	Registered (c)	Enrollments	Non-enrollments (d)	Non-enrollment ratio (d/c×100: %)
2007	596,967	311,632	285,335	47.80
2008	599,693	311,074	288,619	48.13
2009	608,658	344,562	264,096	43.39
2010	632,545	362,576	269,969	42.68
2011	614,262	335,753	273,061	44.45

Table 3 shows the total enrollment across all KNOU courses, the number and ratio of non-examinees, and the number and ratio of non-completion students between 2007 and 2011. These show no decrease in non-completion rates during this period, despite increased provision of learner support.

Table 3

Course Non-Completion Rate: 2007 to 2011

Year	Total enrollments across all courses (a)	Midterm paper			Final exam			Non-completion	
		Examinees	Non-examinees (b)	Non-examinees ratio (b/a×100: %)	Examinees	Non-examinees (c)	Non-examinees ratio (c/a×100: %)	Non-completion (d)	Ratio (d/a×100: %)
2007	1,704,881	1,409,284	286,037	16.78	1,325,529	369,792	21.69	378,338	22.19
2008	1,703,029	1,402,203	291,317	17.11	1,318,146	375,374	22.04	382,063	22.43
2009	1,640,347	1,397,504	242,843	14.80	1,307,894	332,453	20.27	357,819	21.81
2010	1,688,821	1,417,823	270,998	16.05	1,317,325	371,496	22.00	357,453	21.17
2011	1,634,359	1,336,488	297,871	18.23	1,273,048	361,311	22.11	301,982	18.48

Reasons for Non Re-Enrollment

Confirmatory factor analysis (CFA) was carried out as the first step of analysis. CFA results indicate five factors for explaining non re-enrollment as in Table 4. Frequency statistics for the perceived reasons of non-enrollment indicated that three items, "because of a lack of feedback on my work", "because the workload was too heavy in my workplace", and "because it is difficult to study at a distance", were identified as variables displaying significantly different ratios between responses, with the majority

answering yes. Overall, the students perceived institution-related variables to be stronger reasons for non re-enrollment; emotion-related variables seemed to have had little impact on their decisions. Unlike the hypothesized model of barriers for distance education, the fifth factor turned out to be emotional-related variables such as "feeling isolated " and "feeling depressed", rather than environmental variables.

Table 4

Reasons for Non Re-Enrollment

Variables	Reasons	Frequency (%)		
		Yes	No	Not Sure
Institution related variable	Because of a lack of feedback on my work	**61.7**	34.3	4
	Because of a lack of contact with other students	47.1	48.3	4.6
	Because of a lack of online help and support	46.6	47.2	6.2
	Because of a lack of face-to-face teaching and advice	45.9	49.2	5
	Because it is difficult to study at a distance	**56.6**	39.5	4
	Because I lacked computer/ Internet access	12	83.9	4
Course related variables	Because the course was different from what I expected	45.9	48.9	5.2
	Because the course was not practical enough	28.3	65.7	6
	Because the course I wanted was cancelled	10.2	87.6	2.2
	Because another course/ program was better suited to my needs	32.4	62.8	4.9
	Because the course information was inadequate/misleading	25.1	68.1	6.8
Socio-economic variables	Because of family demands	35	62.4	2.6
	Because the workload was too heavy at job place	**64.3**	32.9	2.8
	Because of the costs	16.4	81.1	2.5
	Because of disability/illness	5.6	92.6	1.8
Disposition related variables	Because the course was too difficult	37.2	56.3	6.5
	Because of pressures of work	31.9	63.8	4.3
	Because I lacked the necessary knowledge and skills	48.4	46.8	4.8
	Because I lacked the motivation	42.8	53	4.2
Emotion related variables	Because I felt isolated	15.7	81.1	3.3
	Because I felt depressed	8.9	87.1	3.9
Total		31.6	63.9	4.4

Validation of Framework for Explaining Non Re-Enrollment

The model that had been developed to establish the relationships between the personal factors and barriers found to be powerful in explaining non re-enrollment at KNOU are shown in Figure 2. The goodness-of-fit indexes for the proposed model for explaining

non re-enrollment were CFI = .915, TLI = .975, and REMSEA = .075, indicating good fit of the model (Byrne, 2001).
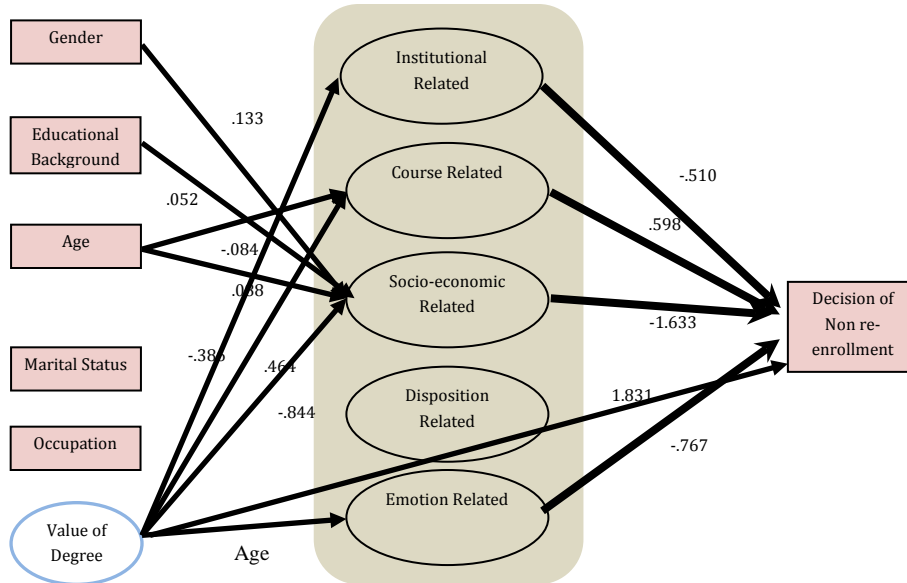

Figure 2. Non re-enrollment model.

The key finding derived from SEM was that learner's perceptions of the value of the degree had a significant influence on the institutional related, course related, socio-economic related, and emotion related barriers. Those learners who considered the degree to be useful to their careers showed stronger tendencies to re-enroll. However, the more they value the degree, the more the course related barriers may become a stronger obstacle, while the institution, socio-economic, and emotion related barriers are less likely to be regarded as obstacles. Secondly, it was revealed that age has a statistically significant influence on non re-enrollment mediated with course related and socio-economic related barriers. The older the student, the less influence on course related and socio-economic related barriers. Finally, gender, educational background, and age affect non re-enrollment mediated by the socio-economic related variable. Females tend to re-enroll more than male by socio-economic related variable. And the higher the level of educational backgrounds, the fewer the dropouts mediated by the socio-economic related variable.

Discussion

Recognizing that learner support is the key to successful distance learning, KNOU has devised various ways of supporting its students, such as offering educational content in a variety of media formats (printed materials, MP3 files of all broadcast programs, CD-ROMS, and online courses), face-to-face lectures, and personalized tutoring. Despite all

of these support systems, the current study reveals that KNOU students are still struggling with and discontinuing their studies in considerable numbers. The main reasons for this are shown to be the heavy workloads demanded in their jobs, the lack of feedback on the students' work, and a dislike of distance learning per se. Over 64% of the respondents cited heavy workload as a main reason for their decision not to re-enroll, indicating that they had great difficulty in finding time for their studies. It should be explained that KNOU students are required to enroll in five to six courses every semester. Consequently, many students focus on a limited number of courses and intentionally fail the remainder in the semester (Shin & Kim, 2009). There is clearly a need to address this issue and provide a system which allows students to enroll in whatever number of courses they feel they can handle in a particular semester.

Around 62% of the respondents reported that they felt they had received insufficient feedback on their academic work. The quality and extent of feedback is well known to be an important aspect of learning, particularly in DE settings. However, it has been calculated that with 750,000 to 950,000 enrollees annually, and the current limits to the number of faculty and part-time tutors, providing more, and more detailed, feedback on all assignments to each and every student would necessitate a two-month turnaround. Hiring sufficient staff to reduce this time would exceed KNOU's financial capabilities, so, currently, this problem would appear to be intractable. However, KNOU has met with some success in encouraging and supporting informal self-help groups among its students. Students participating in such self-study groups have been shown to be more confident and successful in their studies (Park & Kim, 2011). This suggests that the university should consider how it might make further use of face-to-face and online social interaction among students in order to increase their motivation and persistence in their studies.

Around 57% of the respondents indicated that they disliked studying at a distance. This indicates the importance of helping new students to appreciate what is involved in DE study and to develop the necessary competencies in distance learning before they actually embark on their formal studies.

Analysis of the effect of gender, educational background, age, and students' perceptions of the value of the degree provided further insights into the reasons for non re-enrollment. It would appear that while at the outset women students see DE as providing a solution to balancing family and study commitments, socio-economic barriers such as family responsibilities and the demands of employment are a greater hindrance to female students than their male counterparts. This suggests a need for KNOU staff to put more effort into supporting female students, for example, by developing specific online systems to encourage and support female networking and study groups.

Students' education level prior to entering KNOU is also shown to have an impact on how these students perceive the barriers in online learning. As seen in Table 3, a

considerable number of students failed to submit their mid-term papers. This can be explained by the fact that about 50% of the new students are high school graduates who often lack the academic writing skills required for university work (Korea National Open University, 2007). But SEM results suggest that although these students may experience greater difficulties academically, students with higher educational levels and age are more susceptible to socio-economic barriers when deciding to re-enroll. These findings indicate the need for different approaches such as group tutoring systems for learners with different educational backgrounds and of different ages.

Conclusion

Overall, it may be concluded from these findings that the KNOU system still lacks an integrated, effective, and efficient learner support system that is capable of identifying the learners' prior learning and learning capacities, responding to these factors, and ensuring pathways to successful learning and a reduction in non re-enrollment. Based on these findings, the researchers propose that KNOU should:

Develop an institution-wide system that will encourage and support increasingly independent study while maintaining social support and promoting interactions and exchanges of ideas with professors, tutors, and peers. This can be achieved by organizing:

- Pre-enrollment courses – preferably combining online and face-to-face modes – to help new students develop the knowledge, skills, and attitudes needed to study successfully at distance.
- Remedial courses for students lacking the necessary study skills and course-related prior knowledge and writing skills.
- Personalized tutoring services for all new students. These services would need to take every advantage of online technologies including mobiles and tablets. Tutoring services should also be offered to specific student groups such as female students with less formal schooling and others at risk in response to their clearly identified needs.

Construct learning environments that support peer-based learning and create a sense of belonging by actively promoting real and virtual voluntary study groups. This could be achieved by:

- Encouraging and supporting out-of-class and/or online informal learning groups wherein students share their concerns and experiences and learn from and empower each other.
- Encouraging the use of social media tools (blogs, wikis, etc.) by both instructors and students. However, alternative methods such as offline meetings should

also be provided for those students who are unfamiliar or uncomfortable with the social media or do not have access to the tools.

- Providing online/mobile tools, such as mobile applications, to support peer-based learning and encouragement.
- Using constant RSS feeds to send new information and updates to keep students current with course activities.

Review the existing DE system and its impacts on learning processes, learning achievement, learner satisfaction, enrollment and course completion, cost-effectiveness, and efficiency. For example:

- Reduce the number of courses students must take each semester. This would both reduce the burden on the students, and make it more feasible for faculty members to offer more personalized tutoring services and more frequent feedback.
- Change the student evaluation system from that of a "one-shot examination" which mostly involves information recall to a series of formative exams, tests, or assignments which have clearer guidelines and built-in support and will help to initiate the learners into the new forms and requirements of study without placing further undue burdens on faculty and tutors.
- Make the enrollment system more flexible so that the students can enroll in courses according to their preferred learning pace.

This study was undertaken to contribute to the existing literature on student retention at DE institutions by presenting an overall picture of the extent and major reasons for non re-enrollment at KNOU, and to suggest solutions targeted at specific student groups. While this model was designed and applied at only one institution, by focusing on the relationship between learners' personal factors and perceived barriers for DE, this study may go some way towards suggesting how to create practical support systems that fit the different needs of various student groups in any distance education provider. However, the small number of student variables investigated and the lack of further analysis and comparison of effect sizes make it difficult to propose a coherent strategic plan for increasing retention that is guaranteed to succeed at KNOU or elsewhere. Future research therefore is needed to identify reliably effective systems and methods for retaining students. This might be done by 1) exploring retention at an institution level at various online universities in order to gain a holistic picture of student attrition; 2) examining conflicts, issues, and the consequences of implementing strategies targeting different needs of students; and 3) proposing general guidelines for motivating students to continue their studies.

Acknowledgements

References

Allen, B. (1994). The student in higher education: Nontraditional student retention. *CATALYST, 23*(3), 19-22.

Ashby, A. (2004). Monitoring student retention in the Open University: Definition, measurement, interpretation and action. *Open Learning, 19*(1), 65-78.

Bean, J. P., & Metzner, B. S. (1985). A conceptual model of nontraditional undergraduate student attrition. *Review of Educational Research, 55*(4), 485-540.

Byrne, B. M. (2001). *Structural equation modeling with Amos: Basic concepts, applications, and programming*. Mahwah, NJ: Lawrence Erlbaum.

Comfort, H., Baker, P., & Cairns, L. (2002). *A qualitative study investigating factors which help and hinder learner progression FE to HE: Report on the "Transitions Project"*. Leicester: Leicester College.

Fozdar, B., Kumar, L., & Kannan, S. (2006). Study of the factors responsible for the dropouts from the BSc programme of Indira Gandhi National Open University. *The International Review of Research in Open and Distance Learning, 7*(3). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/291/747

Frydenberg, J. (2007). Persistence in university continuing education online classes. *The International Review of Research in Open and Distance Learning, 8*(3). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/375/934

Hong, S. J., Kwon, J. H., & Lee, M. W. (2004). *Learning supporting program and its managing methods for the prevention of learning discontinuance in the first semester*. Seoul: Korea National Open University.

Kember, D. (1995). *Open learning courses for adults: A model of student progress.* Englewood Cliffs, NJ: Educational Technology.

Kemp, W. (2002). Persistence of adult learners in distance education. *The American Journal of Distance Education, 16*(2), 65-81.

Kim, H. S., Hong, Y. N., Han, K. Y., Sung, K. S., & Lee, J. S. (1994). *Studies on causes of non-enrollment in KNOU*. Seoul: Korea National Open University.

Kim, P. Y. (1985). *Factors on learning motivation and persistence: Preventions of dropout and improvement of learning outcomes.* Seoul: Korea National Open University.

Korea National Open University (2007). *2007 enrollment statistics*. Seoul: Author.

Lee, Y., Choi, J., & Kim, T. (2012). Discriminating factors between completers of and dropouts from online learning courses. *British Journal of Educational Technology, 4*(2), 329-337.

Morris, L., Wu, S., & Finnegan, C. (2005). Predicting retention in online general education courses. *The American Journal of Distance Education, 19*(1), 23-36.

Panda, S., Raza, R., Khan, A. R., Garg, S., & Gaba, A. (2004). *Study on programme completion, and learner persistence and dropout in distance education.* Indira Gandhi National Open University and International Research Foundation for Open Learning, UK.

Park, J., & Kim, M. (2011). *The current state and effects of out-of-class learning activities at KNOU.* Seoul: Korea National Open University.

Park, D. J., & Park, J. W. (1990). *Employed students' life and learning problems.* Seoul: Korea National Open University.

Rovai, A. P. (2003). In search of higher persistence rates in distance education online programs. *Internet and Higher Education, 6*(1), 1-16.

Shin, C. H., & Kim, J. (2009). *Needs survey for improving quality of teaching and learning.* Seoul: Korea National Open University.

Shin, N., & Kim, J. (1999). An exploration of learner progress and dropout in Korea National Open University. *Distance Education-An International Journal, 20*(1), 81-95.

Simpson, O. (2002). *Supporting students in online, open and distance learning.* London: Routledge.

Simpson, O. (2003). *Student retention in online, open and distance learning.* London: Routledge.

Simpson, O. (2006). Predicting student success in open and distance learning. *Open Learning, 21*(2), 125-138.

Tinto, V. (1975). Dropouts from higher education: A theoretical synthesis of the recent literature. *A Review of Educational Research, 45*, 89-125.

Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition* (2nd ed.). Chicago: University of Chicago Press.

University of Phoenix (2012). *Consumer information guide 2011-2012.* Retrieved from http://cdn.assets-phoenix.net

Woodley, A., & Parlett, M. (1983). Student dropout. *Teaching at a Distance, 24*(1), 2-23.

Athabasca University

The Adoption of Open Educational Resources by One Community College Math Department
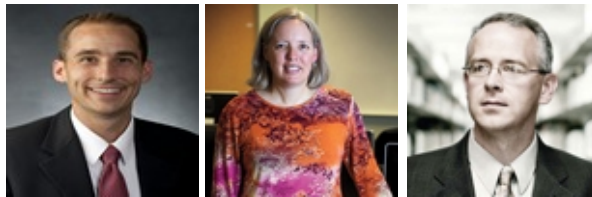
John Levi Hilton III[1], Donna Gaudet[2], Phil Clark[2] (not shown), Jared Robinson[1] (not shown), and David Wiley[1]
[1]Brigham Young University, USA, [2]Scottsdale Community College

Abstract

The high cost of textbooks is of concern not only to college students but also to society as a whole. Open textbooks promise the same educational benefits as traditional textbooks; however, their efficacy remains largely untested. We report on one community college's adoption of a collection of open resources across five different mathematics classes. During the 2012 fall semester, 2,043 students in five different courses used these open access resources. We present a comparison between the previous two years in terms of the number of students who withdrew from the courses and the number that completed the courses with a C grade or better. Our analysis suggests that while there was likely no change in these educational outcomes, students who have access to open access materials collectively saved a significant amount of money. Students and faculty were surveyed as to their perceptions of these materials and the results were generally favorable.

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

Introduction

Wiley and Green (2012) state that "College students spend an average of $900 per year on textbooks—26 percent of the cost of tuition at a public, four-year university" (p. 83). This percentage is sometimes even higher at community colleges where tuition and fees are traditionally lower than at universities. Paying for expensive textbooks seems particularly questionable in introductory courses, in which the information being presented is largely stable and the knowledge is readily available. Textbooks are only part of a larger issue, namely that many students struggle to pay for higher education in general and textbooks specifically (Allen, 2011). According to Perry (2012),

> The 812% increase in the price of college textbooks since 1978 makes the run-up in house prices and housing bubble (and subsequent crash) in the 2000s seem rather inconsequential, and the nine-fold increase in textbook prices also dwarfs the increase in the cost of medical services over the last three decades. Compared to the 250% increase in the Consumer Price Index (CPI) over the last 34 years, college textbooks have risen more than three times the amount of the average increase for all goods and services.

Martin and Lehren (2012) report that in the United States alone, outstanding student loans (part of which funds are used for purchasing textbooks) now total over one trillion dollars. Although textbooks are not the exclusive reason for this debt, Buczynski (2007) argues that particularly for community college students, textbook prices can be a significant part of their overall college expenses.

Hilton and Wiley (2011) suggest that using open textbooks can provide substantial cost savings to students without compromising educational efficacy. Open textbooks are similar to traditional textbooks in terms of content; however, they are generally available for free in digital format, along with low-cost print copies. Such textbooks are classified as being a subset of open educational resources (OER). OER have the advantage of being freely available online and have Creative Commons licenses that (among other things) allow for them to be reused for free in a variety of contexts (Bissell, 2009; D'Antoni, 2009; Downes, 2007). Bliss (2013) writes that

> numerous projects have been undertaken to develop OER, including the creation of OpenCourseWare at MIT and several other universities (see http://www.ocwconsortium.org), education modules like those available by Connexions (see http://cnx.org), openly available textbooks such as those offered by CK–12 or the Saylor Foundation (see http://ck12.org; http://www.saylor.org), openly available classes (Fini, et

al., 2008), and [some versions of] Massively Open Online Courses (MOOC) (Mackness, et al., 2010; Fini, 2009).

While little research has been done regarding student perceptions of OER, Lindshield and Adhikari (2013) report that students enjoy using open textbooks.

Because this is a relatively recent phenomenon, little research has been undertaken to assess how utilizing OER impacts student learning. Hilton and Laman (2012) reported on Houston Community College's adoption of an open textbook for a psychology class. During the fall semester of 2011, 690 students used this open textbook. They stated that "Compared with students using a traditional text in the spring of 2011, students who used the free online textbook scored higher on departmental final examinations, had higher grade point averages in the class and had higher retention rates" (p. 265). In the context of a university, Feldstein et al. (2012) found that students in business courses that utilized OER were more likely to use the learning materials, and found that these courses appeared to have lower withdrawal rates and higher grades than those in classes without open materials. Similarly, Wiley et al. (2012) found that a high school district in Utah, USA that used open textbooks for its science curriculum saw essentially no change in their state standardized test scores. In the present study, we add to the body of knowledge surrounding the impact of using open educational resources in a community college setting by reporting on Scottsdale Community College's adoption of open course materials across five different math courses.

Context of the Study

This study took place at Scottsdale Community College (SCC), a community college in Arizona, USA with approximately 10,000 students. Males comprise 54% of its student body, and 46% are female;76% of its students are Caucasian, 11% Hispanic, 5% Native American, 4% African American, and 4% Asian/Pacific Islander. Like many who attend college in the United States, some students at SCC have difficulty paying for the cost of education. Our survey of 966 mathematics students determined that slightly less than half of these students (451) used some combination of loans, grants, and tuition waivers to pay for the cost of their education. The difficulties of paying for college may prevent some students from purchasing textbooks, potentially limiting their educational growth, potentially limiting their access to information and knowledge.

The mathematics faculty at SCC viewed the shift to open materials as one that could provide greater access to learning resources at a lower price, without compromising student learning. The decision to adopt open materials evolved over a period of several years with different instructors in the Mathematics department taking different approaches. In the spring of 2012, department members collectively created a cohesive strategy for using open educational resources. Previously open materials had been used in only a few classes. However, in the fall of 2012 OER was employed throughout five different courses at SCC. That semester, all of the materials requested by the five

different math courses were available online for free; in some cases, hard copies of textbooks were made available for optional purchase at prices ranging from $13.00 to $30.00. We next list the courses that utilized open materials and describe the open materials that were employed.

Introductory Algebra Math 09x.

Three primary OER were employed in this class. First there was a student workbook, written by SCC faculty members. Because many of the instructors at SCC do hands-on work with groups and white-board work in class, they wanted materials that would support this approach. They created a workbook that contains examples (which students complete by watching videos), practice problems, and end-of-lesson assessments. The SCC faculty published this workbook using a Creative Commons license. Second, they used the Internet Mathematics Assessment System, "a web-based math assessment tool for delivery and automatic grading of math homework and tests" (Lippman, n.d.). This open source software is licensed under the GNU Public License. Finally an OER textbook, *CK12 Introductory Algebra* (Gloag, Gloag, and Kramer), was used primarily as an online resource; few instructors required the book, relying instead on the video modules that were part of the workbooks.

Intermediate Algebra Math 12x.

Materials similar to those used in Math 09x (albeit at a higher level) were available for Math 12x. The textbook in this class was *CK12 Intermediate Algebra* (Gloag, Gloag, Kramer, and Landers).

College Algebra Math 15x.

As with the Math 09x and Math 12x courses, Math 15x utilized a student workbook created by SCC faculty members using a Creative Commons license and the Internet Mathematics Assessment System. It also used online lessons created in Softchalk (www.softchalk.com) that introduces the material to students. These lessons include text, videos, applets, images, and comprehension questions that the students answer and get a score at the end. Unlike the other resources they employed, Softchalk is not open source. Finally, a combination of two textbooks, *Precalculus* by Lippman and Rasmuessan and *Precalculus* by Stitz and Zeager, was used. SCC took advantage of the remixability of OER to combine these two open textbooks into one in order to ensure that the final version covered all of the competencies required by Maricopa Community Colleges, of which SCC is one. This type of remix is more fully described by Hilton, Wiley, Stein, and Johnson (2010). In addition, we note that SCC took advantage of the CC-license to make small textbook revisions in order to ensure that the content matched the local requirements.

Trigonometry MAT182.

This course utilized a portion of the book *Precalculus* by Lippman and Rasmuessan, along with the Internet Mathematics Assessment System.

PreCalculus MAT187.

The resources utilized in this class were similar to those employed in MAT15x. SCC's precalculus course is a combination of college algebra and trigonometry; the college algebra portion is the same as what is taught in Math 150. However, Softchalk lessons were not used in this course.

Research Questions and Method

In this study we had three key research questions.

1. How much money did students save because of the use of open textbooks?
2. Did the patterns of retention and student success change after OER was implemented?
3. How did students and faculty perceive OER quality, compared to other materials?

In the fall of 2012, 2,043 students taking 65 sections of math classes used the open materials. Forty-two different instructors were involved; 643 students were enrolled in MAT09x, 764 in MAT12x, 461 in MAT15x, 95 students in MAT182, and 80 students in MAT187. Ninety-three of these students were enrolled in distance versions of the respective courses. In order to investigate whether these materials influenced (positively or negatively) student learning outcomes we examined institutional data reported by SCC on withdrawal rates and those completing the course with a C grade or better. These data are publicly available. We also surveyed both students and faculty as to their experiences with the open materials. These surveys were based on the work done by Bliss, et. al (2013), and were administered during class; 966 students completed the survey (this number excludes a small number [approximately 3%] of surveys that were discarded because the students evidently randomly bubbled in responses as evidenced by their out-of-bounds responses).

Results

Textbook Costs

SCC faculty members who were surveyed as to the costs of the textbooks they typically have required in the past reported that the average cost of these textbooks was $125. Some courses ranged as high as $220. As stated above all of the materials necessary for the five different math courses included in this study were available online for free; in some instances hard copies of textbooks were also made available for optional purchase at prices ranging from $13.00 to $30.00. If we assume that all 2,043 students would have purchased a $125.00 textbook, and instead used the openly licensed, free online materials, the resulting savings would be $255,375.00. Clearly not every student would have purchased a new textbook, and some students may have opted to purchase a printed copy of the open materials, but this figure does indicate the significant cost savings to students that can result from a single semester's adoption of OER.

Grades and Completion Rates

Our second research question asked if there were any changes in student success patterns or completion rates in the fall of 2012, the semester in which open educational resources were used. Student success patterns were measured by the rate at which students passed the math class with a C grade or better. The results for the fall semesters during years 2010 to 2012 are shown in Table 1 (we only compared fall numbers given that the student population in the courses shifts substantially between fall and spring semesters).

Table 1

Aggregated Data Fall 2010 – Fall 2012: Overall Grades

Percentage of students earning a C grade or better	Fall 2010	Fall 2011	Fall 2012
MAT 09x	62% (790)	67% (704)	51% (643)
MAT 12x	60% (748)	63% (721)	62% (764)
MAT 15x	65% (448)	64% (388)	65% (461)
MAT 182	56% (106)	61% (109)	58% (95)
MAT 187	53% (72)	48% (82)	55% (80)

In order to examine whether the distribution of student success differed significantly from 2011 to 2012, we conducted a z-test for comparing proportions for each course. The results of these z-tests revealed no significant change in student success rates from 2011 to 2012, with one notable exception: The percentage of student success in Math 09X declined significantly to 51% in 2012 compared to percentages of 67% and 62% in

the prior two years. This result was significant at the $\alpha = .05$ level, $z = -5.97, p < .001$. Possible reasons for this change are included in the discussion section. Otherwise, it does not appear that student success rates significantly varied from the same rate in 2011.

A similar pattern was observed when examining the data for course completion rates in 2012 compared to previous years. The 2012 completion rate in Math 09X was significantly lower than the completion rate in the previous year, $z = -6.11, p < .001$. Again, possible explanations for this change will be subsequently discussed. There did not appear to be a drop in completion rate in other courses in the year that OER were adopted. Table 2 summarizes completion rates for the classes that were the focus of this study.

Table 2

Aggregated Data Fall 2010 – Fall 2012: Completion Rates

Completion rates	Fall 2010	Fall 2011	Fall 2012
MAT 09x	75% (790)	79% (704)	64% (643)
MAT 12x	79% (748)	76% (721)	75% (764)
MAT 15x	73% (448)	72% (388)	76% (461)
MAT 182	58% (106)	72% (109)	72% (95)
MAT 187	68% (72)	62% (82)	64% (80)

Student Perceptions of the Materials

Our third research question asked how students and faculty at SCC perceived the quality and content of the new OER. We surveyed students to learn of their perceptions of the OER used in their classes. Students were generally positive about the materials. In total, 83% either strongly agreed or slightly agreed with the statement, "Overall, the materials adequately supported the work I did in class." Figure 1 more specifically illustrates their responses to this statement.
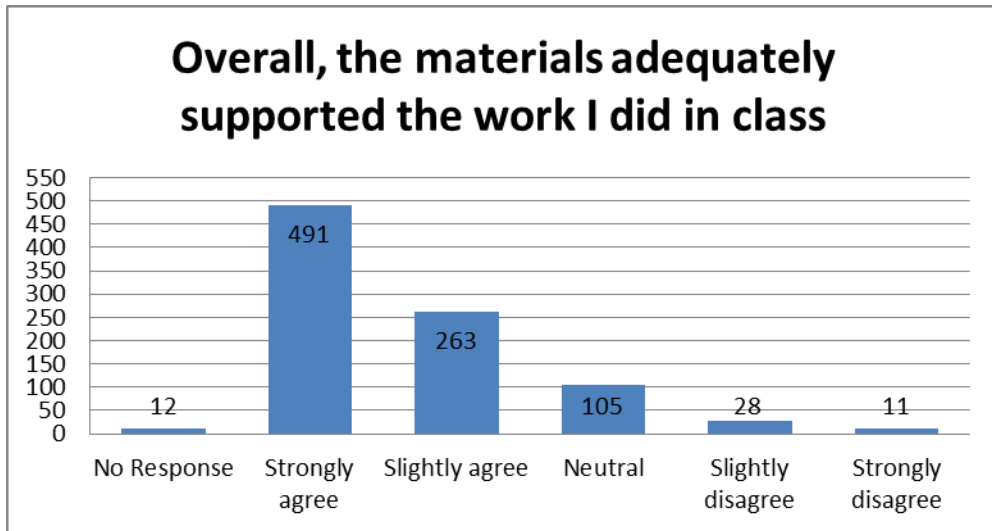
Figure 1. Student responses to the statement, "Overall, the materials adequately supported the work I did in class."

Similarly, students tended to agree with the statement, "Overall, the materials adequately supported the work I did outside of class," as outlined in Figure 2.
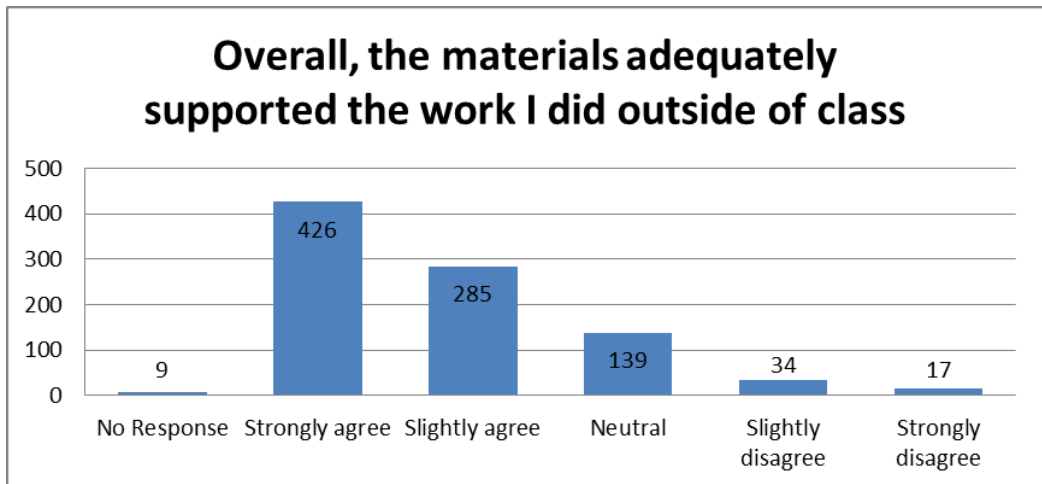

Figure 2. Student responses to the statement, "Overall, the materials adequately supported the work I did outside of class."

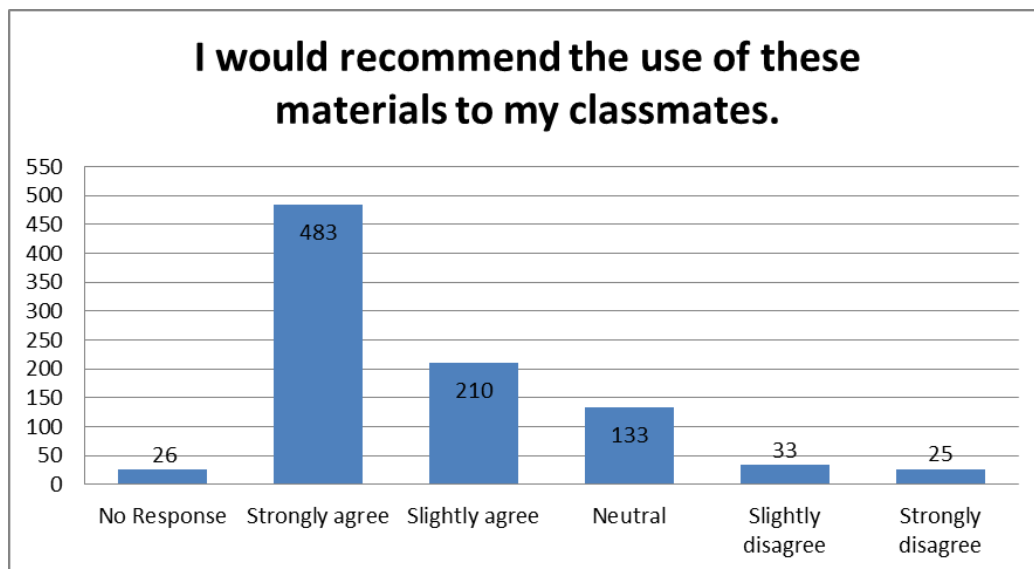Students also provided an overall endorsement of the open materials as evidenced by Figure 3.

Figure 3. Student responses to the statement, "I would recommend the use of these materials to my classmates."

The student survey also included free-response questions. Their answers to these questions were again generally positive. For example, of the 255 responses to the question, "What additional comments do you have regarding the quality of the open materials used in your class?" 210 (82%) were positive. Representative comments include the following statements: "Great!" "They were good. Definitely worth not having a massed produced book for." "I never had an open materials class before. It made work less stressful and learning more enjoyable – didn't constantly feel frustrated and was able to look through notes when I got stuck." "The quality was excellent. It really helped my understanding."

Several of the answers to this question focused on the price of the materials such as the following: "Keep them, buying textbooks is out of date and I think materials should be inexpensive." "I love saving money, I am poor." "I like the open materials, textbooks are so expensive that it makes me not want to buy them."

Of the student comments not coded as positive, representative statements included the following: "That was fine but you need better material," or "Fine. I used Youtube a lot to get help and other math websites."

Faculty Perceptions of the Materials

Twenty faculty members at SCC completed our survey (response rate of 48%) regarding their opinions on the OER that they had employed. In general they viewed the open materials positively. In response to the question, "How would you rate the quality of the OER textbook used for this course?" three instructors rated the book as "WORSE than

the quality of texts in my other courses"; nine instructors said they were "About the SAME AS the quality of texts in my other courses"; and six reported that they were "BETTER than the quality of texts in my other courses" (two faculty members left this question blank).

Of the 15 instructors who responded to the question, "Do you feel that the OER materials adequately supported the work that was completed INSIDE the classroom? Why or why not?" 13 answered "yes," and then provided an explanatory comment. The following are two examples of these answers: "Yes, although I will rearrange some of the material next time around. For example, I like to cover properties of exponents BEFORE exponential and logarithmic functions as we use these properties at that time in my class" and "Yes, it is a complete resource." The two responses that did not begin with a "yes" are as follows: "Need more specific examples" and "Most of the time it was supported."

Similarly, of the 15 instructors who responded to the question, "Do you feel that the OER materials adequately supported the work that was completed OUTSIDE the classroom? Why or why not?" 13 answered "yes." Sample responses are "Yes. These materials provided the students useful resources" and "Yes. It focused in the lesson well." The remaining two responses were "Mostly – often students had online questions, which were discussed through MathAS or in class" and "In Math 12x, the online HW contained questions that were not written in the style of the workbook questions. Some students had difficulty in transferring their skills to the online questions."

Discussion and Limitations

Our first research question pertained to the amount of money students saved as a result of the open textbooks. As we reported above, if all 2,043 students would have purchased a $125.00 textbook, and instead used the openly licensed, free online materials, the total savings would have been $255,375.00. Because we did not directly measure the amount of money students spent purchasing textbooks during the years 2010-2012, we cannot ultimately determine what the exact cost savings were. However, even if only half the students would have purchased the traditional textbooks, the savings experienced by the students at one community college in one semester would still have eclipsed $100,000.00.

To answer our second research question, we examined the rates of student success and course completion in the year of OER adoption compared to the previous two years. Although this case study prohibits any causal attribution to observed change or lack of change in this data, the patterns might provide rationale and direction for future research.

With the exception of Math 09x, there were no changes observed in either rates of success or completion. While there was an observed negative change in both student success and completion rates for the Math 09x course, there were external factors that suggest that this change may not have been due to the adoption of a new curriculum. Immediately prior to the fall 2012 semester, SCC changed the placement system they were using to determine which math courses students would take. As a result, students who in previous years would have been placed into a lower math course based on their placement test scores were instead put into Math 09x. In this case, this policy change is perfectly confounded with the adoption of open materials. Given the similarity in the process and content of the materials in Math 09x to other courses, and the absence of a similar pattern of change in those other courses, there is likely reason to doubt that the change in student success and completion for that course is attributable to OER adoption. Future studies and evaluation cycles at SCC might seek to further explore whether the OER in Math 09x functions differently than the OER in other courses and to what extent this policy change at SCC impacts student success and completion in Math 09x.

The patterns of student and faculty responses to the open texts used reveal largely favorable receptions to the open resources. Students were not specifically asked to compare their experience with the open texts with other traditional curricular materials they had used, but their responses indicated an overall level of satisfaction with the OER. Perhaps not surprisingly, in open responses, students focused on the cost of the books rather than the quality of the books in comparative statements.

Faculty, on the other hand, were asked to make comparisons between the quality of the open and traditional materials. While responses tended to favor open materials in terms of overall quality, there was disagreement among the instructors. This is perhaps not surprising considering historic diversities of preference of faculty with regard to textbooks and a wide range of other learning materials. But one interesting thread coming from teacher open responses was a sense that teachers were aware that flaws in open textbooks could be readily fixed. For example, in response to the question, "Do you feel that the OER materials adequately supported the work that was completed OUTSIDE the classroom? Why or why not" one teacher answered, "Yes, although I will rearrange some of the material next time around. For example, I like to cover properties of exponents BEFORE exponential and logarithmic functions as we use these properties at that time in my class." Otherwise, teachers responded mostly positively about the utility of texts in promoting student learning both inside and outside of class.

It seems worth noting that the ability to ask these kinds of questions to teachers and students highlights a unique opportunity for evaluation of open educational resources. Because any materials used or produced are readily revised, remixed, reused, and redistributed at the campus level, student and faculty perceptions can be easily leveraged to provide real, meaningful improvement of materials for subsequent iterations of the course. The same questions asked of traditional textbooks, in contrast,

would by necessity be purely academic, since copyright restrictions would prohibit faculty from making substantive changes to those materials.

Ultimately, we believe that our key findings are that (1) there was not a strong correlation between using an open textbook and changes in student learning and (2) students whose faculty assign open textbooks potentially save a significant amount of money. OER can be used to drastically improve the affordability of education while adhering to the medical ethics maxim primum non nocere, "first, do no harm".

Conclusion

This study may represent an important step in examining how the use of open materials may influence both the cost of post-secondary education and student learning. While we can be certain that students and faculty members viewed these particular materials positively, it is not clear whether they had any impact on student learning. Additional research is needed to answer important questions in this area of study. For example, a future study could determine whether or not the use of open resources has a statistically significant effect on students obtaining and using resources for a course. It is possible that many students do not get the required and recommended materials for a course due to the cost of the materials. Does having all materials for courses freely online increase student access to these learning materials? Moreover, does increased access to materials lead to increased learning? Do students in distance education perceive OER differently from those in a face-to-face setting? Continued work in multiple contexts is needed to gain a more detailed view of what happens when OER are substituted for traditional learning materials.

Notice of full disclosure: Some of the authors of this study were involved in the adoption and modification of open materials discussed in this article.

OER Materials Discussed in the Article

The OER materials discussed in this paper can be found at http://sccmath.wordpress.com. Click the tabs at top to 09x, 12x. This will give links to the workbook and all videos. For links to the workbooks and textbooks for all classes, go to https://score.scottsdalecc.edu/?q=s13

For college algebra https://score.scottsdalecc.edu/?q=nodequeue/14

The Internet Mathematics Assessment System is available at http://www.imathas.com/.

References

Allen, N. (2011). *High prices prevent college students from buying assigned textbooks* [Press release]. Retrieved from http://www.studentpirgs.org/news/ap/high-prices-prevent-college-students-buying-assigned-textbooks.

Bissell, A. (2009). Permission granted: Open licensing for educational resources. *Open Learning, The Journal of Open and Distance Learning, 24*, 97-106.

Bliss, T. J., Hilton, J., Wiley, D., & Thanos, K. (2013). The cost and quality of open textbooks: Perceptions of community college faculty and students. *First Monday*, 18(1).

Bliss, T. J., Robinson, J., Hilton, J., & Wiley, D. (2013). An OER COUP: College teacher and student perceptions of open educational resources. *The Journal of Interactive Media and Education, 12*(1).

Buczynski,J. (2007). Faculty begin to replace textbooks with "freely" accessible online resources. *Internet Reference Services Quarterly, 11*(4), 169-179. Retrieved from http://dx.doi.org/10.1300/J136v11n04_11

D'Antoni, S. (2009). Open educational resources: Reviewing initiatives and issues. *Open Learning, The Journal of Open and Distance Learning, 24*, 3-10.

Downes, S. (2007). Models for sustainable open educational resources. *Interdisciplinary Journal of Knowledge and Learning Objects, 3*, 29-44.

Hilton, J., Wiley, D., Stein, J., & Johnson, A. (2010). The four R's of openness and ALMS Analysis: Frameworks for open educational resources. *Open Learning: The Journal of Open and Distance Learning, 25*(1), 37–44.

Hilton, J., & Wiley, D. (2011). Open-access textbooks and financial sustainability: A case study on Flat World Knowledge. *The International Review of Research in Open and Distance Learning, 12*(5). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/960/1860

Hilton, J., & Laman, C. (2012). One college's use of an open psychology textbook. *Open Learning, 27*(3), 265-272.

Lippman, D. (n.d.). http://www.imathas.com/

Lindshield, B., & Adhikari, K. (2013). Online and campus college students like using an open educational resource instead of a traditional textbook. *Journal of Online Teaching and Learning, 29*(1). Retrieved from http://jolt.merlot.org/vol9no1/lindshield_0313.htm.

Martin, A., & Lehren, A. W. (2012). A generation hobbled by the soaring cost of college. *The New York Times*. Retrieved from http://www.nytimes.com/2012/05/13/business/student-loans-weighing-down-a-generation-with-heavy-debt.html?_r=3&ref=business.

Perry, M. (2012). The college textbook bubble and how the "open educational resources" movement is going up against the textbook cartel. *American Enterprise Institute*. Retrieved from http://www.aei-ideas.org/2012/12/the-college-textbook-bubble-and-how-the-open-educational-resources-movement-is-going-up-against-the-textbook-cartel/.

Wiley, D., Hilton, J., Ellington, S., & Hall, T. (2012). A preliminary examination of the cost savings and learning impacts of using open textbooks in high school science classes. *International Review of Research in Open and Distance Learning*.

Wiley, D., & Green, C. (2012). Why openness in education? In D. G. Oblinger (Ed.), *Game changers*: *Education and information technologies*. Educause.

Athabasca University

Making Distance Visible: Assembling Nearness in an Online Distance Learning Programme

Jen Ross[1], Michael Sean Gallagher[2], and Hamish Macleod[1]
[1]University of Edinburgh, United Kingdom, [2]Hankuk University of Foreign Studies, Korea, Republic of

Abstract

Online distance learners are in a particularly complex relationship with the educational institutions they belong to (Bayne, Gallagher, & Lamb, 2012). For part-time distance students, arrivals and departures can be multiple and invisible as students take courses, take breaks, move into independent study phases of a programme, find work or family commitments overtaking their study time, experience personal upheaval or loss, and find alignments between their professional and academic work. These comings and goings indicate a fluid and temporary assemblage of engagement, not a permanent or stable state of either "presence" or "distance".

This paper draws from interview data from the "New Geographies of Learning" project, a research project exploring the notions of space and institution for the MSc in Digital Education at the University of Edinburgh, and from literature on distance learning and online community. The concept of nearness emerged from the data analyzing the comings and goings of students on a fully online programme. It proposes that "nearness" to a distance programme is a temporary assemblage of people, circumstances, and technologies. This state is difficult to establish and impossible to sustain in an uninterrupted way over the long period of time that many are engaged in part-time study. Interruptions and subsequent returns should therefore be seen as normal in the practice of studying as an online distance learner, and teachers and institutions should work to help students develop *resilience* in negotiating various states of nearness. Four strategies for increasing this resilience are proposed: recognising nearness as effortful; identifying affinities; valuing perspective shifts; and designing openings.

Keywords : Online learning; distance education; e-learning; higher education

Introduction

This paper is about the complex relationships that online distance learners have with the educational institutions and programmes they belong to (Bayne, Gallagher, & Lamb, 2012), and how these relationships can be made visible. Visibility provides educators a vantage point from which to theorize and work with these relationships and to help students develop the resilience required to manage different states of nearness they will experience. The first step working with these complex relationships is to assert that they are never static, even if students are in a geographical situation that looks, from the point of view of those on or interested in the material campus, simply "distant". There are intellectual and emotional distances that must be crossed in order to "arrive" on a programme and to engage with it. We argue in this paper that engagement oscillates through a continuum of nearness and distance, and that while nearness appears to represent the desired position, it is neither a fixed state, nor one whose meaning is stable. "Nearness" must continually be *assembled*, as online distance learners progress through the stages of formalized degree programmes and balance their other professional and personal commitments. There are elements of the assemblage – technological, relational, emotional, spatial – that can disrupt or bolster the resilience that students need to be able to manage the varying degrees of nearness to their programme that they experience over time.

We are defining resilience as the ability to navigate conditions of complexity and change. In practice, in this context, this mostly means that the student keeps going and successfully achieves the qualification sought. Sometimes it may mean making a positive choice that the course of study is not suitable, or not workable under the student's circumstances. Resilience is needed not to preserve or stabilise nearness, which is neither possible nor desirable, but to navigate the different levels of engagement that are a normal part of the experience of studying on a part-time, online distance programme. Most definitions of the term emphasise a core identity which is resistant to, or "absorbs" change (Weller & Anderson, 2013), but we argue that many factors, human and non-human, contribute to the possibility of resilience.

Online distance learning is primarily understood as the state of being "absent from the institutional space" (Raddon, 2006, p. 161). However obvious it may appear, this understanding is problematic, because it draws attention away from what *is*, towards what is *not*. Equally problematic, common assumptions about the spontaneous and portable nature of learning at a distance (Selwyn, 2011, p. 380) obscure the complexities of engagement and participation that constitute the distance learner's experience. Raddon (2007) describes a "key story" in narratives of distance students as being about "developing a level of flexibility about when, where and how they engage in paid work, and about taking personal responsibility for their development and future ability to remain in work by engaging in distance learning studies" (p. 77), drawing attention to the centrality of work in the lives of distance learners. And Selwyn's research with students on 'independent study' type distance programmes, where contact and collaboration are not required, found that students "were more accurately described as

striving to develop rigid procedures and fixed routines of studying" (2011, p. 380), even though they described flexibility as a key factor in their choice of study mode. Raddon and Selwyn are attempting to render the practices of distance education more visible, and putting them in their social and historical context, which inevitably leads to a more complex and richer picture of what it means to be a student at a distance. It also exposes tensions: These two authors present overlapping and possibly contradictory variables that may be institution-, programme- or even student-specific. In this paper, we offer insights from another context – one of a programme where the expectations of participation and contact are quite different from Selwyn's programmes, but where students must negotiate many of the same demands and pressures that both he and Raddon describe. We propose to view both distance and nearness as temporary assemblages.

Our argument is illustrated within a particular context: the MSc in Digital Education at the University of Edinburgh, a fully online programme designed for educators and learning technologists to explore learning, teaching, and training in digital environments[1]. Data used in this paper, comprising transcripts from 20 interviews, are drawn from the "New Geographies of Learning" project[2], a research project exploring the role of space and geography in online learning.

Online learners in formal programmes have to weather fluctuations in time and intensity in their engagements with the course. Often, these engagements and disengagements are multiple and invisible as people take courses, take breaks, move into the dissertation phase of the programme, find work or family commitments overtaking their study time, experience personal upheaval or loss, find alignments between their professional and academic work, graduate or withdraw. For part-time students, these comings and goings occur over several years. The MSc in Digital Education programme, designed with elements of flexibility in its presentation and progression, explicitly permits these engagements and disengagements, on the understanding that working, mature students are likely to need to pause their studies at some point during their three or more years on the programme. This permission may be explicit, but engagement and discussion with students about what it means, and what is needed, for them to come and go in this way may not be addressed so explicitly. In mediated, mostly asynchronous communication environments, it can also be difficult for teachers and peers to notice these shifts taking place, because silence may or may not denote absence, and so the resilience required of students is compounded by the online nature of the programme.

In addition, there is a group of students who start the programme together each year, taking the introductory "foundational" course over their first semester, but students then move at different paces and choose different paths through the programme, and sometimes do not work with members of this cohort again for some time, if at all,

---

[1] http://online.education.ed.ac.uk/
[2] http://edinspace.weebly.com

potentially leading to feelings of alienation or autonomy, depending on the student. The programme team on the MSc in Digital Education has attempted to mitigate possible fragmentation of the student group by working to make programme-wide digital spaces where a sense of togetherness can be built. Taught courses are a time of intensive collaboration and discussion, and new connections are forged during each of these. Strong affinities are created and sustained between students, and alumni are welcomed and included in the community. Nevertheless, the experience of distance in a relational, rather than a geographical, sense is one that most students will experience at some time or another on the programme.

In light of the challenging context of these arrivals, departures, and returns, universities offering online distance programmes, and teachers running them, can benefit from ways of thinking that attune them to the shifting relationships that students have with their formal programmes and their peers, and design strategies that build upon these comings and goings – viewing "nearness" as a temporary state that is assembled from particular combinations of people, circumstances, and technologies. The programme can be more or less central at different times, and different states of centrality can be seen as normal, natural, and even desirable. The concept of resilience is, in a sense, one way of making this complexity of comings and goings visible and designing strategies to support it. This paper proposes a number of such strategies for fostering resilience, by exploring how teachers and institutions can support students to cope with different degrees of nearness on distance programmes, drawing on relevant themes that emerged from the research data. Namely, this paper will be framed within the context of students' leaving and returning, and the process of students engaging with and disengaging from the programme. Research on the experiences of distance learners and the enactment of departures from online communities will be highlighted, interview data presented and discussed, and some positions that teachers might take in relation to an awareness of the shifting nature of their students' nearness to the programme will be proposed.

First, we briefly outline concepts – assemblages and departures – that inform our proposal that online distance learning should be viewed in the context of "assemblages of nearness".

Assemblages

In theories of sociomateriality, assemblages figure prominently. Fenwick and Landri (2012) describe most phenomena as being

> hybrid assemblages of materials, ideas, symbols, desires, bodies, natural forces, etc. that are always active, always reconstituting themselves. Sociomaterial studies shift the conversation from issues defined by the personal and the social to questions about these assemblages, how they move, and how they produce what may appear to be

> distinct objects, subjects, and events. How and why do
> certain combinations of things come together to exert
> particular effects? ...How do some assemblages become
> stable, and what force do they wield? (p. 3)

We argue that the assemblage that constitutes nearness in online distance learning is inherently unstable and temporary. In part this is because of what Bregman and Haythornthwaite (2003) call the "radicals of presentation" – the "root characteristics" of the genre of online environments (p. 122). In particular, they draw attention to the radical of visibility, of representation of self – and the effort required to avoid "'fading back'... becoming invisible so that the only trace left is a 'name on a screen'" (p. 130).

Its instability also stems from currently prominent discourses of "flexibility and insecurity" (Raddon, 2007) which inform the assumptions of distance learners about how their time and attention can and should be deployed across boundaries of work, study, and private time. These discourses suggest particular orientations to study which, as Selwyn (2011) has found, do not necessarily reflect the real practices and experiences of distance learners – they are "presumed flexibilities" (p. 367).

Finally, it is unstable because participation inevitably waxes and wanes multiple times over long periods of engagement such as those on the MSc in Digital Education. All of these factors are part of the assemblage of nearness: time; context; personal engagement; and the nature of the online environment.

Departures

Research on "departures" or "disengagements" from online communities is extremely useful in framing some of the issues of interest in this paper. Kazmer's work on disengagement from online educational programmes (2004, 2007) is particularly helpful, as is the small body of literature that explores departures (temporary and permanent) from multiplayer online games such as World of Warcraft (Dutton, 2007; Lee et al., 2007; Webber, 2012).

Kazmer describes certain sorts of social worlds (including educational ones) as "intrinsically transient" (2007, p. 112), by which she means that all those who participate do so with the expectation that such participation will be for a limited time only. The process of disengaging from such social worlds starts early – indeed, it is encoded in the arrival in the world – and involves both practical and emotional aspects (Kazmer, 2004). However, she focuses on one permanent disengagement, marked by graduation, rather than multiple temporary ones. Even where relationships continue afterwards, they are relationships in a new "social world":

> Students earning a master's degree in library and
> information science might be expected to join the social
> world of information professionals. That would be their

logical next world. It is possible, also, to have more than one logical next world. These students might also be expected to join the social world of alumni who graduated from the same program. (2007, p. 115)

Kazmer's model partly accounts for less clear-cut departures, but pathologises those who enact them as "problematic disengagers" – people who do not depart successfully within the parameters of what is considered normal for that social world (2007, p. 130).

In gaming contexts, particularly in massive multiplayer online role-playing games (MMORPGs), the practice of "quitting" is viewed as highly nuanced. Quitting can be spontaneous in response to frustration (so-called "ragequits"), and temporary (even if presented as permanent), and can involve both complex rituals of departure and sudden, sometimes permanent silences (Webber, 2012). Dutton (2007) describes three discourses of departure in what he calls "quitting texts", communications from departing players to the gaming community at large or a particular group of players in particular. These are: "virtual suicides" (where game characters are permanently deleted), "goodbyes" (nostalgic recollections and farewells), and "critiques" (criticisms of the game and attributions of blame for the departure). He explores how each of these types of quitting text is presented and received within game communities. As Webber says, departures (even if framed as permanent) are often received with skepticism, as it is so common for 'permanent' quitters to return – sometimes in a very short period of time (2012, p. 7). These practices of gaming departures are likely quite different from the ways in which students depart from formalised programmes of study, but the idea that "quitting" is complex and not always permanent is one that is highly relevant to our study.

We now move on to analyse interview data, exploring the ways in which comings and goings are described by distance students. It is important to remember as we proceed through these following sections that learners will move simultaneously between states of nearness and distance and presence and absence, respectively. These movements through these states are constructions, or assemblages, of their attachments to formalized programmes of study. The interview data presented here suggests that these comings and goings are in constant negotiation and are constantly being assembled; it is critical for teachers and organizations to recognise and work with this instability as they seek to help their students build resilience.

Assemblages of Nearness: Arrivals, Returns, and Spaces and Places

In this section, we present interview data that demonstrates some of the complexity of nearness involved in the practice of being a part-time, distance student on a contact-rich programme like the MSc in Digital Education.

The MSc is an accredited postgraduate programme at the University of Edinburgh, which has been offered entirely online since 2006. This is a programme with high levels of recruitment and student satisfaction, and a global spread reaching across 40 countries. We generated qualitative data with 28 individuals who are current students on the programme, or very recent graduates. Twenty interviewees were recruited to the study from a group of 150 current and recent participants, with an opportunistic emphasis on eliciting data across all years of study, and a global spread.[3] We used narrative methods within a series of online, text-based interviews[4] to explore with students the tales of their own arrival at Edinburgh at the start of their studies, seeking talk which related specifically to students' construction of the spatiality of the distance mode, and their conception of the institutional presence of the university. The notion of arrival was used in this context deliberately to problematise the association of study with a fixed academic geography, but it also had the unexpected effect of highlighting how students experienced multiple points of arrival (and departure) through their time on programme. Transcripts from the text chat were anonymised, pseudonyms allocated, and the data were collaboratively and thematically coded using the online software Dedoose. Some of these themes are illustrated here, with the use of verbatim extracts from the text chat transcripts.

One consistent theme found in most of these transcripts was resilience, a capacity for navigating changing states of nearness and distance, presence and absence. Resilience can be viewed as an assemblage itself, an intersection of nearness or distance, of presence or absence, and of a capacity for navigating this fluid terrain. Resilience is a critical element for teachers or organizations to identify and build strategies for developing in their students.

Arrivals

Many interviewees described their arrival on the programme as complex. For some it happened more than once, and for one not really at all. These accounts are intended to demonstrate the variations in how students may experience their arrivals on an online distance programme, underscoring the need for practices that support resilience to be flexible enough to take such difference into account.

---

[3] Students participated in the research from Australia, Croatia, Italy, Japan, Korea, Mexico, Nigeria, Poland, Spain, Tanzania, UK, and the USA.

[4] The interviews were conducted one‑to‑one via text chat in Skype.

Preparing for arrival can be a process of alignment, as day-to-day life is restructured to accommodate new demands and experiences. This process is different from that of students who will travel to a campus to study full-time for a period, but where prospective online distance students recognise this possibility, they may engage in planning that sounds not dissimilar to preparing for a journey. Lorrie believed that planning to undertake the programme required a significant period of restructuring her life in order to accommodate it – a pre-arrival period that lasted a full year:

> I was preparing myself physically for a year before I decided to apply.
>
> Interviewer: Preparing yourself? How do you mean?
>
> Well, this study requires lots of time, so I had to figure out in my head how it would fit into my personal and business life. Also I had to prepare myself that I'm going to take an obligation that is serious and I want to do it as best as I can. (Lorrie Saterfiel)

It is not uncommon for students to plan to begin, or actually start on programme, and then find they have to defer due to unexpected events. Lilia described what this was like for her, an example of a temporary disengagement predicated by a reconfiguration of a work/life balance:

> I arrived late and got most things wrong.
>
> That was mostly because I'd had a super intense summer, professionally and privately too, certain things went wrong and I was exhausted.
>
> I was supposed to study full-time but ended up doing just one course... half way through the course I decided not to continue.
>
> It was amazing how much support I got from the whole team.
>
> ...anyway, i resumed in January.
>
> The arrival was easier in a way as I'd already rehearsed it. (Lilia Banton)

Online arrival can be disrupted, and it can also be somewhat fuzzy, if the "assemblage" of nearness does not emerge coherently right away. Selena remembered the first few weeks of the course as a 'blur' due to being ill and away from home:

> I was actually in the States during the orientation period, and I participated as much as I could I was undergoing medical treatment ...So, let me see... what happened next.. it was kind of a blur then, as I had to rest for 2 weeks. (Selena Lamon)

For some online students, the University's material processes assert themselves in unexpected ways, creating a shadow arrival that reveals the imperfect mapping of distance students' needs onto established institutional practices. These processes are a part of the assemblage of what it means to be a student at Edinburgh, and cannot always accommodate distance *from* Edinburgh. Erik's arrival story, despite his living and planning to study entirely outside the UK, included an on-campus visit for a learning assessment to formalise support for his dyslexia:

> This involved travelling up to Edinburgh and a full ed psych report... So I guess in some respects my start point was in August when I visited the University for this purpose... (Erik Credle)

Darcy, as a member of staff at the University, found it necessary to arrive over and over again as she met tutors offline and online with her different 'hats' (staff and student) on:

> It made me feel like a fraud sometimes... I don't mean that bad but on occasion I would bump into the course tutors as I was wearing [m]y staff hat and not student hat (I did so last week again) and it is awkward as you want to chat to them as a student but somehow you are not in a [discussion board].... It is strange, I have had that quite a few times now and I am never quite sure. (Darcy Boateng)

For Darcy, geographical closeness to, and institutional links with, the programme's teachers created confusion. The programme is not designed for such encounters, and in such cases, material presence may hinder, or at least radically disrupt, nearness.

Different degrees of nearness are experienced by most students at different times, but some students never feel they fully arrive. Patrick experienced the whole programme at something of a remove: "I suppose I'm a fairly reluctant academic... necessity brought me to study the course ...it always comes after family and work commitments" (Patrick Hewitt). Perhaps for this reason, his affinity with Edinburgh, and the programme, was never strong:

> I just work on the course in the same way someone can read a book or do a crossword without feeling they are in anyway with the authors. I'm fully engaged in the course

> but I just don't feel I belong anywhere other than where I
> am. (Patrick Hewitt)

Though not a barrier to academic success on his courses, he did feel the lack of community engagement as a disadvantage, attributing this to factors including his pace, his willingness to commit time, and to the mediated nature of the programme:

> I never really felt that the community bit worked as well
> as I'd hoped... I never really got to know that well other
> students as it's just more hard work communicating via
> text and also taking the slow route meant that many
> would come and go and leave me in their wake. (Patrick
> Hewitt)

These passages indicate the complex and nuanced manifestations of arriving on a programme. For some, these arrivals were complicated by parallel engagements with institutional practices; for others, the process of arrival was interpreted as incomplete or repeatedly enacted. These arrivals influence the assemblage of nearness that students experience. There is no shared experience of arrival, and therefore no fixed processes of resilience-building that will suffice. Instead, such processes must take difference and change into account, and the concluding section of the paper suggests four ways this might be approached.

Returns

The things that keep students near or bring them back, their affinities with the programme, are as varied as their arrivals. For Lilia, someone who made relatively little use of the discussion elements of the programme and worked largely independently, the programme contributed to a creative transition in her life:

> On one of the courses I suddenly felt online gave me an
> opportunity to express myself, including creative
> expression,
>
> something I was really into as a teenager but something I
> gave up on when I became an adult.
>
> It was like rediscovering yourself... it was like a fish
> being put back into water if you know what I mean. (Lilia
> Banton)

Lilia's affinity with the programme was strong, but personal, and as a result perhaps not always visible to tutors or fellow students. And affinity or nearness can create other kinds of unseen effects. Max, whose time on the programme led him to further, doctoral-level study, described the programme, and particularly the facilities he gained access to, as spurring a significant transition:

> I had always had the idea of further postgrad study in the back of my mind,
>
> but the MSc really brought that to the fore,
>
> and gave me access to the facilities that allowed me to pursue this.
>
> so at the end of the MSc, I feel quite different from when I started. (Max Crary)

Personal engagements appear to form a strong foundation for affinity and resilience, and these may become visible through the required participation elements of courses: through assessment. The MSc in Digital Education engages students in self-selecting topics and self-nominating extra assessment criteria, as well as in opportunities to represent knowledge in creative and multimodal ways, and the quality of many of the assignments students produce is exceptional. Teachers might look to assignments not only as evidence of achievement of learning outcomes, but as opportunities to see something of how nearness is being assembled for students at a particular moment in time.

Other affinities relate to the circumstances of participation, and the extent to which the programme offers support for, or sometimes freedom from, challenges students are facing. Eve's chronic health condition contributed to her decision to study in an online distance mode, and her success in her courses and ability to undertake her study felt like "escape":

> Interviewer: How does the university 'feel' to you online?
>
> Eve Maltby: Maybe as a sense of space, freedom, opportunity, as it is defined in opposition to the rest of my life
>
> ...I wonder if it is almost somewhere to escape to - actually yes, that makes sense. For the short time each day when I am engaged with the course, I no longer notice the const[r]aints that dominate the rest of the time.

Matthew's affinities were largely to other participants:

> Interviewer: You've talked about friendship and community this evening - will graduation represent a departure from the special group you've been part of?
>
> Matthew Gillon: No, I don't think so.

Affinities, as presented here, can refer to transformation, support, and social connections. These affinities, if recognised, can give students the support to be resilient in the face of unexpected disruptions to their study. Teachers might help students identify and connect with these affinities to build resilience.

Teachers and support staff can take important roles, also, by actively engaging with students at points of temporary departure. For Noreen, a need for a suspension of her studies was a point where she might have been treated by teachers, as she put it, like "just another number", but instead she felt supported, as if she was a "regular student", and this gave her the determination to return and succeed:

> They treated me from the beginning as a regular student. Like I said before this came across when I had to stop and suspend the course. It could have been so very different, they could have dismissed me as someone who they would never see and I was just another number ... but it wasn't the case at all.
>
> Interviewer: They were understanding?
>
> Yes, made me feel completely relaxed and it was a very stressful time for me. it just wasn't a problem... It made me determined to do well and complete it no matter (Noreen Reddy)

For others, like Allie, life events can prove so disruptive that momentum is difficult to regain. Allie described a combination of a family bereavement, technical troubles, and work pressures as throwing her off course in ways she was having trouble recovering from:

> I was very engaged initially, but this episode threw me.... I also decided not to do a module last spring. But that was due to needing to reorganize my business because with the recession, my business has really dropped off. Unfortunately, I didn't have time to focus on my business because [a parent] passed away... I am now doing a module but am still split as I need to focus on my business. So I guess at the moment, I am finding it hard to engage although the spirit is very willing. (Allie Ruther)

Sometimes when this happens, because of the flexibility the programme offers, students take long breaks – up to a year and occasionally even longer between courses. Returning after such a break can be extremely challenging. As Noreen put it, the flexibility that

appears to come along with online distance learning can be something of an illusion, at least when it comes to pacing:

> One thing I loved about doing an online degree was that I could read the materials in my own time. I had the flexibility to work through the materials in my time. I had two young children at the time and working full time. However, going forward to now this course is different because of the technology we have at our disposal. It is more interactive which means its not just about reading something and then creating an essay at the end. (Noreen Reddy)

Indeed, because the programme is so contact-intensive, students describe even a few days' absence during courses as leaving them "panning for nuggets of insight in an increasingly voluminous river" (Erik Rumery).

In other respects, though, flexibility is a key aspect of students' crafting of resilient and creative stances to their programme participation. Variables of space and place, arrivals and departures, and the emotional and intellectual content circulated through them, reveal some of the complexity of the relationship between students and online programmes. These fluid relationships are assembled based on need, motivation, affinity, and circumstance, and these assemblages define nearness and distance in this context. Student resilience in navigating these relationships and this terrain is an expression of this complexity, and mechanisms to support this resilience are discussed in the concluding section.

Conclusion

This paper has demonstrated that the relationships between online distance learners and their affiliated educational institutions are complex. It has organised this complexity within the context of a conceptual framework of nearness as temporary assemblage, where students engage and disengage with the institution at varying intervals and with varying degrees of affinity. It has shown that arrivals and departures are influenced by outside commitments, shifting priorities, technologies, and relationships with the programme, the institution, the academic community, and the subjects with which they engage.

These complex relationships, influenced as they are by assemblages of nearness, arrivals and departures, and presence and absence, ultimately influence the resilience of the students in navigating the formalized programme of study. Resilience is an attribute that teachers can consider designing for. As such, we close by proposing four strategies that teachers might consider helpful for supporting students' resilience to shifts in engagement with online distance programmes of study.

1. **Recognise nearness as effortful**. Nearness enacts a cost and requires an effort that may not always align with the expectations, motivations, and commitments of the student. Even when it does, it will not be an effort that can be maintained at the same level indefinitely. These misalignments and shifts of effort can be productive, if prospective and continuing students are helped with strategies for making the effort, and reassured that times of both nearness and greater distance are normal. This might prove to be a valuable part of pre-arrival and induction processes for online distance programmes, perhaps expressed through a series of narratives from other students about how they have navigated the formation of their own assemblages of nearness, coped with disruptions, and experienced periods of greater distance. New students might then prepare themselves for the effort involved not only in doing the work, but in making and sustaining connections and affinities, and recognise when this is and is not working well for them.

2. **Identify affinities.** As we have seen, affinities can be personal, social, and structural. They will also be found both inside and outside the formalized aspects of the programme, and students might seek to build on the commitments that bridge their professional, personal, and academic worlds. Assessment practices that give students opportunities to articulate their positions and meaning-making in the context of programme content might make affinities visible. These practices might have reflective elements, or be based on topics that students select. Teachers might also suggest strategies for identifying affinities – ways of noticing where areas of excitement or preoccupation might indicate productive areas to focus on.

3. **Value perspective shifts**. By viewing nearness as continually assembled, we open spaces for considering the value of the different perspectives that come at times of greater nearness and greater distance. One benefit of studying part-time is that there is more time for ideas to be cultivated, and for insights to emerge in unexpected ways. Where students are recording their developing ideas online (in discussion boards, blogs, wikis, and so on), traces of perspective are laid down and made visible. Teachers might use these traces in more deliberate ways, setting students occasional tasks of revisiting and examining an older perspective of their own, valuing the forgotten insight, the former preoccupation, a past configuration of knowledge that may spark new engagements.

4. **Design openings**. Where students are in periods of greater distance, perhaps even alienation, returning can be challenging (as we saw Allie describe). Creating "openings", or invitations, that normalise distance and acknowledge the challenges of reassembling nearness, might help students to find their way back "in". These invitations might be personal and direct (a friendly email), or more diffuse (a programme space that is easy to check in to, such as a Twitter feed or a social hub). What we should be seeking to do, as teachers on online

distance programmes, is to design opportunities for potential reconnection that students can build on when they need them. Such openings need not disappear after graduation either – they can continue to be part of the shifting relationships between programmes, teachers, and current and former students that an online distance programme makes particularly possible.

More work still needs to be done to make distance visible, and to design strategies for making use of this visible distance. It is not enough to design a programme for flexibility. We must also understand and work with students' experience of that flexibility – an experience which can be both fertile and troubling. This is not primarily about increasing retention, though greater retention rates might be an outcome of this understanding. Rather, this is about increasing the satisfaction and provocation that students and teachers can get from shifts of perspective that come with approaches and retreats, and in seeing the value in times of greater distance as well as greater closeness to their work on online distance programmes. It is about understanding the nature of student assemblages of presence and distance, how these are in constant negotiation. It is about increasing students' resilience in navigating the variations of distance and perspective encountered in a formalized programme of instruction.

References

Bayne, S., Gallagher, M., & Lamb, J. (2012). Being 'at' university: The topologies of distance students. University of Edinburgh.

Bregman, A., & Haythornthwaite, C. (2003). Radicals of presentation: Visibility, relation, and co-presence in persistent conversation. *New Media & Society, 5*(1), 117-140.

Dutton, N. (2007). *Participatory quitting: Quitting texts and World of Warcraft player culture.* Scripps College of Communication of Ohio University.

Edinspace: New Geographies of Learning (2012). University of Edinburgh. Retrieved from http://edinspace.weebly.com.

Fenwick, T., & Landri, P. (2012). Materialities, textures and pedagogies: Socio-material assemblages in education. *Pedagogy, Culture & Society, 20*(1), 1-7.

Kazmer, M. (2004). How technology affects students' departures from online learning communities. *SIGGROUP Bulletin, 25*(1), 25-30.

Kazmer, M. (2007). Beyond C U L8R: Disengaging from online social worlds. *New Media & Society, 9*(1), 111-138.

Lee, I., Yu, C.-Y., & Lin, H. (2007). *Leaving a never-ending game: Quitting MMORPGs and online gaming addiction.* Paper presented at Situated Play, Proceedings of DiGRA 2007 Conference, Tokyo.

Raddon, A. (2006). Absence as opportunity: Learning outside the institutional space and time. *Journal of Further and Higher Education, 30*(2), 157-167.

Raddon, A. (2007). Timescapes of flexibility and insecurity : Exploring the context of distance learners. *Time & Society, 16*(1), 61-82.

Selwyn, N. (2011). 'Finding an appropriate fit for me': examining the (in)flexibilities of international distance learning. *International Journal of Lifelong Education, 30*(3), 367-838.

Webber, N. (2012). Discourses of departure in massively multiplayer online roleplaying games (MMORPGs). Birmingham City University.

Weller, M., & Anderson, T. (2013). Digital resilience in higher education. *European Journal of Open, Distance and E-Learning, 2013*(1). Retrieved from http://www.eurodl.org/?p=current&article=559

Athabasca University

Evaluation of the Vocational Education Orientation Programme (VEOP) at a University in South Africa

Lynette Jacobs and Corene De Wet
University of the Free State, South Africa

Abstract

To address the training needs of Further Education and Training college (FETC) lecturers, and in the absence of a full professional education qualification, several higher education institutions, FETCs, and other bodies in South Africa formed an alliance to develop a short programme towards a possible future full qualification. In 2010 a Vocational Education Orientation Programme (VEOP) was piloted. In line with the responsibility for quality assurance, and the need to inform further developments in the training of FETC lecturers, the aim of this research was to evaluate the VEOP presented by the University of the Free State (UFS). To reach the stated aim, a two phase evaluative study was undertaken (1) to assess the individual modules, and (2) to holistically investigate the quality of the programme. Two questionnaires were used to gather data. The first set of data was collected at the completion of each of the six modules. For the second phase of the study, 48 lecturer-students were randomly selected more than a year after completion of the VEOP. The study identified a number of strengths and weaknesses of the VEOP. The results emphasise the need to carefully select tutors and train them to have an understanding of the FETC milieu, rethink the methodology employed in the education training of FETC lecturers, and redesign the modules' contents to better reflect the FETC sector. The need to enhance student support and improve administration is also highlighted by the study. The results of the study may inform the development of a full qualification for FETC lecturers.

Keywords: Distance education; further education and training; programme evaluation; South Africa; sub-Saharan Africa; vocational training

Background to the Study

Changes in the labour market and in the worlds of work have influenced the provision of educational services. Much is expected from the Further Education and Training College (FETC) sector in South Africa to provide intermediate-level and artisan skills. There is a significant shortage of people to fill positions in the technical and associated professional occupational categories and, if skilled, they will alleviate the massive unemployment problem in the country (DHET, 2012a; Powell, 2012). FETCs provide pre-service training to young students, up-skilling, and the retraining of adults, as well as supporting adult students through literacy and numeracy training (Powell, 2012). In 2013 more than 600,000 students were studying at 50 FETC in South Africa (Financial Mail, 2013). FETC lecturers are "a crucial component in the skills development challenge in South Africa" (Akoojee, 2008, p. 310). The work environments of FET lecturers are complex and continually changing (Williams, 2010). Increasing student numbers and broadening of programmes offered need to be matched by an improvement in the quality and quantity of the lecturers (Akoojee, 2008). The need for FET lecturers to develop contemporary skills in teaching, learning, and assessment (Williams, 2010) was acknowledged by the South African Department of Higher Education and Training (DHET). In the Government Gazette of 28 August, 2009, the DHET proposed *The National Policy Framework for Lecturer Qualifications and Development in FET Colleges in South Africa*. The intention was to establish "a national standard for lecturers in FET colleges" within the landscape of global competitive markets (DHET, 2009, p. 4). The aim of the framework was to ensure that FETC lecturers enhance their professional competence and performance, and to equip them for their essential and demanding teaching and assessment tasks. On 21 August, 2012, the second draft of this policy framework, the *Policy on Professional Qualifications for Further Education and Training College Lecturers*, was published. It differs radically from the first document. It has been aligned with the Higher Education Qualifications Framework (HEQF), and now requires currently employed lecturers to complete a Diploma in Vocational Education (DHET, 2012b). This is in line with international trends to move FETC lecturers' training towards professionalisation, standardisation, and certification (Papier, 2010a).

While the finalisation of a framework for FETC lecturer qualifications is still in process, the need for training these lecturers is a pressing concern. Papier (2010b, pp. 1-2) states that "there is an urgent need for national authorities to address the training concerns of college lecturers by finalising the framework" while emphasising the importance of acknowledging the difference in training needs between FETC lecturers and school teachers. Papier (2010b) also highlights the low morale of the FETC personnel, as a result of insufficient action towards the professionalisation of the lecturers, and the concerns of FETC lecturers about their pedagogical knowledge and workplace exposure. Nkosi (2012) specifically mentions FETC students' discontent as a result of a deficit of management and governance skills amongst FET staff. Furthermore, he refers to the lack of qualified FETC lecturers at colleges in South Africa. Using the National Policy

Framework for Teacher Education and Development in South Africa which specifies that all school teachers must have a degree, as a benchmark to evaluate FETC lecturers' qualification, Cosser, Kraak, and Winnaar (2011) found that in 2010, 57% of FETC lecturers have less than a degree/higher diploma.

To address the training needs of FETC lecturers and in the absence of a full qualification, several higher education institutions, FETCs, and other bodies formed an alliance to develop a 30-credit short programme towards a possible future 120-credit Vocational Education Certificate (Level 5) (DHET, 2012b). In 2010, a Vocational Education Orientation Programme (VEOP) was piloted and continues to be delivered. The VEOP aims to

- initiate FET lecturers to the FETC policies, context, and skills environment;
- enable FET lecturers to interpret curricula and plan relevant learning and assessment activities;
- facilitate the discovery of appropriate integrated teaching and assessment strategies;
- develop an understanding by FET lecturers of learners, learning processes, and a culture conducive to learning; and
- enable FET lecturers to manage administration processes. (DHET, 2012b)

Several principles underpin the VEOP, namely practical classroom application; relevant theory; respect for adult learners and their previous experience and contribution; cultural diversity, tolerance, language appreciation and inclusivity; innovative teaching and learning strategies; the context of a lecturer's subject specialisation; an understanding of the future workplace of learners; and assessment which should include classroom observation and guidance (DHET, 2012b).

The VEOP offered by the School of Open Learning (SOL), in conjunction with the Faculty of Education of the University of the Free State (UFS), is aligned with the abovementioned general aims and principles agreed upon by the aforesaid alliance. It is a 30-credit short course at the HEQF Level 5. The VEOP consists of 300 notional hours that includes contact time, self-study, classroom practice, and assessment. It offers 6 modules developed by the UFS, and a seventh developed by the Swiss-South African Co-operation Initiative. Table 1 provides the layout of the modules.

Table 1

Modules Offered in the VEOP

Module	Credits	Title of module
1	2	The FET college: policy and workplace contexts
2	8	Methodology: integrated teaching and assessment
3	5	Conducting and managing assessment
4	6	Curriculum interpretation and planning
5	4	Understanding and managing the learner
6	1	Becoming a reflective practitioner
7	4	Workplace-based experience

In August 2010, the first cohort of 256 FETC lecturers was registered for the VEOP pilot programme of the UFS, in five centres: Bloemfontein (63), Thaba 'Nchu (21), Kroonstad (31), Sasolburg (30), and Qwaqwa (111). The lecturers completed their programme in April 2011. Of these 256 lecturer-students, 171 (66.8%) completed the programme successfully.

The VEOP offered by the SOL is essentially a distance programme, with limited contact. The Association for the Development of Education in Africa (ADEA) (2002) found with increasing demand for access to educational opportunities at all levels, and the often decreasing budget in real terms for education provision, there has been a growing interest in sub-Saharan Africa in the possibilities of distance education as an important and credible part of education delivery strategy designed to enable greater access to quality education. Distance education as a complementary mode of delivery is often used for initial teacher training as well as teacher development in sub-Saharan Africa (ADEA, 2002), Latin America and South Asia (Perraton, 2007), Turkey (Gültekin, 2009), India (Mishra, Vijayshri, & Garg, 2009), the United Kingdom (Sampong, 2009; Wilson, 2008), and Australia (Sampong, 2009).

Distance education as a complementary mode of delivery was initiated as an effort to overcome the challenges of access, equity, cost effectiveness, and quality for higher education (cf. Sampson, 2003). Perraton (2007) defines distance education as "an educational process in which a significant proportion of the teaching is conducted by someone removed in space and/or time from the learner" (p. 12). Sikwibele and Mungoo (2009) expand on this definition and argue that distance education refers to

> ... a planned and regular educational provision where there is distance between the instructor and the learner. Generally most conceptions [of distance education] point to the following features : (a) absence of a teacher, (b) use of mixed media in teaching and learning, (c) correspondence, (d) independent learning, and (e) possibility of face-to-face meetings with tutors. (p. 4)

Sampson (2003) found that distance education serves those who cannot or do not want to make use of traditional classroom teaching. Demanding professional commitments and family responsibilities often make attending a conventional, full-time, face-to-face course with fixed timetables impossible (Sampson, 2003). Sikwibele and Mungoo (2009) additionally list the following benefits of distance education: It allows the training of more people, it can be delivered to home and work sites, and it is learner-centred and affords students more control of the pace and learning styles. Distance education is thus convenient, flexible, and adaptable. This suits full-time professionals such as FETC lecturers. Distance education methods have been used to teach, develop, and support teachers for many years (Aluko, 2009; Mishra et al., 2009). The effectiveness of distance education for teacher training is well documented (cf. Aluko, 2009). Distance education is thus the only viable option for reaching groups of FETC

lecturers who are full time employees at FETC in often remote rural areas. As an in-service training programme the VEOP does not deplete FETC of lecturers as they learn as they work.

The two most important problems associated with distance education are high attrition rates and quality assurance (Sikwibele & Mungoo, 2009). It is therefore understandable that quality assurance is an important research area in distance education (Zawacki-Richter, 2009). Programme evaluation is an essential aspect of quality assurance.

Evaluation of the Programme

The need for higher education institutions to evaluate themselves continuously is highlighted by the HEQC of the Council on Higher Education (CHE, 2005) which states that

> Primary responsibility for programme quality rests with higher education institutions themselves. Institutions should seek to establish and sustain effective mechanisms that facilitate programme quality and yield reliable information for internal programme-related planning and self-evaluation, external evaluation, and public reporting. (p. 6)

Aluko (2009) argues that measuring the success of any educational programme has been recognised as an important and fundamental form of institutional accountability. Sampong (2009), moreover, believes that successful programme development cannot occur without evaluation. In distance education, programme evaluation encompasses the evaluation of programme objectives, content, instructional design, support services, assessment practices, student achievement, and the use/impact of technology to improve the quality of teaching-learning, to enhance the relevance of the programme, to access how the programme is perceived by its stakeholders and meet their expectations, and to provide regular feedback on the factors that affect outcomes (Mishra et al., 2009). In the evaluation of distance education programmes, cognisance should also be taken of the American Distance Education Consortium's (ADEC) principles for good practice:

- Design for active and effective learning by considering the needs and characteristics of the learners, the nature of the content, appropriate instructional strategies and technologies, and the desired learning outcomes.

- Support the needs of the learners by providing advisory, technical, and library support.

- Develop and maintain technological and human infrastructure.

- Sustain administrative and organisational commitment to quality by integrating distance education into the mission, providing financial commitment, including faculty development and rewards, training to support those involved, and including marketing and management structures to promote and sustain distance education programmes. (Buford, 2005)

Feedback instruments designed to help Australian training organisations to measure the quality of vocational education and training include items on trainer quality, satisfaction, effective assessment, clear expectations, learning stimulation, training relevance, competency development, training resources, effective support, and active learning (Coates, 2009).

VEOP presented by the SOL is essentially a distance programme, with limited contact sessions intended for FETC lecturers. The evaluation of the VEOP was consequently guided by ADEC's principles for good practice (Buford, 2005), as well as Sampong's (2009) and Coates's (2009) guidelines for distance and FET evaluation, respectively.

Aim of the Study

In line with the responsibility for quality assurance, and the need to inform further developments in the training of FETC lecturers, the aim of this research was to evaluate the VEOP presented by the UFS. To reach the stated aim, a two phase evaluative study was undertaken (1) to assess the individual modules, and (2) to holistically investigate the quality of the programme. The programme evaluation is aimed at improving the current programme, as well as informing the role-players towards the development of a full qualification. The DHET (2012b) anticipates that the VEOP will form an integral part of the Diploma in Vocational Education.

Research Method

Survey instruments have been identified as being the most popular data collection tools in outcomes measurements and evaluation (Aluko, 2009; Sampson, 2003). Two questionnaires were used to gather data about the student-lecturers' views of the VEOP at the UFS. The first questionnaire was developed by the staff of the quality assurance office of SOL. It has been used numerous times since 2005 to elicit the views of students on the different modules that form part of a wide variety of education programmes administered by SOL. The survey instrument used during the second phase of the study, compiled by the authors, was based on the content of the programme documentation submitted for accreditation. It was piloted in 2012 using 10 students from Bloemfontein (where the university is located) who did not form part of the sample in the study. The

pilot process enabled the researchers to improve some questions which appeared to be ambiguous.

Items in both questionnaires relied heavily on existing programme evaluation questionnaires and observed evidence (cf. Coates, 2009; Mishra et al., 2009; Sampong, 2009; Sampson, 2003; Taylor-Powell & Renner, 2000). The questions in the second survey were also based on the learning outcomes of the programme, as well as the principles that guide the programme (cf. Aluko, 2009). The researchers, furthermore, entered into lengthy discussions with the dean and the director of short courses at SOL to determine their perspectives on VEOP, their expectations of the evaluative study, and their views on the future of VEOP at SOL. They also acted as critical readers in the development of the questionnaire used during the second phase of the study. Insights gained from the discussions were incorporated into the questionnaire.

The data were captured and checked for accuracy by an experienced typist. The data were analysed, using the STATA IC11 software.

The data were analysed using the mean score, as a measure of centrality, and the standard deviation, as a measure of spread, to summarise the data. We then explored the differences in measurements between groups, using techniques that are typically used in inferential studies (the student's *t*-test and the one-way ANOVA*).* However, in this study, we do not claim inferences beyond this case; we used the techniques to merely differentiate between groups to gain partial insights into the VEOP programme at this institution.

The internal reliability of the questionnaires was checked by calculating the Cronbach's alpha coefficient. The overall Cronbach's alpha coefficient for the rated responses during the first and second phases of the study was calculated to be 0.9002 and 0.9532 respectively, which indicates that the responses have a high level of reliability.

Sampling and Data Collection

The first set of data was collected at the completion of each of the modules during 2011. Each lecturer-student received a module evaluation form on completion of each of the first six modules, on which they could provide feedback on their experiences during the module. Of the 1,536 evaluation forms distributed to lecturer-students, 418 were returned of which 412 could be used.

The second set of data was collected from the same cohort of students during 2012 more than a year after the lecturer-students had completed the short programme. This survey was purposefully conducted after a substantial time had elapsed after completing the programme, to allow the lecturer-students to reflect on their experiences in the year following the programme. This survey focused on the quality of the programme, and not on specific modules, although the outcomes of the various modules were included as part of the purpose of the programme. For the second phase of the study, 60 lecturer-

students were randomly selected from three campuses, also randomly selected. They were telephonically invited to participate in the survey. Of the lecturer-students, 48 agreed to take part in the survey. The survey questionnaire was hand-delivered to each of them by an independent courier, commissioned by SOL, who had no connection or interest in the programme. The participants responded to the questionnaire at their convenience, sealed the questionnaire in the envelope provided, after which it was collected by the courier.

Ethical Considerations

Permission for this study was obtained from the dean of the SOL, as well as from the director of this programme. The participants' dignity, privacy, and interests were respected at all times. With the exception of a question asking the participants to indicate the campus at which they study/studied, the questionnaires did not contain any identifying aspects, names, addresses, or code symbols. Before completing the questionnaires, the participants were informed that the process was completely voluntary and that they could withdraw at any stage during the process. They were also informed during the first phase of the study that whether they chose to participate or not would have no effect on their grades or evaluation. The questionnaires were collected by administrators from the quality assurance office and not the tutors of the modules. They received no financial or other reward for taking part in this study.

Results of the Study

The most important results of the study are reported below, based on feedback from both surveys.

First Phase of the Study

The first survey focused on the quality of the modules relating to four aspects, namely the content of the modules, the teaching and learning related to the module, the teaching material, and the assessment during the module. The lecturer-students had to relate their experiences of each of the modules on a 5-point Likert-scale (ranging from *strong disagreement* to *strong agreement*). As a score of 3 indicates neither a positive nor a negative response, and only 4 and 5 indicate an agreement, any mean score of less than 4 should raise concerns, in terms of the quality of the specific module.

In discussing the results, the four aspects related to the modules will first be analysed (Table 2); thereafter, a comparison will be made of how the various modules were rated (Table 3). Aggregated ratings are provided in Table 2.

Table 2

Aggregated Feedback on Aspects of the Modules

Aspects	Mean (*M*)	SD (*s*)
Content	4.0336	0.3892
Teaching and learning	3.8808	0.8350
Study material	3.5231	0.8270
Assessment	4.0867	0.4448
Combined	3.8811	0.5698

From the combined score it can be seen that the respondents perceived the assessment to be the best aspect of the modules (M = 4.0867), followed by the content (M = 4.0336). The study material seems to need the most attention (M = 3.5231), and then also the teaching and learning aspects (M = 3.8808). The aggregated scores of the respondents on details regarding each of the four aspects are summarised in Table 3 (ranked from highest to lowest per aspect).

Table 3

Lecturer-Students' Perceptions on Details Regarding the Various Modules

		Mean *M*	Standard deviation *s*
Module content	There was a link between the module content and the learning outcomes	4.086	0.761
	The content provides the opportunity to develop skills	4.085	0.791
	The content of the module linked up well with other modules in the programme	4.044	0.808
	The content of the module is understandable	4.034	0.821
	The content of the modules is well organised	3.927	0.862
Teaching & learning	The lecturer encouraged student participation in class	4.385*	0.796
	The module has developed my subject knowledge	4.226	0.852
	Opportunities were created for the application of the theory	4.127	0.799
	The teaching activities helped me to achieve the stated learning outcomes of this module	4.107	0.779
	The time was sufficient to achieve the outcomes	3.951	0.995
	The lecturer used teaching aids effectively	2.929#	1.368
Teaching material	The study guide was a valuable aid to learning	4.012	0.858
	Additional teaching materials were valuable aids to learning	3.037	1.349

		Mean M	Standard deviation s
Assessment	The lecturer returned marked work within a reasonable time frame (e.g. two weeks)	4.218	0.975
	The feedback on the assessment helped me learn from my mistakes	4.193	0.839
	Assessment tasks were linked to module outcomes	4.118	0.687
	Assessment criteria were applied consistently	4.015	0.797
	The assessment criteria were clear	3.998	0.878
	The assessment tasks were clear	3.998	0.873

*   Rated the highest

Rated the lowest

The issues that were rated the highest were the encouragement from the lecturer towards student participation (M = 4.385), the extent to which the module enhanced the student's subject knowledge (M = 4.226), and a reasonable timeframe within which submitted assessment tasks were returned (M = 4.218). The two issues that need the most attention are the lack of effective use of teaching aids (M = 2.929) and the lack of valuable additional teaching material (M = 3.037). Other issues that need some improvement are the organisation of the module content (M = 3.927), time management (M = 3.951), and clarity with regard to the assessment criteria and tasks (M = 3.998).

Respondents' ratings on various aspects of the different modules were also investigated. The details are provided in Table 4.

Table 4

Average Rating on Various Aspects, per Module (Ranked)

Aspects / Modules	Content	Teaching and learning	Study material	Assess- ment	Combined
Understanding and managing the learner (module 5)	4.2897*	4.0793	3.7069	4.4414*	4.1276*
Becoming a reflective practitioner (module 6)	4.2286	4.1393*	3.7143*	4.2536	4.0857
Conducting and managing assessment (module 3)	4.2322	3.9966	3.6494	4.2023	4.0184
Curriculum interpretation and planning (module 4)	4.0913	3.8837	3.4511	4.0913	3.8804
Methodology: integrated teaching and assessment (module 2)	3.9106	3.8082	3.5235	3.9894	3.8059
The FET College: policy and workplace contexts (module 1)	3.7556#	3.6923#	3.3571#	3.8978#	3.6791#

*   *Highest score per aspect*

\#   *Lowest score per aspect*

Module 5 (Understanding and managing the learner) scored the highest overall (M = 4.1276), as well as on aspects pertaining to content (M = 4.2897) and assessment (M = 4.4414). The module with the second overall highest score (M = 4.0857) was module 6 (Workplace-based experience). Module 1 (The FET College: policy and workplace contexts) scored the lowest overall (M = 3.6791), as well as on each aspect that was explored in the survey. The module that scored the second-lowest overall was module 2 (Methodology: integrated teaching and assessment).

The statistical significance of the differences in mean scores was explored, using the one-way ANOVA. No statistically significant differences were found between the study materials' rating in the different modules. Statistically significant differences were found between the content (p = 0.0000), teaching and learning (p = 0.0004), and assessment (p = 0.0002) ratings in the different modules.

The Sheffé post-hoc test showed a number of statistical differences:

- The content of module 1 scored significantly lower than that of module 3 ($p = 0.000$), module 4 ($p = 0.025$), module 5 ($p = 0.008$), and module 6 ($p = 0.036$).
- The content of module 2 scored significantly lower than that of module 3 ($p = 0.049$).
- The teaching and learning aspects of module 1 scored statistically significantly lower than those of module 3 ($p = 0.037$) and module 6 ($p = 0.031$).
- The assessment during module 1 was rated significantly lower than that of module 5 ($p = 0.006$).
- The assessment during module 2 was rated significantly lower than that of module 5 ($p = 0.048$).
- The overall rating of module 1 is significantly lower than that of module 3 ($p = 0.006$), module 5 ($p = 0.015$), and module 6 ($p = 0.045$).

While none of the modules scored below the point of neutrality (i.e., 3) on any of the aspects, in terms of quality assurance, SOL's aim is, at least, to be good (a score of 4). While experiences pertaining to teaching and learning seem to be similar during the different modules, the content and assessment of module 1 and module 2 seems to need improvement, while these aspects of module 5 can be commended.

Whereas the evaluation during the first phase of the study focused on the various modules offered in the programme, and feedback obtained immediately after completion of the modules, the second phase of the study focused on the programme per se.

Results from the Second Phase of the Study

The questionnaire used during the second phase of the study contained mainly closed questions, in which the participants were requested to respond to statements on a 5-point Likert-scale (ranging from *strong disagreement* to *strong agreement*). As a score of 3 indicates neither a positive nor a negative response, and only 4 and 5 indicate an agreement, any mean score of less than 4 should raise concerns, in terms of the quality of the specific programme.

The survey was aimed at four specific categories of issues pertaining to the VEOP, namely 1) issues generic to all programmes (standards, administration, mode of presentation, etc.); 2) issues pertaining to the campus where the lecturer-students attend the programme (administration, presentation, etc.); 3) the purpose of the programme; and 4) the principles underpinning the programme. Furthermore, the respondents' general perceptions of the module that they experience the most positively, compared to the module that they experience most negatively, were obtained.

The combined score on all the items in the questionnaire is 3.975 (with a standard deviation of 0.777), just below the benchmark of good (i.e., 4.000). The participants'

scoring on the four constructs are summarised in Table 5 (ranked from highest to lowest).

Table 5

Categories of Issues Appraised in the Survey

	Mean M	SD s
The level to which the stated principles underpinning the programme was experienced by the participants.	4.0324*	0.7797
The extent to which the purpose and aim of the programme was achieved.	3.9722	0.9012
The level of satisfaction with the campus at which the programme is offered.	3.9444	0.7024
The level of satisfaction with generic issues pertaining to the programme.	3.9021#	0.8235

*   *Highest score*

Lowest score

From the responses, summarised in Table 5, it seems as if the principles that were stated indeed informed the programme (M = 4.0324), while the respondents were the least satisfied with generic issues pertaining to the programme (M = 3.9021). The details of these issues, on which the respondents were probed, are provided in Table 6.

Table 6

Details, Relating to the Issues, on which Participants were Probed (Ranked per Issue)

	Mean M	SD s
Generic issues		
The study material was of a good standard.	4.1875	0.8419
I am pleased that I did the VEOP course.	3.8958	1.2922
I was comfortable with the assessment activities that were used.	3.8542	0.9673
I am satisfied with the standard of the VEOP.	3.8125	1.0033
The administration of the VEOP at the UFS is good.	3.7872#	1.1021
Issues pertaining to the campus		
I am pleased with the way the course was presented.	4.0000	0.8251
I am positive about the tutors on the VEOP.	3.9375	0.9087
The administration of the VEOP at my campus is good.	3.8958	0.9944
Issues relating to the purpose and aims of the qualification		
I now have a better understanding of the processes of learning.	4.1042	0.9728
I am now better equipped to plan relevant learning activities.	4.0417	1.0097

	Mean M	SD s
I am now better prepared to plan relevant assessment activities.	4.0208	1.0617
The programme stimulated self-reflection.	4.0000	0.9676
I now have a basic understanding of how to use research towards improving my own practice.	4.0000	1.0719
The VEOP provided me with an understanding of the FET environment.	4.0000	1.0314
The VEOP gave me insight into FETC policies.	3.9792	1.0208
The course helped me to understand my students better.	3.9792	1.0816
The VEOP improved my ability to interpret the curriculum.	3.9167	1.0686
I am more able to use integrated teaching and assessment strategies than before I completed the programme.	3.8958	1.0766
My insight into the fostering of a culture of learning improved.	3.8750	1.1228
My management and administration skills improved.	3.8542	1.1667
Issues relating to the principles underpinning the programme		
I felt accepted and included during the course.	4.2083*	0.7978
The VEOP was relevant to my work.	4.1915	0.9921
During the course, I felt respected.	4.1042	0.9280
The assessment was relevant to my work situation.	4.0625	0.9087
I was able to apply the learning experience to the context of my subject specialisation.	4.0000	0.9225
I can apply what I have learned in my classroom.	3.9792	1.0617
I do apply what I have learned in my classroom.	3.9167	1.0280
My previous experience and expertise was acknowledged and appreciated.	3.8125	1.0650

*   *Highest score*

Lowest score

What was rated the highest by the respondents is that they felt accepted and included during the course (M = 4.2083), that they experienced the VEOP as relevant to their work (M = 4.1915), and that they perceived the study material to be of a good standard (M = 4.1875). Issues that scored the lowest were the administration of the VEOP at the UFS (M = 3.7872), the acknowledgement and appreciation of previous experience and expertise (M = 3.8125), and the standard of the VEOP (M = 3.8125). It should, however, be noted that while all of the aspects explored scored above the point of neutrality (i.e., 3), many scored below the standard of good (i.e., 4).

To complement the module evaluations done during the first phase of the study, the modules were evaluated holistically: The student-lecturers were asked to rate the modules in terms of the module they rated the highest and the lowest. The results are displayed in two graphs.
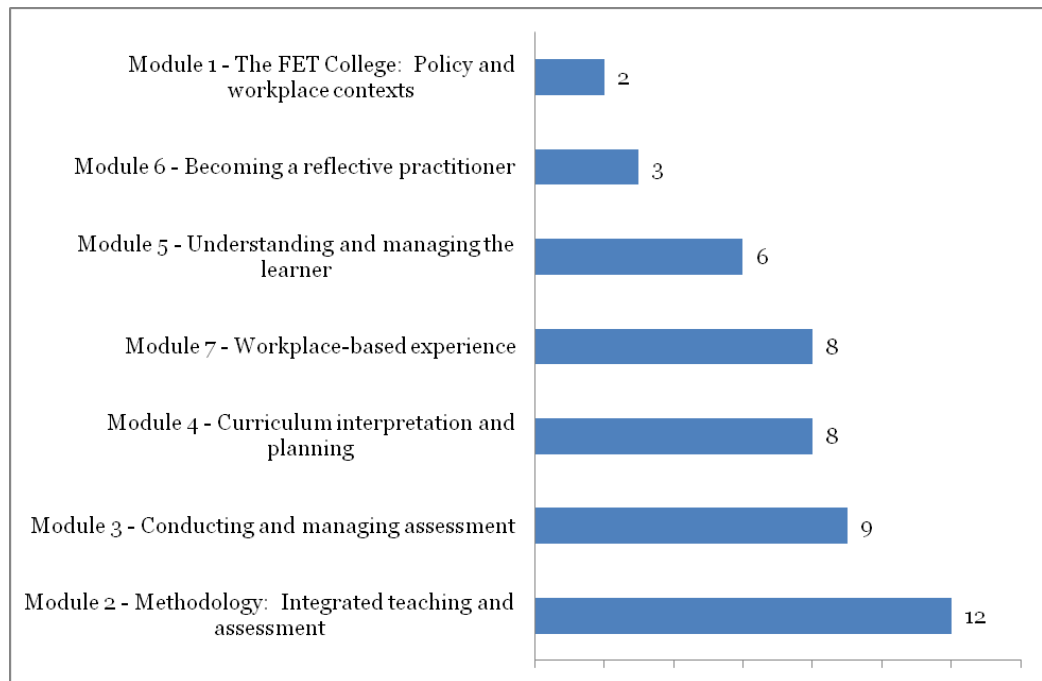
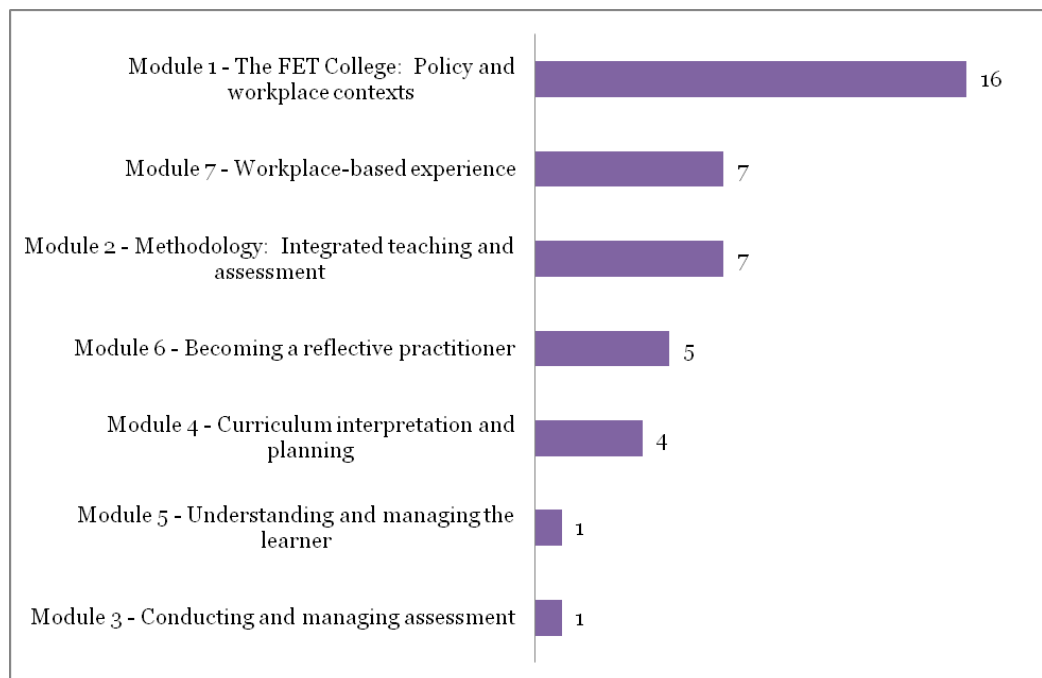*Figure 1.* Modules rated as the best by the participants.

Figure 2. Modules rated as the worst by the participants.

While different lecturer-students rated the modules differently, the one module that stands out as problematic is module 1. It was rated the lowest by the majority of the participants, and scored the highest by only two participants. Using the rank order of Figure 1 and inverting the rank order of Figure 2, and then combining the two rankings, the rating of the modules is as follows:

1. Conducting and managing assessment (module 3)
2. Curriculum interpretation and planning (module 4)
3. Methodology: integrated teaching and assessment (module 2)
4. Understanding and managing the learner (module 5)
5. Becoming a reflective practitioner (module 6)
6. Workplace-based experience (module 7)
7. The FET College: policy and workplace contexts (module 1)

While the students have different perspectives on which of the modules are the best, it is clear that module 1 is regarded as the module that needs the most improvement.

Discussion

The need for self appraisal in any programme is essential as it allows the institute offering the programme to reflect on the strengths and weaknesses of the programme. The insights gained in the process allow for improvement, growth, and development. This is even more important for any new programme and specifically a programme such as VEOP, where the training of FETC lecturers is not only a new field in Higher Education in South Africa, but still to be developed into a new complete qualification.

During the two-phase programme evaluation, a number of strengths emerged: During the evaluation of the different modules, the respondents were, in general, positive about the content of the various modules and indicated that they enhanced their knowledge. The respondents were furthermore satisfied with the assessment during the modules and specifically indicated that the assessment tasks were marked and returned within a reasonable time. From the responses of the participants in the programme evaluation survey, it seems as if the principles that were stated were experienced by the lecturer-students. The lecturer-students seem to appreciate the encouragement of the tutors towards student participation. What was rated the highest by the respondents is that they felt accepted and included during the course, that they experienced the VEOP relevant to their work, and that they perceived the study material to be of a good standard. These positives resonate well with ADEC's principles for good practice in distance education (cf. Buford, 2005).

However, not all experiences by lecturer-students were positive. A number of deficits in the programme became clear in this study. Lecturer-students indicated that tutors do not use teaching aids effectively. The additional learning material was indicated to be

insufficient, while the organisation of the module content needed some improvement. Module 1 (the FET college: policy and workplace contexts), as well as module 2 (Methodology: integrated teaching and assessment) were rated the lowest during the module evaluation. Some issues were specifically pointed out as needing improvement, namely the content of modules 1 and 2, as well as the assessment, teaching, and learning during module 1. In the final programme evaluation, module 1 was again indicated as the one module with which the students are not satisfied. Respondents indicated that time to achieve the different modules' outcomes was not enough. Issues that scored the lowest by the respondents in the second survey were the administration of the VEOP at the UFS, and the acknowledgement and appreciation of previous experience.

Respondents who believe that they do not have enough time to achieve the module outcomes (cf. Table 3) correspond with previous research. Mishra et al. (2009) also highlight distance learners' "acute shortage of time" (p. 114). They attribute this problem to the societal, familial, and personal commitments of distance learners. According to these authors, a frequently asked question concerns the number of hours they must study every day or in a week to successfully complete a programme in the minimum time, without compromising the quality of learning. This has, according to Mishra et al. (2009), implications for course design, development, and student workload.

Printed self-instructional materials and the contact-sessions form the backbone of instruction in the VEOP. Therefore, evaluating various aspects of the module content, teaching material, and teaching and learning were concerns (Tables 3 and 4). This study reveals that although the students were, as a whole, satisfied with the module content of the different modules (Table 3), they grappled with the content and study material of module 1 (Table 4). The importance of unambiguous and sufficient learning materials should therefore be highlighted (cf. Mishra et al., 2009; Sampson, 2003). Mishra et al. (2009) furthermore stress that learning material, especially if it is lengthy and/or dense, "do(es) not fully substitute for the teacher" (p. 115). Gültekin (2009) notes that it is important that study material for distance learning is designed in accordance with distance teaching techniques that facilitate learning and are easily comprehended. Student satisfaction with study material is not only a condition for successful distance education, but is fairly common in distance education. This study (Table 3), as well as programme evaluation studies by Mishra et al. (2009) and Gültekin (2009), found that students were satisfied with the design and content of the study material. On-site facilitators are critical to the effectiveness of a distance education programme (Sampson, 2003). It is therefore heartening that lecturer-students who took part in this study are relatively satisfied with the conduct of the tutors towards them, because the tutors encouraged them to participate in class, returned marked work within a reasonable time frame, and are positive about the tutors (cf. Tables 3 and 6).

Sampson (2003) finds that support is a key issue in distance education. Students who took part in Sampson's (2003) study on the needs of M.Ed. education students were almost unanimous in stating their level of dissatisfaction with the amount of support they received. The lecture-students who took part in this study were also critical of the

administrative support they received. They evaluated the administration of the programme at the UFS, as well as on their respective campuses, as below the standard of good (i.e., 4) (cf. Table 6). Sampson (2003) believes that better co-ordinated administrative procedures that will allow for more effective communication between students and the university can reduce distance education students' frustrations. Sampson (2003) cites Rumble (1992) who states that the key to successful management of distance education lies in planning, organisation, leadership, and control.

Conclusions and Recommendations

Module evaluation as a standard procedure by the SOL is a strong point as it enables constant evaluation towards addressing the shortfalls in modules. Creating opportunities for lecturer-students to give feedback on the programme in retrospect is considered a strength, as it allows the participants to reflect on how the programme has impacted on their performance at the FETC where they teach.

The value of a study such as this is that it may lead to programme improvement. It is clear that the SOL has to rethink the methodology employed in VEOP, and redesign modules' contents to better reflect the FETC sector, in order to appropriately train FETC lecturers. It is clear that the selection of tutors is crucial and that tutors should have a thorough understanding of the FETC milieu, as well as pedagogies suitable for FETC lecturers. It is furthermore recommended that the amount of work that is expected during the VEOP needs to be revised. Too much work was put into the programme that is, in reality, a short programme. As the VEOP will become part of the first year of a full new education qualification, these modules should just introduce students to these topics, and allow for expansion and progression in the modules that will be built on them. Accordingly, the amount of worked crammed into the course and the assignments given should be reconsidered. Most importantly, it is recommended that all modules have to be reviewed and partially or completely rewritten, informed by the insights gained through this study. VEOP is not a qualification, but a short course designed to be part of the new education qualification for FETC lecturers. It does not focus on vocational improvement, but, rather, on promoting teaching practices, as well as classroom and learner management of lecturers who train students for vocations. However, how it achieves the need to be enhanced in order to capture the nature and essence of the FETC sector more appropriately should be investigated. This study also highlighted the need to enhance student support and improve administration. Cognisance should therefore be taken of Sampson's (2003) guidelines on how to improve planning, organisation, leadership, and control in distance education.

The important role FET can play in economic and individual prosperity is acknowledged worldwide (Coates, 2009). This necessitates well qualified, knowledgeable FET lecturers. Whilst Williams (2010) is for example discussing the expansion and revision of FETC lecturers' qualifications in a highly developed country (Australia), South Africa

is still debating the development of a full qualification for FET lecturers. The study has revealed the strengths and weaknesses of the VEOP presented by the SOL, and showed that distance education is the only viable delivery mode for this short programme in a country with limited resources. Sub-Saharan Africa and other developing countries should thus consider using distance education as a workable option to enhance the competencies of their FET lecturers. Without a competent labour force developing countries will never be able to effectively compete in the global marketplace.

The following limitations of this study should be noted: The sample for this study was a single (the first) cohort of students registered for one VEOP programme. Results from this study can therefore not be generalised. The low response rate during the first phase of the study (27.2%) and the small sample size during the second phase of the study (only 48 of the first cohort of 256 lecturer-students [18.8%]) may also inhibit the generalisation of results. Key principles for the evaluation of distance education, such as the use of technology, as well as technical and library support for students, were not investigated (cf. Buford, 2005). We furthermore used two self-constructed questionnaires, which does not allow us to claim consistency of measurement over time. Despite these limitations, this study may inform the development of a full qualification for FETC lecturers. The FETC sector brings uniqueness to the education forum in the sense that it accommodates adolescent, youth, and adult learners. It also offers a rich mix of academic and vocation training that differs vastly from schools and universities. Any education and training effort in this field should take this uniqueness into consideration in its design, development, and offering, even more so when courses are designed and offered to the FETC lecturer cadre.

Acknowledgements

References

ADEA (Association for the Development of Education in Africa). (2002). *Distance education and open learning in sub-Saharan Africa.*

Aluko, R. (2009). The impact of an Advanced Certificate in Education (ACE) Program on the professional practice of graduates. *International Review of Research in Open and Distance Learning, 10*(4), 1-25.

Akoojee, S. (2008). FET college lecturers: The 'devolving' link in the South African skills development equation. *Journal of Vocational Education and Training, 60*(3), 297-313.

Buford, J. (2005). An introduction into designing and delivering courses and programs at a distance. In K. E. Dooley, J. R. Lindner & L. M. Dooley (Eds.), *Advanced methods in distance education* (pp. 1-30). Hershey: Information Science Publishing.

Coates, H. (2009). Building quality foundations: Indicators and instruments to measure the quality of vocational education and training. *Journal of Vocational Education and Training, 61*(4), 517-543.

Cosser, M., Kraak, A. & Winnaar, L. (2011). *Further education and training (FET) colleges at a glance in 2010.* Pretoria, South Africa: HSRC.

Council on Higher Education (CHE): Higher Education Quality Committee (HEQC). (2005). National review of the Master of Education programmes manual. *CHE online.* Retrieved from http://www.che.ac.za.

DHET (Department of Higher Education and Training). (2009). *The national policy framework for lecturer qualifications and development in FET colleges in South Africa.* Pretoria, South Africa: Government Press.

DHET (Department of Higher Education and Training). (2012a). *Green paper on post-school education and training.* Pretoria, South Africa: Government Press.

DHET (Department of Higher Education and Training). (2012b). *Policy on professional qualification for Further Education and Training Colleges.* Pretoria, South Africa: Government Press.

Financial Mail. (2013). *More funding for Setas and FETS.* Retrieved from http://www.fm.co.za/economy/2013/01/23/more-funding-for-setas-and-fets.

Gültekin, M. (2009). Quality of distance education in Turkey: Preschool teachers training case. *International Review of Research in Open and Distance Learning, 10*(2), 1-24.

Mishra, A., Vijayshri, V. & Garg, S. (2009). Evaluation of the undergraduate physics programme at Indira Gandhi National Open University: A case study. *International Review of Research in Open and Distance Learning, 10*(6), 106-123.

Nkosi, B. (2012). KZN students' discontent just the tip of the iceberg. *Mail & Guardian online*. Retrieved from http://mg.co.za/print/2012-06-09-kzn-students-discontent-just-the-tip-of -the iceberg .

Papier, J. (2010a). From policy to curriculum in South African vocational teacher education: A comparative perspective. *Journal of Vocational Education and Training, 62*(2), 153-162.

Papier, J. (2010b). Policy delay leaves colleges in lurch. *Mail & Guardian online*. Retrieved from http://mg.co.za/article/2010-09-17-policy-delay-leaves-colleges-in-lurch.

Powell, L. (2012) Reimagining the purpose of VET – expanding the capacity to aspire in South African Further Education and Training students. *International Journal of Educational Development, 32*, 643-653.

Perraton, H. (2007). *Open and distance learing in the developing world* (2nd ed.). London, England: Routledge.

Sampong, K. A. (2009). An evaluative study of distance teacher education in a university in Ghana. *International Review of Research in Open and Distance Learning*, *10*(4), 1-25.

Sampson, N. (2003). Meeting the needs of distance learners. *Language, Learning & Technology, 7*(3), 103-118.

Sikwibele, A. L., & Mungoo, J. K. (2009). Distance learning and teacher education in Botswana: Opportunities and challenges. *International Review of Research in Open and Distance Learning*, *10*(4), 1-16.

Taylor-Powell, E., & Renner, M. (2000). *Collecting evaluation data: End-of-session questionnaires*. Madison, Wisconsin: University of Wisconsin-Extension.

Williams, K. M. (2010). Examining education qualifications for vocational education practitioners. *Journal of Vocational Education & Training, 62*(2), 183-194.

Wilson, T. (2008). New ways of mediating learning: Investigating the implications of adopting open education resources for tertiary education at an institution in the United Kingdom as compared to one in South Africa. *International Review of Research in Open and Distance Learning, 9(1), 1-19.*

Zawacki-Richter, O. (2009). Research areas in distance education: A Delphi study. *International Review of Research in Open and Distance Learning, 10*(3), 1-17.

Athabasca University

Measuring Use and Creation of Open Educational Resources in Higher Education

Ross McKerlich[1], **Cindy Ives**[2], and **Rory McGreal**[2]
[1]Okanagan College, Canada, [2]Athabasca University, Canada

Abstract

The open educational resources initiative has been underway for over a decade now and higher education institutions are slowly adopting open educational resources (OER). The use and creation of OER are important aspects of adoption and both are needed for the benefits of OER to be fully realized. Based on the results of a survey developed to measure the readiness of faculty and staff to adopt OER, this paper focuses on the measurement of OER use and creation, and identifies factors to increase both. The survey was administered in September 2012 to faculty and staff of Athabasca University, Canada's open university. The results offer a snapshot of OER use and creation at one university. The survey tool could provide a mechanism to compare and contrast OER adoption with other higher education institutions. Forty-three percent of those in the sample are using OER and 31% are creating OER. This ratio of *use* to *creation* is introduced as a possible metric to measure adoption.

Keywords: Open educational resources; OER; open textbooks; open learning

Introduction

Open educational resources (OER) can be defined as "materials used to support education that may be freely accessed, reused, modified and shared by anyone" (Downes, 2011). Open educational resources are still in the early adoption stage; the genesis of OER was the open source computing movement (Brown & Adler, 2008) and its first application to learning was "learning objects." Wiley tackled the definition of learning objects in 2000 and offered the following: "any digital resource that can be reused to support learning" (2000, p. 4). Compare this to Downes' 2011 definition of open educational resources above and indeed they have similarities: Wiley (2000) suggested the critical attributes of learning objects are "reusable", "digital", and "resource". Downes (2011) included these attributes in his definition of OER – although digital is not mentioned it could be construed as implied in this digital age. Thus the term "learning object" could be considered a formative definition preceding OER.

Types of OER include lessons, modules, full courses/programmes, guides, e-texts, articles, audio tracks, videos, multimedia, and any other learning materials (UNESCO & Commonwealth of Learning, 2011; Hylen, 2007). One of the main purposes for OER is to support education; they do so with heightened accessibility and they have the potential to reduce barriers to learning through enhanced attention, motivation, and engagement of students (Sclater, 2010).

Open textbooks are one type of OER initiative that has gained attention recently with several governments, such as the state of Washington (Overland, 2011) and the state of California (Volmer, 2012), investing millions of dollars in the development of these resources for use by community college students. The province of British Columbia has also announced funding for 40 open textbooks (Government of BC, 2012). These bold actions can reduce the financial barriers to education for many; a recent report from the center for Public Interest Research found that using open textbooks could reduce student costs by 80% (Allen & PIRG, 2010).

The above examples of policy changes at the government level may minimize some of the barriers to adopting OER, but several more exist. Nie (2012) noted multimedia skills, knowledge of copyright law and licensing practices, and search ability as barriers. There are many good repositories but not knowing where to look constitutes a barrier for time-challenged faculty and staff. As the OER movement is worldwide there are cultural differences as well (Nie, 2012). Murphy (2012) notes time, organizational culture, and availability of resources as being significant barriers. De Liddo (2010) confirms this higher education cultural barrier of "opening up" and suggests technology aimed at connecting and collaborating could minimize this. One of the main issues that inhibits sharing and openness in higher education is intellectual property. Organizations such as Creative Commons preserve the rights of the authors by providing a variety of licences that allow them to choose the conditions for sharing their work. Their mission is to "develop, support and steward legal and technical

infrastructure that maximizes digital creativity, sharing and innovation" (creativecommons.org/about).

Downes (2007) noted that OER production is largely voluntary and motivation is altruistic. He pointed to two human characteristics of the community OER approach: Human interaction is needed to build OER; and the users of OER must be respected (Foote as cited in Downes, 2007). Pawlowski (2012) suggested that one factor which could further the adoption of OER is increased emotional ownership, defined as "the degree that individuals perceive that knowledge or resources belong to them" (Clements & Pawlowski, 2012). While this view could be seen as antithetical to the community OER approach outlined by Downes (2007), in fact, because of altruistic motivation for creating OER, emotional ownership strengthens the community. Emotional ownership, in concert with organizations such as Creative Commons, could also contribute to opening up the private practice of teaching and scholarship in higher education institutions. Pawlowski (2012) outlined a four-phase collaborative development cycle for OER:

Design & Develop $\Rightarrow$ Redesign $\Rightarrow$ Reuse $\Rightarrow$ Republish

In this cycle, emotional ownership can increase as reuse and republishing occur in their respective communities (Pawlowski, 2012). Pawlowski concluded that OER collaborators must be encouraged, engaged, and supported throughout the OER development process (Pawlowski, 2012).

The key issue this research project addressed was measuring the health of the Athabasca University OER collaborative development cycle. Using OER is an indicator of adoption, but creating OER and adding back to the community are key to broader adoption and sustainability, both within the community and beyond.

Our goal was to determine how our institution is adopting OER so that insights could be made about how to further adopt, develop policy, and recognize the commitment of our community. Surveys have been created recently such as Murphy (2012), Open Access Textbook Project (2010), Petrides et al. (2010), The OER Impact study (White & Manton, 2011), and the UK-OER Synthesis and Evaluation Project (McGill et al., 2013) to measure key factors in OER adoption, and our survey is designed to be a reusable instrument which can be easily administered to determine OER adoption progress. Our survey is different from Murphy's (2012) benchmark study, which has a considerable policy focus. While our pilot was offered specifically at an open university, our intention was to provide a valuable tool to measure the use and creation of OER in any institution.

This research focused on the following questions:

- Are faculty and staff in the sample using OER?

- What type of OER have faculty used?

- What factors could facilitate using OER?

- Are faculty and staff creating OER?

- What type of OER are faculty and staff creating?

- What factors could facilitate creating OER?

Method

To answer the above research questions, a quantitative survey was developed to measure the use of, creation of, and attitudes toward OER in our institution. The survey was based on the *Open Access Textbook Task Force Final Report* (OATTFF) (2010) and adapted with permission (I. Cook, personal communication, October 23rd, 2011). The data collected in the survey were used to fulfill Florida Statute 1004.091 (2), which provided a legislative mandate to research key factors of a publicly funded open textbook model (Open Access Textbook Taskforce, 2010). Now with a new name, the Florida Virtual Campus has emerged to be a leader in the field and is helping other states adopt open textbooks based on their findings (Florida Virtual Campus, 2012). The survey questions were well designed to measure the use of, creation of, and attitudes toward using open textbooks, a specific type of OER. To expand the breadth of the survey and create a valuable tool to measure adoption of OER, we added questions to ascertain what type of OER were being used or created, and other refinements were made to obtain information that would help clarify the state of adoption of OER in general. A conditional question was included in the Use section of the survey: If the participant answered "no" to the OER Use question they were taken directly to the Attitude section of the survey. A copy of the OER Readiness Survey tool is available from Athabasca University's digital repository [AU Space](#).

The sample was composed of academic, professional, and administrative staff at Athabasca University. Thirty-four percent were faculty and 14% were tutors, while 11% were members of a course development team. Two percent identified themselves as administrators. Areas of responsibility were quite evenly split between general studies (39%), upper division courses (32%), and graduate courses (31%). The survey was anonymous and open to all staff. The all staff email also served as part of an awareness-raising strategy.

The total number of AU staff and faculty who could have seen the invitation to complete the survey was approximately 1,300. The respondent sample size was 154 responses with 90 complete responses. This is a very low response rate, however it is unlikely that administrative staff with no connection to course development or delivery would have responded. The number of faculty and course development staff is approximately 200. It's difficult to calculate a margin of sampling error.

Both complete and incomplete responses were included in the analysis because the incomplete responses could have been a result of question design. For example, *not applicable* was not an option on some of the questions and it was possible that respondents did not have enough information or knowledge to answer the questions completely. Using incomplete responses also allowed us to determine how much awareness there was among staff at the time of the survey, and to infer where there were gaps in knowledge about OER.

In the presentation of findings below, the sample size is noted for each result. Data were collected for 10 days and did not include any incentive. There was one reminder a week after the initial invitation. There were 22 questions in the anonymous survey and all questions were non-mandatory. Downe's definition of OER (2011) was used in the invitation to participate as well as in the survey when asking about use and creation of OER.

Description of the Sample

Table 1

Position Summary, N = 105

Role	Count	%
Full time faculty member	53	34
Tutor	22	14
Member of course development team	11	7
Other	11	7
Production staff member	4	2
Administrator	4	2

Table 2

Familiarity with OER, N = 109

Answer	Count	%
Somewhat familiar	65	59
Very familiar	25	22
Not at all familiar	11	10
No answer	8	7

Results

Research Question 1: Are Faculty And Staff Using OER?

Table 3

OER Use in Courses, N = 109

Answer	Count	%
Yes	45	41
No	41	37
No answer	23	21

Research Question 2: What OER Are Faculty and Staff Using?

The survey asked participants how likely they were to use 13 different types of OER. The sample size for this question was 90. When "Very Likely and "Somewhat Likely" responses were added together to indicate inclination, the following OER were revealed to be strong candidates in terms of use.

Table 4

Types of OER Used, N = 90

Type of OER	Combined %	Count
Scholarly journal access	72	65
Video	68	62
Images	65	59
Textbooks	65	59
Audio	62	56

Research Question 3: What Factors Would Increase Use of OER?

The survey asked participants how important nine different factors were to use OER. The sample size for this question was 90. When "Very Likely and "Somewhat Likely" responses were added together to indicate inclination, the results are as follows (most important to least important).

Table 5

Factors to Increase Use of OER, N = 90

Factor	Combined %	Count
Academic quality	87	78
Time to find, review, select	82	74
Knowledge about OER	78	70
Desire to reduce costs for students	74	67
Hardware /software to facilitate use	74	67
Environmental concerns	68	61
Support from administration	67	60
Course team support	66	59
Recognition	57	51

Research Question 4: Are Faculty and Staff Creating OER?

Table 6

OER Creation by Faculty and Staff, N = 154

Answer	Count	%
Yes	44	29
No	110	72

Research Question 5: What Types of OER Are Faculty Creating?

The survey asked participants if they were creating any of 13 different types of OER. The sample size for this question was 90. When "Very Likely and "Somewhat Likely" responses were added together to indicate inclination, the following OER were the most popular resources being created.

Table 7

Types of OER Being Created, N = 90

Type	Count	%
Tutorials	21	23
Quiz	17	19
Audio	14	16
Video	14	16
Images	13	14
Group of lessons	13	14
Textbooks	10	11
Scenarios case studies	9	10
Software	8	8
Other	8	8
Game	7	7
Animation	6	7
Maps	4	4

Research Question 6: What Factors Would Increase Creation of OER?

Table 8

Factors to Increase Creation of OER, N = 70

Factor	Combined %	Count
Academic quality	74	67
Course team support	73	66
Knowledge about OER	72	65
Hardware /software	72	65
Support from administration	71	64
Time to review /select	71	64
Desire to reduce costs to students	67	60
Environmental concerns	67	60
Recognition	63	57

Discussion

Murphy (2012) noted that there is value in benchmarking, and the survey created for this research could serve as a standardized tool to collect benchmarking data about OER in any educational institution. While the survey could be further adapted to meet an institution's specific needs, there is value in a standard measurement tool. The samples in Murphy's study were from participating members of the recently launched OER

University; Athabasca University is one of the charter member universities. Together, a top-line benchmark could be drawn. In this sample, the vast majority of the participants knew about OER: 82% were either very familiar or somewhat familiar. The familiarity level might not be as high if a similar survey were to be given at another institution that was not focused on openness, but the data from a standard measurement tool could still be compared and contrasted.

The OER Readiness Survey could also be used as an awareness tool. The survey findings were shared with two different groups in spring of 2013 and each presentation generated significant discussion among those who attended. In addition to generating OER awareness, the OER Readiness Survey can be used to identify learning needs; the final questions in the survey ask for respondents' interest in learning about six key areas in OER and how they would like to learn more about these topics.

It is interesting to note that despite the recent government support of open textbooks as described above, textbooks were fourth on the list in terms of being used and seventh in terms of OER being created. These numbers will likely change as policies and procedures are put in place from the legislative level. Overall, the use and creation results are encouraging: 41% of the sample indicated they *use* OER while 37% *create* OER. There is still some progress to be made in terms of *use* and *creation* but we do have an indication of what factors would increase these measures.

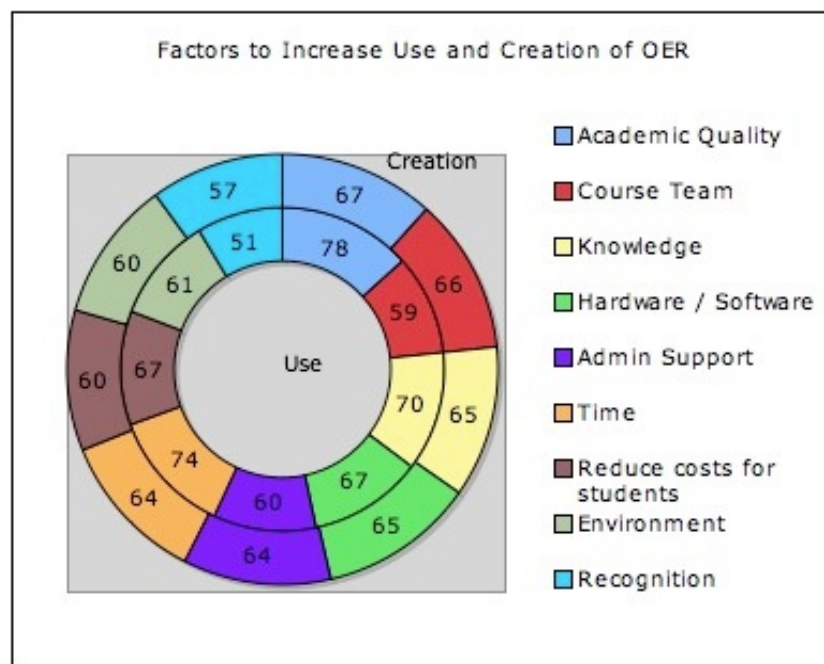There is some overlap in the factors for both using and creating OER as displayed in Figure 1.

Figure 1. Factors to increase use and creation of OER.

The numbers above are the counts from Table 5 (factors to increase use – inside circle) and Table 8 (factors to increase creation of OER – outside circle). Surprisingly, recognition is the lowest factor for both OER creation and use factors. This could suggest that intrinsic motivation drives faculty and staff who use and create OER. It could also suggest that AU faculty aren't used to recognition so don't expect it and aren't driven by recognition. This interpretation may still be evidence of intrinsic motivation.

This evidence of intrinsic motivation aligns with Pawlowski's emotional ownership model (2012) of OER creation and use. Academic quality is the highest factor for both use and creation and this also has to do with emotional investment. The participants were all involved in designing learning, and they want their students to succeed. Knowledge of OER is also high on the list for both creation and use. This could be because in the higher education environment, there is an intrinsic component to acquiring new knowledge.

Daniel (2011) described OER work as "patchy". He wrote that until the focus of OER is on "production" instead of "reuse" it could not be considered a mainstream adoption (Daniel, 2011). Therefore, a ratio of use to creation could be a useful metric to measure adoption of OER. Downes (2006), Daniel (2011), and Pawlowski (2012) all emphasize the importance of creating as well as using OER. The OER adoption ratio for this research project would be 39 (use) to 28 (creation) based on a sample of 90 complete responses. Presented as percentages of the total sample, the ratio would be 43:31. Further research could be done to determine what exactly is the best ratio. Is it when both are equal? Is a ratio an accurate representation of adoption? This notion could be further developed after more institutions use the survey tool to obtain OER adoption data.

Possible limitations to the study include self selection: Faculty and staff at Athabasca University could be naturally interested in OER and feel confident in their knowledge in this area and may be early adopters of educational innovations. There could also be possible differences between the groups represented in the sample resulting in overlapping data if a team selects course resources. For example, if a course developer and tutor were both involved in the decision, both would report that they use OER. As noted above, 2% of the sample – or four people – identified themselves as administrators such as chair, coordinator, dean, or other. In any higher education institution, decision makers exist at all levels, and faculty especially contribute to policy, procedure, and practice decisions. In the collegial context that is one of the hallmarks of universities, consultation with stakeholders is a critical component of any strategic planning initiative for change. Finding out what users/creators of OER (faculty, designers, etc.) need in order to make their use/creation successful is an essential part of managing the course development process. Finally, OER are digital by nature and digitally literate respondents might be more inclined to answer the survey questions, indicating an overrepresentation on the use and creation side. While these are limitations, they do not negate the value of having identified the benchmark.

A large amount of data was collected with this survey; in the interest of focus we decided to concentrate on descriptive statistics of use and creation of OER. Further research could explore the data in greater detail and correlation could reveal further salient results. To track progression in adopting OER and identify trends it would be valuable to re-offer the survey at regular intervals. As there are many stakeholders in OER adoption such as decision makers and students (White & Manton, 2011) a "360" type of survey might make the results multi-dimensional.

Conclusion

At Athabasca University, OER are being both used and created and the motivation for both seems largely intrinsic. The data collected from the OER Readiness Survey tool concurs with Pawslowski (2012) that creating OER leads to higher emotional engagement than simply using OER. If use and creation do add emotional ownership and reduce a barrier of non-attachment to shared resources, then a ratio of use:creation could be useful for measuring OER adoption at an institution. The small gap between OER use and OER creation could be a possible indicator of healthy adoption of OER.

Because of the intrinsic nature of using and creating OER, institutional policy on OER should focus on encouragement, engagement, and support throughout the OER process (Pawslowski, 2012). This means implementing a pro-OER policy making use of available OER whenever possible, conducting searches for OER before considering commercial resources, and supporting a pro-OER environment within the institution. Further, it could mean changing the perspective of course development teams from course building to course assembly, thereby including course assembly as part of the "creative" course development process.

This tool was piloted at Athabasca University and the authors' intentions were to provide a useful tool to further the adoption of OER at other institutions. They could use the survey tool developed for this research so that use and creation of OER can be measured and benchmarks identified. After time and effort are invested in training staff and faculty how to find, evaluate, adapt, and integrate OER in their course development projects, the survey could be offered again to determine if there are increases in awareness, use, and creation and differences in the relationships among factors affecting use and creation. The survey tool and related data will contribute to consistent adoption of OER in the higher education community and students, teachers, and society, as a whole, will benefit.

References

Allen, N., & PIRG, S. (2010). A cover to cover solution: How open textbooks are the path to textbook affordability. *Student PIRGs.*

Brown, J. S., & Adler, R. P. (2008). Open education, the long tail, and learning 2.0. *Educause Review*, *43*(1), 16-20.

Clements, K. I., & Pawlowski, J. M. (2012). User-oriented quality for OER: Understanding teachers' views on re-use, quality, and trust. *Journal of Computer Assisted Learning, 28, 1* 4-14.

Daniel, J. (2011, May 9th). Open educational resources (OER): Switching focus from production to re-use? [Weblog comment]. Retrieved from http://www.col.org/blog/Lists/Posts/Post.aspx?ID=140

De Liddo, A. (2010). From open content to open thinking. In *World Conference on Educational Multimedia, Hypermedia and Telecommunications* (Ed-Media 2010). Toronto, Canada.

Downes, S. (2011, July 14th). Open educational resources: A definition [Weblog comment]. Retrieved from http://halfanhour.blogspot.com/2011/07/open-educational-resources-definition.html

Downes, S. (2006). Models for sustainable open educational resources. National Research Council Canada. Retrieved from http://www.oecd.org/document/32/0,2340,en_2649_33723_36224352_1_1_1_1,00.html

Downes, S. (2007). Models for sustainable open educational resources. *Interdisciplinary Journal of Knowledge and Learning Objects*, 3, 29-44. Retrieved from ijello.org/Volume3/IJKLOv3p029-044Downes.pdf

Government of British Columbia. (2012). BC to lead Canada in offering students free, open textbooks [Press Release]. Retrieved from http://www2.news.gov.bc.ca/news_releases_2009-2013/2012AEIT0010-001581.htm

Hylen, J. (2007). Giving knowledge for free: The emergence of open educational resources.   Retrieved from http://www.oecd.org/dataoecd/35/7/38654317.pdf

McGill, L., Falconer, I., Littlejohn, A., & Beetham, H. (2013, February). *JISC/HE Academy OER Programme: Phase 3 synthesis and evaluation report*. JISC. Retrieved from https://oersynth.pbworks.com/w/page/59707964/ukoer3FinalSynthesisReport

Murphy, A. (2012). *Benchmarking OER use and assessment in higher education*. University of Southern Queensland, Toowoomba, Australia.

Nie, M. (2012). *EVOL-OER: The evolution of OER. SCORE Fellowship final report*. University of Leicester, Leicester, UK.

Overland, M. (2011, January 9). State of Washington to offer online materials as texts. *Chronicle of Higher Education*. Retrieved from http://chronicle.com/article/State-of-Washington-to-Offer/125887/

Open Access Textbook Task Force. (2010). *Final report.* State of Florida, Tallahassee, USA.

Pawlowski, J. M. (2012, September). Emotional ownership as the key to OER adoption: From sharing products and resources to sharing ideas and commitment across borders. *EFQUEL Innovation Forum*.

Petrides, L., Jimes, C., Middleton-Detzner, C., & Howell, H. (2010). OER as a model for enhanced teaching and learning. In *Open Ed 2010 Proceedings*. Barcelona: UOC, OU, BYU. Retrieved from http://hdl.handle.net/10609/4995

Sclater, N. (2010). Open educational resources: Motivations, logistics and sustainability. In N. F. Ferrer & J. M. Alonso (Eds.), *Content management for e-learning*. Retrieved from http://sclater.com/papers/OER-Motivations-Logistics-and-Sustainability-Sclater.pdf

Volmer, T. (2012, September 27). California passes groundbreaking open textbook legislation [Weblog comment]. Retrieved from http://creativecommons.org/tag/california

UNESCO, Commonwealth of Learning. (2011). *Guidelines for open educational resources (OER) in higher education.* Retrieved from http://www.col.org/resources/publications/Pages/detail.aspx?PID=364

White, D., & Manton, M. (2011). *JISC-funded OER impact study*. University of Oxford.

Wiley, D. A. (2000). Connecting learning objects to instructional design theory: A definition, a metaphor, and taxonomy. In D. A. Wiley (Ed.), *Learning technology*. Association for Instructional Technology & Association for Educational Communications and Technology. Retrieved from http://reusability.org/read/chapters/wiley.doc

Athabasca University

Comparison of Course Completion and Student Performance through Online and Traditional Courses

Wayne Atchley[1], **Gary Wingenbach**[2], and **Cindy Akers**[3]
[1]Tarleton State University, USA, [2]Texas A&M University, USA, [3]Texas Tech University, USA

Abstract

Enrollment in online courses has outpaced overall university enrollment for the past several years. The growth of online courses does not appear to be slowing. The purpose of this study was to compare course completion and student academic performance between online and traditional courses. Archival data from the host university student records system was collected using the Structured Query Language. Descriptive statistics were used to analyze student characteristics. Chi-square analysis was used to determine if statistically significant differences existed between students enrolled in online and traditional courses when comparing course completion and academic performance. Analysis found statistically significant differences existed in both course completion and academic performance for students enrolled in online versus traditional courses. Additional analysis indicated statistically significant differences existed in course completion by course discipline.

Keywords: Online education; student performance; student retention

Introduction

In the fall of 2007, more than 17.9 million students were enrolled in degree-granting, postsecondary institutions. Of those students, more than 3.9 million were enrolled in one or more online courses. Online enrollments represented 21.9% of total enrollments. From fall 2002 to fall 2007, online enrollments grew at a compound annual growth rate of 19.7% from 1.6 million to more than 3.9 million (Allen & Seaman, 2008). With the growth of online course enrollments, questions have been asked about course completion and student performance in online courses compared to traditional, face-to-face courses.

Russel (2001) compiled an annotated bibliography of 355 research reports that examined differences in student outcomes between online and traditional courses. The majority of research revealed no statistically significant difference in student outcomes based on delivery mode. However, recent research on course completion and performance has been inconsistent. Brady (2001), Carr (2000), and Simpson (2003) found that course completion was generally lower in online courses when compared to traditional courses. Roach (2002) found that some institutions reported equal or higher course completion rates in online courses when compared to traditional courses. The problem this research will address is that further evidence is needed regarding student success measures in online instruction as opposed to classroom delivery.

Growth in online course enrollments is clear and many researchers agree that the future of higher education is tied to some form of online course delivery (Berger & Lyon, 2005; Harasim, 2000; Palloff & Pratt, 2003). Are course completion rates significantly different between online and traditional courses? Is a student's academic performance independent of the course delivery method? These questions are important to administrators tasked with maintaining the competitive and economic future of their respective universities and are the focus of this research.

Formula Funding

Texas public universities receive flexible, discretionary state funds based primarily on the formula funding calculation under the direction of the Texas Higher Education Coordinating Board (THECB). Of all the funds appropriated directly to Texas public universities, more than 62% comes from formula funding. The primary source of formula funding is generated by the instruction and operations formula. This formula is based on semester credit hours applied to a cost matrix identifying weights based on level of instruction (lower division, upper division, master, doctoral, or professional) and discipline (liberal arts, science, fine arts, etc.). The other formulas, Teaching Experience, Small Institution Supplement, and Infrastructure, also include semester credit hours, but total less than 25% of formula funding for most universities (THECB, 2008). Current formula funding is based on the 12th day of class enrollments and does not take into account students who drop courses during the semester.

In the state of Texas, course completion rates have become important with regards to funding. The THECB recommended a shift in formula funding for the 2010-2011 biennium. The proposal would change the funding formula from using attempted to completed semester credit hours (THECB, 2008). With the continued growth of online education and the proposed shift in funding, course completion rates in online courses became increasingly important to administrators at Texas public universities.

Another State of Texas rule for public university funding related to the number of times a student can repeat a course, commonly referred to as the "Three-Peat" rule (Texas Administrative Code [TAC], Title 19, Part 1, Rule 13.105, 2005). This rule has an impact on the student and university. The three-peat rule states that "Institutions shall not submit for formula funding any hours for a course that is the same or substantially similar to a course that the student previously attempted for two or more times at the same institution" ([TAC], Title 19, Part 1, Rule 13.105, 2005). In order for the university to compensate for the loss of funding, the student can be charged full out-of-state tuition cost for any course impacted by the three-peat rule. The three-peat rule increased the importance of student academic performance to avoid potential loss of state funding for the course and possible increased financial burden on the student.

Course Completion

Research on course completion rates between online and traditional course delivery has been mixed (Carr, 2000). Several studies showed differences existed in course completion rates between online courses and traditional, face-to-face courses (McLaren, 2004; Paden, 2006; Roach, 2002). Waschull (2001) found that online course completion rates were not significantly different from traditional course completion rates. Nelson (2006) compared course completion rates between online and traditional courses at Delaware Technical and Community College, Terry Campus. Her research found statistically significant differences in the course completion rates between online and traditional courses. Additional analysis showed that more students (23%) withdrew from the online courses compared to the withdrawal rate in traditional courses (18.4%).

Carr (2000) noted that some universities reported drop-out rates as high as 80% in online courses, but argued that course completion rates should not be compared across universities since universities report course completion rates differently. Some universities included students who dropped during the add/drop period while other universities did not report those instances. Without having a standard rule, a comparison across universities might not produce accurate results. Regardless of the ability to compare across universities, research into course completion rates is useful to university administrators tasked with determining class size and number of sections as well as those administrators responsible for assessing student learning outcomes for internal and external agencies (McLaren, 2004).

Student Performance

Russell (2001) explored 355 research reports comparing student outcomes between different course delivery modes. The majority of the research indicated no statistically significant differences existed in student outcomes based on delivery mode. Clark (1994) stated that it was the teaching methods and not the delivery medium used that influenced learning. In all cases, Clark argued that the selection of course delivery mode should be an economic decision (1994).

Much research exists supporting Russell's (2001) work (Clark, 1994; Gagne & Shepherd, 2001; McLaren, 2004). However, several studies have found statistically significant differences in student outcomes based on delivery type (Faux & Black-Hughes, 2000; Paden, 2006; Shoenfeld-Tacher, McConnel, & Graham, 2001). Paden found a statistically significant difference in student performance between online and traditional courses. Faux and Black-Hughes conducted research into student performance between different delivery modes of a social work course and found that a statistically significant difference existed between post-test scores by delivery mode. Additional analysis indicated that students in the online section did not perform as well as students in the traditional section.

Course Completion by Discipline

Several researchers found that certain disciplines were not suited for an online setting (Carnevale, 2003; Nelson, 2006; Noble, 2004; Paden, 2006; Smith, Heindel, & Torres-Ayala, 2008). Lab science, health care (Carnevale, 2003), and mathematics (Smith et al., 2008) courses have all been identified as course disciplines that are not well-suited for online course delivery. Terry (2001) suggested that courses such as accounting, economics, computer information systems, marketing, and management were potentially more conducive to online course delivery.

Smith et al. (2008) compared attrition rates between mathematics-related courses and non mathematics-related courses and found higher attrition rates in the mathematics-related courses. Attrition in traditional mathematics-related courses was the same as the drop-out rates in non mathematics-related courses. The researchers suggested that "for online students, mathematics is not working as well as other disciplines online, and further, students' difficulties with mathematics relative to other disciplines are not as great as in the face-to-face modality" (p. 152).

Online course delivery has been a growing area in higher education (Allen & Seaman, 2008). As universities continue to transition courses to online delivery, it is important to understand the impact on student performance and retention. Is student performance in online courses comparable to performance in traditional courses? Are there differences in course completion in online courses when compared to traditional courses? Are some disciplines more appropriate for online delivery?

Purpose and Objectives

The purpose of the study was to compare course completion rates and student performance between online and traditional courses. The following research objectives were used to guide the study:

1. Determine if there was a statistically significant difference in the performance of students enrolled in online courses compared to students enrolled in traditional courses.

2. Determine if there was a statistically significant difference in the retention of students enrolled in online courses compared to students enrolled in traditional courses.

3. Determine if there was a statistically significant difference in the retention of students enrolled in online courses by course discipline.

Methodology

This study had a causal-comparative research design, using archival data for students enrolled at a small, regional, public, comprehensive university located in the southwest United States.   Archival data was used to compare both course completion and student academic performance (measured by final course grade) between groups of students in online and traditional courses.   This same approach was used to compare course completion of students enrolled in online courses by course discipline.

Causal-comparative designs do not allow for explicit finding of causation (Fraenkel & Wallen, 2006), but do strongly suggest whether mode of instruction had a direct impact on student retention. Additionally, since causal-comparative design takes place after data were collected and without any manipulation or intervention, it allowed for the exploration of naturally occurring relationships between groups.

The population (N = 319,153) for this research was student course experiences for students enrolled in all 16-week courses taught between fall 2004 and spring 2009. Summer semesters were excluded as they are not comparable in structure or design to a fall or spring course (Nelson, 2006). Online courses as defined by Allen and Seaman (2008) were those courses "in which at least 80 percent of the course content is delivered online" (p. 4). For the purpose of this research, online courses were defined as those courses designated in the target university's student records system with an online building designation. Traditional courses were defined by Allen and Seaman (2008) as courses "with no online technology used – content is delivered in writing or orally" (p. 4). For the purpose of this research, traditional courses were defined as those courses designated in the student records system with a building code other than online and with an instruction code of "lecture."

For objective one, a purposive sample was selected that consisted of all student course experiences for students who were enrolled in and completed courses taught in both an online and traditional lecture format by the same professor during the same semester and year ($n = 5,477$). The total number of distinct students enrolled in the courses from the sample was 4,120.

For objective two, a purposive sample was selected that consisted of all student course experiences for students enrolled in courses taught in both an online and traditional lecture format by the same professor during the same semester and year ($n = 5,778$). The total number of distinct students enrolled in the courses from the sample was 4,307.

For objective three, the sample included all student course experiences for students enrolled in online courses taught consistently during each of the 16-week semesters between fall 2004 and spring 2009 ($n = 8,445$). Of the 41 subject areas with courses delivered between fall 2004 and spring 2009, only 14 subject areas were delivered during each of the semesters between fall 2004 and spring 2009. The total number of distinct students enrolled in courses from the sample was 3,932.

Data for the research objectives were extracted from the student records system using the Oracle Structured Query Language (SQL). For objectives one and two, all courses taught during full 16-week semesters were identified and extracted into a temporary table. Using the temporary table as the research sample, a SQL statement was written to find all courses with both online and traditional sections taught by the same professor during the same semester and year. With the sample courses identified, course delivery mode, registration status, and final grade were extracted for all students enrolled in the sample courses. No student identifying information was included in the data extraction.

For objective one, a comparison of student academic performance, all students with a registration status code other than dropped or withdrawn were included in the sample. This objective was intended to measure academic performance, only students who completed the course were included. Student academic performance was measured by the final course grade.

For objective two, a comparison of course completion, all students enrolled in the sample courses were used. Students with a grade code of A, B, C, D, or F and registration status other than dropped or withdrawn were flagged as retained and all others were flagged as not retained.

For objective three, a comparison of online course completion by course discipline, data extracted included registration status, final grade, and course subject for all students enrolled in all online courses identified in the initial base course table. Course discipline was defined as the subject area a course was associated with for a particular college and department. Subject areas were designated by a four character abbreviation and assigned to all courses listed in the host institution's course catalog.

Pearson's chi-square test was used to determine if statistically significant differences existed in retention or performance by mode of instruction. "Chi-square is the inferential technique used to determine statistical significance of a relationship" (Wallen & Fraenkel, 2001, p. 530). An alpha level of .05 was set a priori to determine if an association existed between the independent variable – delivery mode – and the dependent variables retention and performance. For objective three, a chi-square test was calculated on all students enrolled in online courses to determine if there was a statistically significant difference in the expected and observed retention by course discipline.

Results

Objective one was to determine if a statistically significant difference existed in academic performance of students enrolled in online courses compared to students enrolled in traditional courses. A chi-square analysis was performed in SPSS to determine if there was a statistically significant difference in student performance between students enrolled in online courses and students enrolled in traditional courses. Students enrolled in online courses had the highest percentage of As at 34.6% compared to students enrolled in traditional courses at 31.3%. Table 1 displays the grade distribution by course delivery modality. The difference in performance was statistically significant, $\chi^2(4, N = 5,477) = 27.383$, $p < .05$ (see Table 1).

Table 1

Contingency Table for Students' Academic Performance (N = 5,744)

Modality	A (%)	B (%)	C (%)	D (%)	F (%)	Total
Online	631 34.6%	562 30.8%	296 16.2%	141 7.7%	195 10.7%	1,825
Traditional	1,142 31.3%	1,180 32.3%	762 20.9%	270 7.4%	298 8.2%	3,652
Total	1,773 32.4%	1,742 31.8%	1,058 19.3%	411 7.5%	493 9.0%	5,477

Note. $\chi^2 = 27.383$, critical value = 9.49, d.f. = 4

Objective two was to determine if there was a statistically significant difference in the retention of students enrolled in online courses compared to students enrolled in traditional courses. A chi-square analysis was performed in SPSS to determine if there

was a statistically significant difference in course completion between students enrolled in online courses and students enrolled in traditional courses. Students enrolled in online courses had the lowest course completion rates at 93.3% compared to students enrolled in traditional courses at 95.6%. Table 2 displays the course completion distribution by course delivery modality. The difference in retention was statistically significant, $\chi^2(1, N = 5,778) = 14.132$, $p < .05$ (see Table 2).

Table 2

Contingency Table for Course Completion Rates (N = 5,778)

Modality	Retained (%)	Not retained (%)	Total
Online	1,825 93.3%	132 6.7%	1,957
Traditional	3,652 95.6%	169 4.4%	3,821
Totals	5,477 94.8%	301 5.2%	5,778

Note. $\chi^2 = 14.132$, critical value = 5.99, d.f. = 2

Objective three was to determine if there was a statistically significant difference in the retention of students enrolled in online courses by course discipline. A chi-square analysis was performed in SPSS to determine if there was a statistically significant difference in students' course completion by course discipline. The 14 different disciplines included in the chi-square analysis were accounting, agricultural education, computer information systems, English, finance, general business, health, human resource management, management, marketing, physical education, psychology, reading, and special education. Finance had the lowest course completion rate at 82.2% compared to reading with the highest retention rate at 98.2%. The difference in retention by course discipline was statistically significant, $\chi^2 (13, N = 8,445) = 96.974$, $p < .05$ (see Table 3).

Table 3

Contingency Table for Course Completion by Course Discipline (N = 8,445)

Modality	Retained	Not retained	% Retained	Total
Computer information systems	1,311	118	91.7	1,429
General business	1,187	88	93.1	1,275
Management	1,000	81	92.5	1,081
Psychology	924	93	90.9	1,017
English	654	63	91.2	717
Physical education	450	23	95.1	473
Marketing	417	33	92.7	450
Special education	386	16	96.0	402
Health	339	11	96.9	350
Human resource management	278	40	87.4	318
Finance	245	53	82.2	298
Agricultural education	271	22	92.5	293
Accounting	151	24	86.3	175
Reading	164	3	98.2	167
Totals	7,777	668	92.1	8,445

Note. χ^2 = 96.974, critical value = 22.36, d.f. = 13

Conclusions and Recommendations

The growth rate of student enrollments in online courses is outpacing the growth rate of the total higher education student population (Allen & Seaman, 2008). Research on the course completion rates in online education is mixed. Some research has found course completion in online courses was as good as or better than in traditional courses (Roach, 2002). Other researchers have found that traditional courses have higher course completion rates when compared to online equivalents (Brady, 2001; Carr, 2000; Simpson, 2003).

Course completion and student performance has financial impacts on students as well as the university. The THECB (2008) proposed a shift in formula funding from attempted to completed semester credit hours. If retention and completion in online courses is lower than the traditional classroom setting, the host university could potentially lose a portion of state funding. Understanding where retention in online courses is a problem will allow the host university to take corrective action in order to increase retention and student success in online courses. Additionally, the Texas Administrative Code dictates that a university "shall not submit for formula funding any

hours for a course that is the same or substantially similar to a course that the student previously attempted for two or more times at the same institution" ([TAC], Title 19, Part 1, Rule 13.105, 2005). To compensate for the loss of state funding, the university could charge tuition up to the out-of-state tuition rates for the course.

Objective one sought to determine if statistically significant differences existed in student performance between online and traditional courses. A chi-square analysis on the dataset indicated that a statistically significant difference did exist in the student performance between online and traditional courses. This finding supports previous research on student performance in online courses (Faux & Black-Hughes, 2000; Paden, 2006; Shoenfeld-Tacher, McConnel, & Graham, 2001). Additional observation of the grade frequencies found a higher percentage of As, Ds, and Fs in online courses, while traditional courses had a higher percentage of Bs and Cs. Shoenfeld-Tacher et al. found student academic performance as measured by a post-test in an online science course was significantly different and superior to student performance in the traditional course section. Paden found that student academic performance in an introductory math course was significantly different between online and traditional delivery. Contrary to what Shoenfeld-Tacher et al. found, Paden noted academic performance of students enrolled in the traditional section of the introductory math course was superior to students enrolled in the online section.

With regard to objective two, statistically significant differences did exist in course completion rates between online and traditional course delivery. This finding supports research conducted by McLaren (2004), Paden (2006), and Roach (2002) who found differences in course completion rates between online and traditional courses. Additional analysis indicated that students enrolled in online courses had a lower course completion rate (93.3%) than students enrolled in traditional courses (95.6%). This supports research by Paden who found that traditional course delivery had a higher retention rate compared to online delivery for students enrolled in an introductory math course. Nelson (2006) found statistically significant differences in student retention rates between online and traditional course delivery.

With regard to objective three, statistically significant differences existed in course completion rates by course discipline. Additional observations supported previous research that suggested some disciplines may not be well-suited to online delivery (Carnevale, 2003; Nelson, 2006; Noble, 2004; Paden, 2006; Smith, Heindel, & Torres-Ayala, 2008). Course completion varied by discipline with reading having the highest rate at 98.2% and finance with the lowest at 82.2%. Nelson examined course completion rates for nine disciplines and found that no statistically significant differences existed for seven of the disciplines. However, statistically significant differences did exist in criminal justice and psychology and Nelson suggested that these course disciplines might not be conducive to online delivery. Smith et al. (2008) compared online and traditional course completion rates in mathematics courses and found lower retention rates in online mathematics courses. The researchers suggested that mathematics might not be appropriate for online delivery.

The research was conducted using archival data from the host institution's student record system. No data was available on student perceptions of the courses or student aptitude with the technology used for course delivery. Additional student characteristics such as age, gender, ethnicity, classification, major, and experience with online course delivery were not evaluated as part of this research. What type of student is likely to succeed in online courses? Does experience with the technology lead to greater course completion and improved student performance in online courses? More research into student characteristics could help identify possible variables to predict student success in online courses.

References

Allen, I. E., & Seaman, J. (2008). *Staying the course: Online education in the United States, 2008.* Needham, MA: The Sloan Consortium.

Berger, J. B., & Lyon, S. C. (2005). Past to present a historical look at retention. In A. Seidman (Ed.), *College student retention formula for student success* (pp.1-29). Westport, CT: Prager.

Brady, L. (2001). Fault lines in the terrain of distance education. *Computers and Composition, 18*(4), 347-358.

Carnevale, D. (2003). The virtual lab experiment: Some colleges use computer simulations to expand science offerings online. *The Chronicle of Higher Education, 49*(21), A30.

Carr, S. (2000). As distance education comes of age, the challenge is keeping the students. *Chronicle of Higher Education, 46*(23), A39-A41.

Clark, R. (1994). Media will never influence learning. *Educational Technology Research and Development, 42*(2), 21-29.

Faux, T. L., & Black-Hughes, C. (2000, July). A comparison of using the internet versus lectures to teach social work history. *Research on Social Work, 10*(4), 454-466.

Fraenkel, J. R, & Wallen, N. E. (2006). *How to design and evaluate research in education* (6th ed.). New York, NY: McGraw-Hill.

Gagne, M., & Shepherd, M. (2001, April). A comparison between a distance and a traditional graduate accounting class. *T.H.E. Journal.* Retrieved from http://thejournal.com/Articles/2001/04/01/A-Comparison-Between-a-Distance-and-a-Traditional-Graduate-Accounting-Class.aspx

Harasim, L. (2000). Shift happens: Online education as a new paradigm in learning. *Internet and Higher Education, 3,* 41-61.

McLaren, C. H. (2004, Spring). A comparison of student persistence and performance in online and classroom business statistics experiences. *Decision Sciences Journal of Innovative Education, 2*(1), 1-10.

Nelson, P. F. (2006). Student retention in online education at the community college. Retrieved from ProQuest. (UMI 3222374)

Noble, J. V. (2004). For science and math, skip the online course. *Communications of the Association for Computing Machinery, 47*(10), 12-13.

Paden, R. R. (2006). A comparison of student achievement and retention in an introductory math courses delivered in online, face-to-face, and blended modalities. Retrieved from ProQuest. (UMI 3237076)

Palloff, R., & Pratt, K. (2003). *The virtual student.* San Francisco, CA: Jossey-Bass.

Roach, R. (2002). Staying connected: Getting retention right is high priority for online degree programs. *Black Issues in Higher Education, 19*(18), 22-25.

Russell, T. L. (2001). *The no significant difference phenomenon: A comparative research annotated bibliography on technology for distance education.* Raleigh, NC: IDECC.

Shoenfeld-Tacher, R., McConnel, S., & Graham, M. (2001). Do no harm-A comparison of the effects of on-line vs. traditional delivery media on a science course. *Journal of Science Education and Technology, 10*(3), 257-265.

Simpson, O. (2003). *Student retention in online, open, and distance learning.* London, UK: Kogan Page.

Smith, G. G., Heindel, A. J., & Torres-Ayala, A. T. (2008). E-learning commodity or community: Disciplinary differences between online courses. *Internet and Higher Education, 11*, 152-159.

Terry, N. (2001). Assessing enrollment and attrition rates for the online MBA. *T.H.E. Journal, 28*(7), 64-68.

Texas Higher Education Coordinating Board. (2008). *Formula funding recommendations for the 2010-2011 biennium.* Austin, TX: Office of External Relations.

Texas Secretary of State. (2005). Texas administrative code. Retrieved from http://info.sos.state.tx.us/pls/pub/tacctx$.startup

Waschull, S. B. (2001). The online delivery of psychology courses: Attrition, performance, and evaluation. *Teaching of Psychology, 28*(2), 143-147.

Athabasca University

Mobile App Design for Teaching and Learning: Educators' Experiences in an Online Graduate Course

Yu-Chang Hsu and **Yu-Hui Ching**
Boise State University, USA

Abstract

This research explored how educators with limited programming experiences learned to design mobile apps through peer support and instructor guidance. Educators were positive about the sense of community in this online course. They also considered App Inventor a great web-based visual programming tool for developing useful and fully functioning mobile apps. They had great sense of empowerment through developing unique apps by using App Inventor. They felt their own design work and creative problem solving were inspired by the customized mobile apps shared by peers. The learning activities, including sharing customized apps, providing peer feedback, composing design proposals, and keeping design journals (blogging), complemented each other to support a positive sense of community and form a strong virtual community of learning mobile app design. This study helped reveal the educational value of mobile app design activities and the web-based visual programming tool, and the possibility of teaching/learning mobile app design online. The findings can also encourage educators to explore and experiment on the potential of incorporating these design learning activities in their respective settings, and to develop mobile apps for their diverse needs in teaching and learning.

Keywords: Online learning; mobile app design; programming; App Inventor (AI); virtual learning community (VLC)

Introduction

The rapidly advancing mobile computing technologies along with abundant mobile software applications ("mobile apps" hereafter) make ubiquitous mobile learning possible (Johnson, Adams, & Cummins, 2012). The major affordances of mobile computing technologies for learning include user mobility resulting from device portability, relatively strong computing power in small devices, and always-on connectivity (Hsu & Ching, 2012). These affordances lead to tremendous potential for innovative uses of mobile technologies in education. In addition, mobile devices such as smartphones or iPod touches are vastly gaining popularity (Johnson, Levine, Smith, & Stone, 2010) due to the availability of various easy-to-use mobile software applications. There were more than 800,000 mobile apps for iOS devices in Apple's AppStore and Android OS devices on Google Play (formerly Android Market) respectively across over 20 categories (Wikipedia, 2013a; Wikipedia, 2013b).

The innovation in mobile apps has raised interests among educators because it facilitates teaching and learning (Johnson et al., 2012). However, relevant and appropriate apps are not always available; teachers can only judge apps by reviews or anecdotes instead of testing them. These reasons lead to the needs and benefits for creating one's own mobile apps for teaching and learning. In addition, empowering educators to create their own mobile apps for teaching and learning is likely to lead to advantageous use of mobile technology that benefits student learning. For example, pre-service science teachers engaged in the development and customization of a smartphone application that supported student scientific inquiry (Price et al., 2012). However, designing educational mobile applications remains a challenge for educators without previous programming experiences. In particular, the effort and time required to learn to code in textual programming languages make it unrealistic for educators to develop their own apps. Fortunately, some visual programming languages have been developed to address these challenges. App Inventor (AI), a web-based GUI (graphical user interface) builder (Wolber, 2010) by Google Inc. and Massachusetts Institute of Technology, allows anyone with a Google account to prototype and develop Android mobile apps through its visual block-based programming language by drag-and-drop actions (Hsu, Rice, & Dawley, 2012).

Currently, most examples using AI for education focus on teaching programming to K-16 students with various levels of prior programming knowledge (e.g., Margulieux, Guzdial, & Catrambone, 2012; Morelli, Lake, Limardo, & Tamotsu, 2011; Wolber, 2010; Wolber, 2011) (see http://appinventor.mit.edu/explore/stories.html). In addition, most of these current practices and studies were conducted in face-to-face settings. While these research findings and stories revealed success in using AI for teaching and motivating students to program, there is little practice or research on examining non-programmer adults' online learning experiences of creating their own mobile apps for education. This paper aims to help fill the void of research on online learning of mobile app programming of educators who are neither programmers nor computer science majors. By examining the experiences of non-programmer educators in mobile

programming in online environments, we hope the findings of this research help elucidate the potential and value of promoting mobile app programming for authentic educational uses.

Literature Review

Teaching and Learning Programming Online

Among the scarce studies on teaching programming online, Wang (2011) reported her experiences teaching object-oriented programming online to students majoring in computer science. She argued that it is difficult for students to get instant instructor feedback in online environments, while this type of feedback is especially important for programming learners. Also, she indicated it is critical for students to see how others approach the same programming problem with their solutions and collaborate with other students. Both aforementioned aspects can be challenging for instructors and students. Based on her research, she suggested three strategies to improve students' online learning experiences of programming: 1) creating a virtual computer lab to allow students to engage in programming activities immediately without the frustration and constraints of installing programming environment software at home or in the workplace; 2) adding more multimedia materials into the course such as videos that make the instruction engaging and easy to follow; 3) creating a sense of community among students to help them support each other. In a course on Java programming, McKelvey and Curran (2012) incorporated discussion forums in a course management system to facilitate discussions on assigned programming topics, team interaction, and communication. Considering the suggestions from Wang (2011) and McKelvey and Curran (2012), we determined that it is important to build an online community to support online programming activities.

Online Learning Community to Support Learning of Programming

Learning mobile programming can be challenging for educators who are not programmers, especially in an online learning environment. As such, an effective learning environment should build in rich support for these educators. In the course of mobile app design examined in this current study, an online learning community was formed to support learners. A learning community refers to a social community of learners who share knowledge, values, and goals while learning (Rovai, 2002b). There are four critical social components in an online learning community: communication, collaboration, interaction, and participation (Lock, 2002). Through active participation, learners collectively inquire into specific topics, share and exchange thoughts and experiences, and make improvements to ideas to develop deeper understanding (Lave &

Wenger, 1991). Support from peers in the community can greatly enhance learning in an online environment. In addition, members in a well-functioning community should develop a strong "sense of community" as demonstrated by the mutual interdependence among members, connectedness, trust, interactivity, and shared values and goals (Rovai, 2002b, 2002a). Various instructional strategies were adopted in the current study to help build a strong online learning community and to strengthen the "sense of community" among learners.

The Benefits of Visual Programming Tools for Non-Programmers and Using Mobile Apps as End Products

Visual programming can be a good solution to help non-programmers learn programming more easily. Visual programming tools enable people to see and test what they build immediately after putting together the pieces of different components. These tools also create a more enjoyable programming experience by reducing the frustration of getting lost in textual codes and debugging. Since Glinert's (1986) pioneering work on BLOX (a visual programming language consisting of puzzle-like pieces), there have been a few successful visual programming tools available. For example, Scratch is a free tool that makes it easy to create one's own interactive stories, animations, games, music, and art in two-dimension format (Lifelong Kindergarten Group, 2006). Another tool, Alice, is a three-dimensional (3D) programming environment for creating story-telling animations, playing interactive games, or sharing videos on the Web (Carnegie Mellon University, 2008). One great advantage of introducing programming to novices with visual programming languages is that it can help them avoid syntax errors commonly seen in working with textual programming languages. In addition, the drawer analogy used for arranging the puzzle pieces (called "blocks" in App Inventor) with similar function can reduce the need for novices to remember exact textual codes (Turbak et al., 2012), which can greatly reduce the potential cognitive load caused by programming with textual codes (Margulieux, Guzdial, & Catrambone, 2012).

App Inventor (AI) also features drag-and-drop visual programming, which lets designers see how different pieces come together, and how their programming relates to the behaviors of their artifacts/products—the mobile apps (Hsu, Rice, & Dawley, 2012). AI is a free web-based tool that consists of two major elements: Component Designer (see Figure 1) and Block Editor (see Figure 2) which together allow users to develop mobile apps running on Android devices. Component Designer lets one design the app's interface and integrate non-visible components (i.e., feature/function not visible to users on the mobile device interface) such as GPS (global positioning system) or sound. Block Editor allows one to program mobile apps' behaviors and to control how apps react under certain circumstances. This tool has great potential for enabling educators with limited programming knowledge and experiences to experiment and design mobile apps that suit their professional needs.
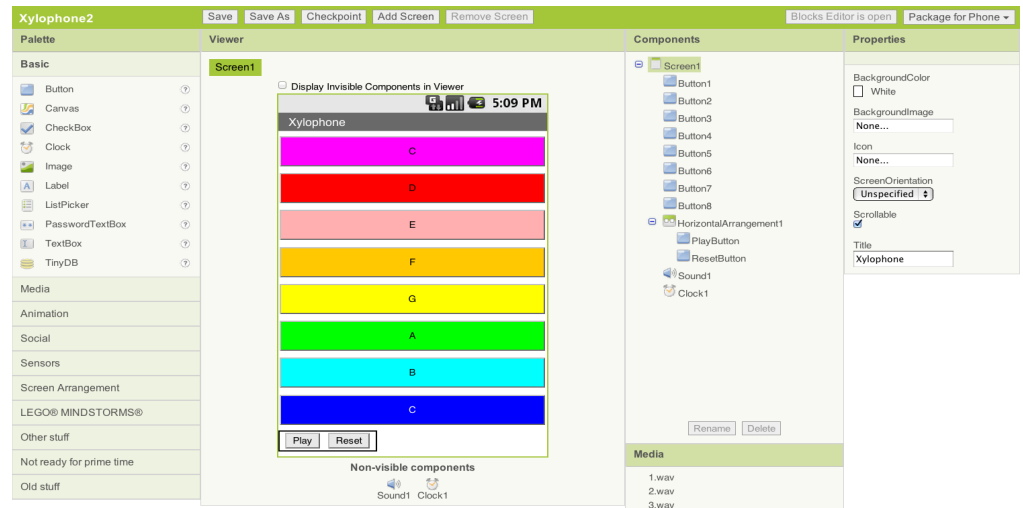
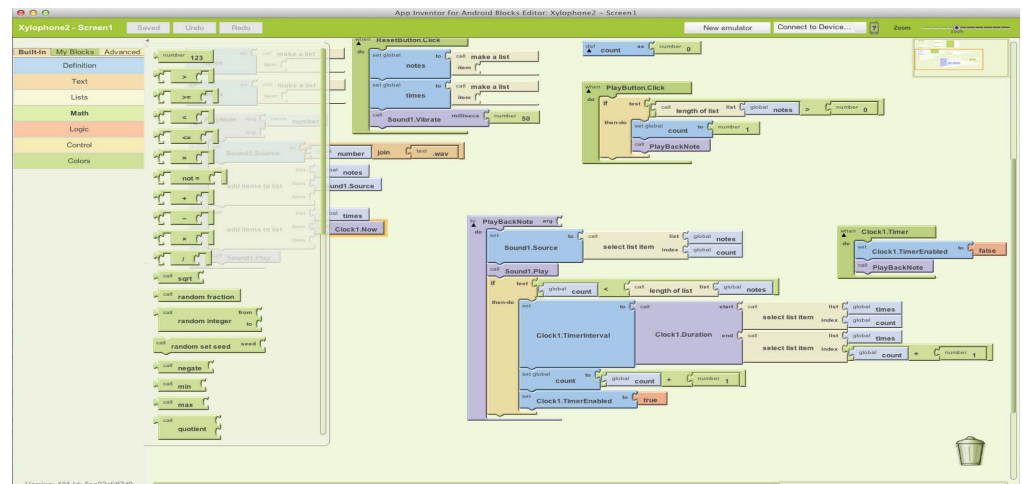*Figure 1.* Component Designer.

Figure 2. Block editor.

Another strength of AI lies in the design products themselves—the mobile apps can be tested, used, or played immediately on one's mobile device. This gives a sense of practicality and reality in achievement, which can be very satisfying experiences in one's learning. Like Scratch and Alice, the process of creation with AI can stimulate fun, creativity, and learning about programming. AI also takes it further—the products created through AI can go anywhere with the users and afford practical use in real-life.

Research Purpose and Questions

The purpose of this research is to explore how non-programmer adults who are educators learned to design mobile apps for teaching and learning through peer support and instructor guidance in an online graduate course. The research questions are as follows:

- What is students' sense of community in this online course?

- What are students' overall experiences of learning mobile programming in an online course?

- How does students' sharing of mobile app ideas, app customizations, and peer feedback influence their learning of mobile app design?

- What are students' perceptions of major assignments to support their app design experiences in this course?

- What are students' perceptions of App Inventor as a tool for learning mobile app design and for developing mobile apps?

Through this study, the authors aim to 1) depict non-programmers' experiences of learning mobile app design in an online course; 2) explore the practices and challenges in teaching mobile app programming online; 3) examine the strengths and constraints of App Inventor as a web-based tool for learning and teaching mobile app programming; 4) provide useful design suggestions for educators interested in incorporating mobile app design in developing students' creative problem-solving through programming.

Methods

Context and Learning Environments

This study was implemented in a fully online graduate course on mobile app design in a mid-size state university in the northwestern United States. The goal of this course was for students to learn to design engaging and practical Android mobile apps for teaching and learning by using App Inventor. This course consisted of the following components:

1) Moodle learning management system, where course instruction was posted, and students shared their app design and provided each other constructive feedback on weekly discussion forums;

2) individual app design journal, where on their blogs students reflected upon their design experiences using AI, exploring learning resources, and their inspiration from peer ideas and projects;

3) a Google site where students posted their app files and created QR (quick response) codes of their apps for review and testing.

Through the various components, this course intended to help sustain a virtual learning community (VLC) for non-programmer adults to support and inspire each other's learning and design work, and cultivate a sense of community, including the feelings of connectedness among community members and commonality of learning expectations and goals, which is critical to successful learning in a VLC (Hsu & Ching, 2011). On weekly forums, the sharing of mobile app design and providing peer feedback helped students engage in communication, interaction, and participation for collaborative knowledge construction in a VLC (Lock, 2002). Through keeping a design journal, the students engaged in reflective practice and internal conversation for individual knowledge creation that enhanced their learning (Baker, Kolb, & Jensen, 2002; Shumack, 2010). Journaling in the form of blogging has been commonly used for reflective practices in learning (e.g., Ferdig & Trammel, 2004; Ladyshewsky & Gardner, 2008; Shoffner, 2009). The thirteen students enrolled in this course included K-12 teachers, school technology specialists, and corporate personnel from education industries. Although AI provided an emulator that allowed testing an app virtually, students were required to own or at least have access to smartphones or tablets running Android OS version 1.6 or higher so that they could be engaged in the full experience of app design and testing, because some functions (e.g., shaking the device to activate an action) were only available on physical mobile devices. The learning environments and components, including AI, complemented each other to help form a VLC of mobile app design (see Figure 3).
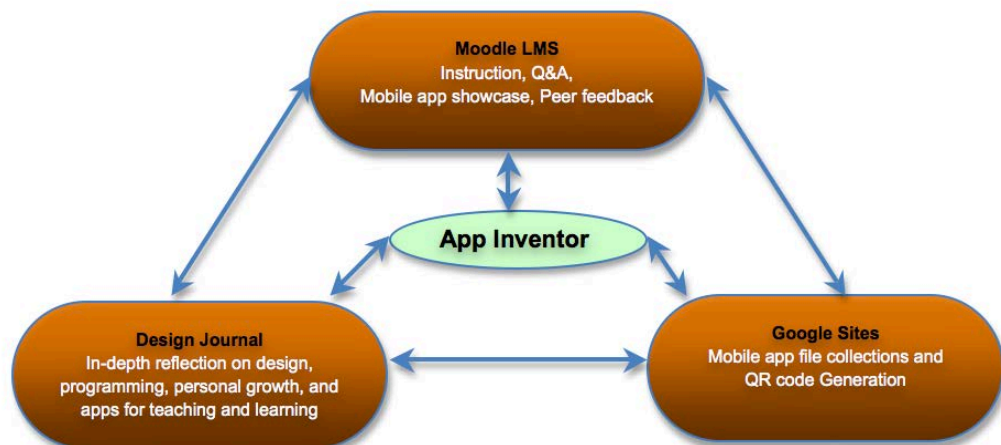

Figure 3. The integration of learning environments in the online course in mobile app design.

Mobile App Design Activities and Reflective Practice

Each student learned by doing (designing)—they developed eight practice apps by following the tutorials in the textbook authored by Wober, Abelson, Spertus, and Looney (2011), and incorporated customizations on interface, theme, and function into their apps from Week 3 to Week 10. The students then developed their own app design proposals individually using the templates provided by the instructor. The proposal included three major sections:

1) a planning table that involved user analysis, context analysis, rationale for the app, and future plan with this app;

2) app component map, where the students described and depicted the interface components and how users would interact with their apps;

3) app behavior flowchart, where the students presented the logic of app behaviors in detail and the thought in terms of blocks programming and how the app worked behind the scenes.

At the end of the semester, each student completed his/her final project by submitting one final original app (see Figure 4) based on the ideas delineated in their app design proposal. Throughout the semesters, students provided each other feedback regarding the customized apps, ideas for further customizations, design proposals, and final project apps. Students also shared resources such as web tutorials, and helped answer questions on app programming and debugging. In addition to the actual design (learning by doing) and peer review (social learning) activities, students also engaged in reflective practice by keeping app design journals on their blogs dedicated to this mobile app design course. Journal writing has been established as an experiential approach consisting of internal conversation for knowledge creation and facilitating one's learning (Baker, Kolb, & Jensen, 2002; Shumack, 2010). Through design journals, students in this course documented and reflected on their growth as app designers. They reflected upon the joys and struggles encountered during the design process, the inspiration from their peers' work, ideas for future apps and customizations, and what the learning experiences meant to them in their professional contexts. In sum, the learning environments, hands-on app programming activities, app design proposals, peer review of the apps, and reflective practice complemented each other to enrich and support students' learning of mobile app design in an online setting. Figure 4 shows a variety of student final project apps that include app genres such as utility, learning, and game.

Figure 4. Various types of students' project apps.

Research Design and Data Sources

This study applied a mixed-method design. The researchers collected both quantitative and qualitative data to depict students' mobile app design activities in this online course. A web-based survey was implemented at the end of this course (Week 16), which collected students' demographic information, perceptions of sense of community, reporting of time on participation in class activities, perceptions of learning activities, and perceptions of App Inventor as a tool to create mobile apps. The survey was conducted by the second author and the participants' identification information was removed by the second author before data analysis, so the first author (also the course instructor) could not link participants' responses with their names. This procedure was in place to help avoid potential issues of research participation coercion and response bias. Also, students' artifacts, which included customized practice apps and final project apps, were examined to reveal their learning growth. In addition, students' 10 weeks of design journal entries were analyzed to help triangulate and interpret students' responses in the survey. The rich data and analysis helped us answer the research questions mentioned above, including perceptions of learning supported by a virtual

community, experiences in the various learning activities designed to help learning app design, and influence of peer feedback and app ideas on students' final projects.

Results and Discussion

Participants, Mobile Devices, and Android Emulator

Ten of the thirteen students enrolled in this course participated in this study. All of the 10 participants own the Android phones they used to develop mobile apps. The lead brands owned by participants were HTC (5 students), followed by Motorola (2 students), LG (2 students), and Samsung (1 student). In terms of Android OS version, six used Android 2.3 and its variations, two used Android 2.2 and its variations, and one used Android 2.1. One participant did not specify the Android OS on his/her phone. Two of the participants also indicated they owned tablets during the class, and one of them also tested his apps on tablets in addition to testing on his smartphone, before sharing with peers. In addition to testing apps on mobile devices, four of the ten participants indicated they tested apps using the Android Emulator (a virtual mobile device) that came with Android SDK (software development kit), while five of the ten participants rarely used it and one never used it.

Time on Task

The majority of students (7 of 10) spent between 2 to 4 hours each week creating original practice apps by following the tutorials in the textbook. For customization of the practice apps, six students spent about 4 hours each week. Eight of ten students spent 1 to 2 hours searching for or studying tutorials online to help their app customizations. Most students (8 of 10) spent one hour reviewing peers' apps each week. While 6 of 10 students spent 4 to 5 hours developing their app design proposals, one student spent as little as 2 hours on the proposal and another spent as many as 25 hours on this task. Time spent on the final project app varied to a great extent, from 10 hours to more than 80 hours.

Sense of Community

For each item on the Sense of Community scale (see Rovai, 2002a, 2002b), the possible score ranged from 1 to 4 points (1 = *strongly disagree*; 2 = *disagree*; 3 = *agree*; 4 = *strongly agree*). An examination of the item means showed that the participants' responses mostly fell into the "agree" category (near or above 3) (see Table 1). The mean score across the 20 items of the SoC scale is 3.13, which indicates students had an overall positive sense of community in this app-design course. When further breaking down the SoC scale into the subscales, the mean score across the 10 items of the Connectedness subscale was 2.99, which indicated students felt connected to class

members. In addition, the mean score across 10 items of the Learning subscale was 3.26, which showed students felt positive about their learning experiences in this course.

Table 1

Survey Item Response Mean Scores

Item no.	Items	Response mean score
1	**Classmates care about each other**	3.10
2	I am encouraged to ask questions	3.30
3	**Feel connected to others**	3.10
4	Feel easy to get help	2.90
5	**Feel a spirit of community**	3.20
6	Feel receiving timely feedback	3.30
7	**Feel the course being like a family**	2.50
8	Feel easy exposing gap in my own understanding	3.10
9	**Feel not isolated in this course**	3.20
10	Feel willing to speak/communicate openly	3.20
11	**Trust others in this course**	3.20
12	Feel this course resulting in more than modest learning	3.30
13	**Feel able to rely on others in this course.**	3.10
14	Feel other students helping me learn	3.30
15	**Feel members of this course depending on me**	2.30
16	Feel being given ample opportunities to learn	3.20
17	**Feel certain about others in this course**	3.10
18	Feel my educational needs being met	3.40
19	**Feel confident that others will support me**	3.10
20	Feel this course promoting a desire to learn	3.60

Note. Boldface: "Connectedness" subscale; non-boldface: "Learning" subscale.

Students' Perceptions of Overall Experiences of Learning Mobile Programming in an Online Course

In the following subsections, we present the themes that reflect different aspects of students' mobile app design experiences emerging from participants' open-ended responses and their blog entries.

Overall app design experience in this course.

Students spoke highly about their overall experiences in this class on several aspects. One student indicated:

> It was so much fun to be creative and imagine the possibilities of using a program like this with students, and to develop apps for the classroom. Although the class was challenging, I felt like I could manage the work with the support from both my peers in the class and

[the instructor]. What a great feeling to have a completed, original app developed.

Another student commented how immersed and engaged he/she was when designing apps:

> I really enjoyed the time that I had to create the app and wish that I had all the time in the world to develop more. ...I have so much fun doing it that about 9 hours went by before I completed the app, and all weekend I have thought about 10 more things that I would like to change to make it better.

Learning transfer and beyond.

One student with other experiences involving computational thinking and logic revealed how he/she benefited from this course: «[it] influenced my understanding of logic and programming in other areas, especially in Excel and MySQL statements and formulas.»

Yet another student took the learning experiences beyond this course and created wonderful teaching moments for his/her students:

> I have taken the apps I have created so far and let some of my students try them out. This past week, after trying the PaintPot app, one of my students asked, "Are we going to get to use these in class?" The level of excitement on her face was priceless. So, I opened a dialogue, asking how she thought we might be able to use apps in class. We shared an open dialogue that included many great ideas and platforms from which I can begin to shape apps in the future.

Growth as an app designer.

Some students found it fun and fulfilling and talked about their growth as app designers:

> I'm finding it fun to begin to see the secret door behind app developing. I'd only been a previous user of apps before this class, and had never thought about the complexities that go into the design and programming of their functions.

Around the time when students were building the last three of their eight practice apps, most students became fluent with the block-based programming language: « I'm beginning to understand some of the logic behind the different options and blocks, something I never have before in previous programming exposure. »

Empowerment.

Many students felt a sense of empowerment and achievement because they could handle a tool that allowed them to use their creativity and develop something that might not have existed before. For example,

> I feel more empowered by being able to develop an idea and actually make it real, and have others run my app. There is a strong feeling of success. Also, knowing I now have the ability to make something that may not exist yet is a great feeling.

> I do feel empowered by learning to use the blocks to program behavior, creating a working original app, and sharing my work with my peers and also with my colleagues at work.

> I definitely feel empowered and have actually started to incorporate App Inventor into my Introduction to Java Programming course at my high school. All the knowledge of this course is completely new to me and very useful.

Perceptions of Class Activities

Learning by doing: App design and customization.

Students were very positive about the learning-by-doing experiences provided by the actual mobile app design and required customizations. They also appreciated the opportunities of making mistakes and resolving the problems during the processes.

> This is a great way to use authentic learning for the learners- give them a real practical and useful goal, then allow them the chance to make mistakes and search out the answers for themselves. Very cool.

App design proposal.

Some students recognized the benefits of designing their apps by starting with a proposal with appropriate prompts:

> This is pretty much the perfect way to begin designing an app. The Template caused me to really think about how and why a user would want to use the app. It also forced me to think ahead a few steps and consider future modifications.

> I think this is an absolutely necessary step. By the time I started my actual design I already had most of my graphics done due to the design proposal stage.

Others found it authentic to build an app by figuring out the blueprint first, but hoped for more time on this stage:

> I think there are many benefits to creating the proposal, it adds a layer of realness to the process. All programs start on paper, and build up from there. The challenges in the process were due to time. I think there should have been more time to create the design. Just felt rushed through the process.

App design journal (blogging).

The app design journal (see Figure 5 for an example) helped students document their work, and reflect on their growth as well as the inspiration obtained from peers' work. Students also appreciated that the journal can be incorporated into their degree program portfolios.

> Keeping a journal allows me to express my thoughts and opinions about the weekly process more than just the design, which is beneficial for me as a professional.

> This is a great journal to refer back to and having this already in place gives me a leg up on preparing my portfolio. I wish all courses made this a requirement.

Keeping the journal is also beneficial for developing students' own apps: « This week, we began design of our final app for the course. I looked back upon my previous blog reflections to help generate some ideas. »
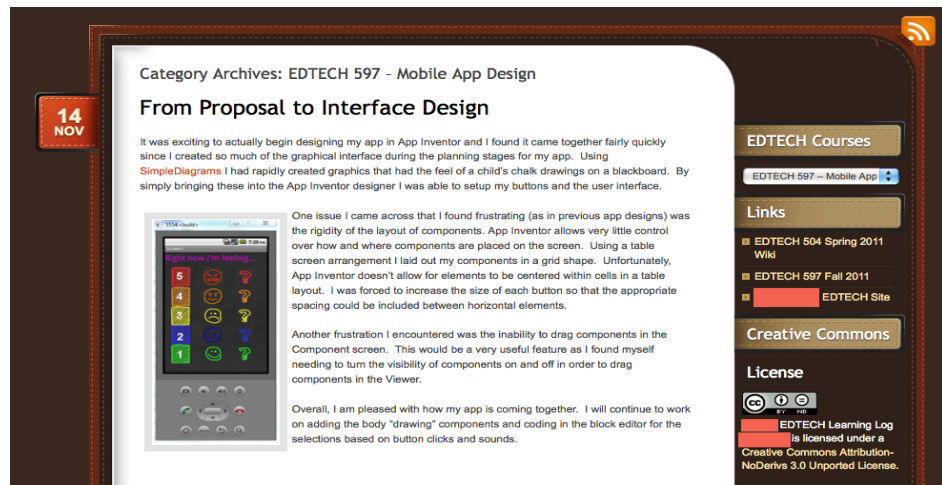
Figure 5. An example of app design journal.

Sharing Is Good: Mobile App Ideas, Customizations, and Peer Feedback in the Virtual Community

Some students were not quite sure about openly sharing their ideas and design initially as that might expose the gap in their knowledge and skills. However, the concern and uneasiness was relieved after realizing the benefits of openly sharing in an environment where they felt safe and comfortable.

> I was initially nervous about sharing everything but then I realized we are all in the same boat. Everyone was so willing to help one another. There was a great sense of community and I learned a huge amount by looking at my peers' ideas and blocks.

Students found it useful to review others' work for inspiration and to get feedback:

> I like reviewing the designs of others to get ideas and help troubleshoot. I like receiving honest feedback about my own apps, often to catch things I may miss.

> I like it a lot, the feedback is great and it has been tremendously inspirational to see the innovation and talent that exists among my peers.

The sharing activity also provided examples and modeling of creative design problem-solving:

> Without seeing the work of my peers I wouldn't have been exposed to the numerous approaches to customization of these projects.

> Benefit was huge—learn about different possible ways to achieve the same programming outcomes

Experiences of Designing Mobile Apps with App Inventor

Strengths.

Students appreciated the accessibility of AI as an app design tool: « It's a great, no-fear approach to programming – people are normally turned off by foreign programming language. »

In addition, students considered this course led to fun learning experiences that they enjoyed sharing with others: « It was a lot of fun and sparked quite a bit of interest with people when I talked about the course. »

One student specifically commented on the educational value of app design with AI:

> I would introduce this class to a computer class or a class with my students. I think that this type of activity is very important for students to learn. Building these apps and customizing them forced us to use creative thinking to solve design problems. This is where we want our students to go.

AI as a tool for learning app design and programming apps.

Overall, students are very positive about AI as a learning tool and design tool. The students like how quick and easy AI allows for putting together a working app:

> App Inventor's power is in how quickly a functional app can be developed. I can see myself using it as a prototyping application to see quickly how an app would look and function, then use a more advanced development environment to build the app with more functionality.

Considering the convenience of AI for programming app behaviors, testing apps, and documenting design thinking, one student commented: « ...you could activate or deactivate blocks. I also liked that I could add comments to my blocks. »

On a broader scope, one student commented on the available mature community external to this course for developing mobile apps with AI. This kind of support can help sustain interests in developing apps with AI:

> I like ... there is an informed and supportive community of users on the Internet. I was able to solve a lot of problems by browsing through message boards.

Room for improvement.

While students are excited and passionate about developing mobile apps with AI, it can be challenging at times. For example, in terms of the block-based interface, one student indicated that « The brick [block] designer is annoying once your app begins to grow larger. »

This is a fair observation because a complicated app can involve many blocks. Although one can collapse the view to minimize the space taken by each group of blocks, it is difficult to get a full-view of all blocks when one needs to skim through and identify problems—it requires much scrolling vertically and horizontally on the page/screen. Another limitation of AI, as one student mentioned, is the constraint of layout of interface components—AI allows very little control over how and where components are placed on the development screen.

In addition, students who are more advanced hoped for the ability to edit the Java (i.e., the original programming language used for developing Android mobile apps) text code directly: « You are not able to toggle between blocks view and the actual code. I think it would be a very useful way to learn code design. »

This comment is particularly pertinent to advanced app developers who want to develop highly customized apps. It is also relevant to educators interested in teaching programming and using AI as a stepping-stone for teaching advanced textual programming languages. Although AI is a sophisticated and powerful web-based program that allows people to build complicated apps, developers who use AI need to work within the provided blocks and features offered by the AI environment. One tool called App Inventor Java Bridge does allow developers to import App Inventor components into the authentic Android SDK (software development kit) environment of text codes, but it is not built into the App Inventor environment and requires extra effort to make the transition.

Instructional Design Implications and Suggestions

The integration of multiple online learning environments and learning activities was overall positively recognized by the students in this class. The students also appreciated AI as a great tool to help them develop a functioning app and develop programming logic. The sense of achievement was also high when apps were completed. Together, these various components helped support non-programmer adults learn mobile app design through visual programming in a virtual learning community, where they contributed to each other's learning growth as mobile app designers. However, students' learning experiences can still be improved by factoring in their feedback and challenges encountered in this class.

More Time for Developing App Design Ideas and Proposal

Some students felt they needed more time on the design proposal, and one week was a bit rushed. While in this course students continued developing ideas and tweaking their design with one week designated for interface design and another week for working on the blocks, the instructor should consider arranging students' submissions of revised proposals to allow them to think through and incorporate peers' feedback. Giving more time for planning on paper could also help students reduce potential obstacles to programming app behaviors in blocks. The proposal was scheduled at the 11th week of the 16-week semester; however, instructors could assign the first draft due earlier (e.g., around the 6th week, one-third of the semester), and the second draft due around the 11th week (two-thirds of the semester), which would allow students to update their plans as they became more advanced in app design skills. The two-stage method would allow students to reflect on their growth in learning and changes of ideas connected to app design journal activities.

Design Journal (Blogging)

While many students found it beneficial to keep a design journal through blogging, some students found it overlapped with the weekly online discussion forum activities. Instructors might want to provide more specific instruction/suggestions on what to focus on in respective assignments. For example, in forum discussions (where students shared their completed app customizations), students can focus on describing and critiquing the technical aspects, or problems encountered during their customizations. In the app design journal, instructors might want to be specific about what to cover, such as how to connect the apps they design to teaching and learning, self-reflection on one's growth and struggle as an app designer, what students have learned from their peers' work and ideas, and/or documenting web resources for app design. In addition, while journal writing has been established as an approach of internal conversation for individual knowledge construction, instructors can consider encouraging students to extend it to collaborative knowledge construction by viewing and providing feedback on peers' reflective practice, which can potentially further enhance learning experiences. With the help of blogging platforms that afford participatory learning through

subscription and commenting functions, collaborative knowledge construction can be further strengthened among the members of the virtual learning community (Hsu, Ching, & Grabowski, 2013).

Engaging in External Online Learning Communities

Although students in this course were supported by the instructor and in-class learning community, educators would want to encourage students to join or participate in the established online discussion forums on mobile app design with App Inventor, such as Programming with App Inventor or App Inventor Coffee Shop. These forums consist of passionate and knowledgeable members with experience in mobile app design, and are widely available and accessible through a quick Google search. While the in-class forums offered a safe and comfortable place for sharing apps and exposing one's gap in knowledge, outside discussion forums can offer inspiration and solutions to problems not readily available in small-class environments. Additionally, extending one's learning community can help sustain learning opportunities and motivate students to continue the mobile app design journey with renewed interests and purposes.

Capturing the Questions and Need to Prepare for the Future

While students' activities, such as forum discussions and design journals, can sustain current students' in-class learning, reviewing students' activities can also help instructors capture useful information for preparing some form of "Frequently Asked Questions" and "Tips for the Week" for future students. While it is important to have students learn by solving design problems, providing organized tips can be helpful for novices when multiple technical issues can develop and become frustrating to students.

Conclusions

In this study, we presented non-programmer adult students' learning experiences and perceptions toward mobile app design using a web-based visual programming tool in an online graduate course. We found the students were positive about their online learning experiences. They also appreciated the rich peer support in this virtual learning community, which consisted of multiple online learning environments and activities that supplemented each other. In addition, they recognized the great sense of empowerment and achievement for being able to use a programming tool to create something useful that might not have existed before, or to use the tool or apps in their own daily personal or professional settings. While the students felt constrained by the inflexible interface of App Inventor on the Component Designer, and felt inconvenienced in reviewing programming blocks when their apps became too complicated, most students commented highly on its sophistication and capability to unleash their creativity and create something fully functioning, fun, and useful. Finally, we discussed instructional design implications based on students' feedback and the instructor's own reflection. We hope the study presented here showed a promising

example of teaching non-programmer adults mobile app design by integrating various components that supplemented each other to create a positive online learning experience. We also believe this study depicts the power and potential of the web-based App Inventor programming tool for motivating students to learn programming logic and encourage students to engage in creative problem solving through mobile app design activities. This study shows the educational value of mobile app design activities, and the possibility and practicality of teaching/learning mobile app design online, which can further encourage educators to explore and experiment on the potential of incorporating these learning activities in their diverse settings. However, we would like to acknowledge the small sample size of our study and remind readers to interpret our findings with caution. We would also like to encourage future research replicating our study with students of similar or different backgrounds and learning contexts to validate our findings and benefit educators and their students.

References

Baker, A., Jensen, P., & Kolb, D. (2002). *Conversational learning: An experiential approach to knowledge creation.* London: Quorum.

Carnegie Mellon University (2008). What is Alice? Retrieved from http://www.alice.org/index.php?page=what_is_alice/what_is_alice.

Ferdig, R., & Trammell, K. (2004). Content delivery in the 'blogosphere.' *T.H.E. Journal.* Retrieved from http://www.thejournal.com/articles/16626

Glinert, E. P. (1986). Towards "second generation" interactive, graphical programming environments. *Proceedings of 2nd IEEE Computer Society Workshop on Visual Languages*, Dallas, Texas, USA.

Hsu, Y. -C., & Ching, Y. -H. (2011). Microblogging for strengthening a virtual learning community in an online course. *Knowledge Management & E-Learning: An International Journal, 3*(4), 375-388.

Hsu, Y. -C., & Ching, Y. -H. (2012). Mobile microblogging: Using Twitter and mobile devices in an online course to promote learning in authentic contexts. *The International Review of Research in Open and Distance Learning, 13*(4), 211-227.

Hsu, Y. -C., Ching, Y. -H., & Grabowski, B. (2013). Web 2.0 applications and practices for learning through collaboration. In M. Spector, D. Merrill, J. Elen & M. J. Bishop (Eds.), *Handbook of research on educational communications and technology* (4th ed.). New York, NY: Springer Academics.

Hsu, Y. -C., Rice, K., & Dawley, L. (2012). Empowering educators with Google's Android App Inventor: An online workshop in mobile app design. *British Journal of Educational Technology, 43*(1), E1-E5. doi:10.1111/j.1467-8535.2011.01241.x

Johnson, L., Levine, A., Smith, R., & Stone, S. (2010). *The 2010 horizon report.* Austin, Texas: The New Media Consortium.

Johnson, L., Adams, S., & Cummins, M. (2012). *Mobile apps. The NMC horizon report: 2012 higher education edition.* Austin, Texas: The New Media Consortium.

Ladyshewsky, R. K., & Gardner, P. (2008). Peer assisted learning and blogging: A strategy to promote reflective practice during clinical fieldwork. *Australasian Journal of Educational Technology, 24*(3), 241–257.

Lock, J. (2002). Laying the groundwork for the development of learning communities within online courses. *The Quarterly Review of Distance Education, 3*(4), 395-408.

Lifelong Kindergarten Group (2006). About Scratch. Retrieved from http://info.scratch.mit.edu/About_Scratch.

Margulieux, L. E., Guzdial, M., & Catrambone, R. (2012). Subgoal-labeled instructional material improves performance and transfer in learning to develop mobile applications. *Proceedings of the ninth annual international conference on International computing education research - ICER '12*, 71. doi:10.1145/2361276.2361291

McKelvey, N., & Curran, K (2012). Teaching Java programming using CABLE in a collaborative online environment. *International Journal of Evaluation and Research in Education, 1*(1), 33-40.

Massachusetts Institute of Technology (2012). App inventor stories. Retrieved from http://appinventor.mit.edu/explore/stories.html.

Morelli, R., Lake, P., Limardo, N., & Tamotsu, E. (2011). Can Android App Inventor bring computational thinking to K-12? *Computer*. Retrieved from http://www.hfoss.org/uploads/docs/appinventor_manuscript.pdf

Rovai, A. P. (2002a). Development of an instrument to measure classroom community. *The Internet and Higher Education, 5*, 197-211.

Rovai, A. P. (2002b). Sense of community, perceived cognitive learning, and persistence in asynchronous learning networks. *The Internet and Higher Education, 5*, 319-332.

Sia, C. L., Tan, B. C. Y., & Wei, K. K. (2002). Group polarization and computer-mediated communication: Effects of communication cues, social presence, and anonymity. *Information Systems Research, 13*(1), 70–90.

Shoffner, M. (2009). Personal attitudes and technology: Implications for pre-service teacher reflective practice. *Teacher Educational Quarterly, 36*(2), 143-161.

Shumack, K. (2010). The conversational self : Structured reflection using journal writings. *Journal of Research Practice, 6*(2), 1–22.

Turbak, F., Sandu, S., Kotsopoulos, O., Erdman, E., Davis, E., & Chadha, K. (2012). Blocks languages for creating tangible artifacts. *The Proceedings of IEEE Symposium on Visual Languages and Human-Centric Computing* (VLHCC 2012), Innsbruck, Austria. Retrieved from http://cs.wellesley.edu/~fturbak/pubs/VLHCC-2012-paper-turbak.pdf.

Wang, W. (2011), *Teaching programming online*. International conference on the future of education. Retrieved from http://www.pixel-online.net/edu_future/common/download/Paper_pdf/ELE19-Wang.pdf

Wikipedia (2013a). App Store (iOS). Retrieved from
http://en.wikipedia.org/wiki/App_Store_%28iOS%29.

Wikipedia (2013b). Google Play. Retrieved from
http://en.wikipedia.org/wiki/Google_play.

Wolber, D. (2010). A blocks language for mobile phones: App Inventor for Android. In
E. Canessa & M. Zennaro (Eds.), *mScience*: *Sensing, computing and
dissemination*. Trieste, Italy : ICTP—The Abdus Salam International Centre for
Theoretical Physics.

Wolber, D. (2011). App inventor and real-world motivation. *Proceedings of the 42nd
ACM technical symposium on Computer science education SIGCSE 11* (p. 601).
ACM Press. doi:10.1145/1953163.1953329

Wolber, D., Abelson, H., Spurtus, E., & Looney, L. (2011). *App Inventor: Create your
own Android apps.* Sabastopol, CA: O'Reilly Media.

Athabasca University

Learning in a Small, Task–Oriented, Connectivist MOOC: Pedagogical Issues and Implications for Higher Education

Jenny Mackness[1], Marion Waite[2], George Roberts[2], and **Elizabeth Lovegrove[2]**
[1]Independent Education Consultant, UK, [2]Oxford Brookes University, UK

Abstract

Despite the increase in massive open online courses (MOOCs), evidence about the pedagogy of learning in MOOCs remains limited. This paper reports on an investigation into the pedagogy in one MOOC - Oxford Brookes University's 'First Steps in Learning and Teaching in Higher Education' MOOC (FSLT12).

FSLT12 was an open and free professional development opportunity for people moving into HE teaching. It was a small course (200 participants registered from 24 countries) which was focused on introducing HE teaching skills, and, uniquely, to deliberately integrate open academic practice as a vital part of professional development for HE teachers. A qualitative, case-study approach was used in the research, based on surveys, interviews, and social media, to provide evidence about how people learned in this course and consider wider implications for teaching and learning in higher education.

The evidence shows that participants who completed the course were able to learn autonomously and navigate the distributed platforms and environments. The most challenging issues were acceptance of open academic practice and difficulty in establishing an academic identity in an unpredictable virtual environment. An interesting and significant feature of the course was the support for learners from a number of MOOC 'veterans' who served as role models and guides for less experienced MOOC learners.

The research shows that small task-oriented MOOCs can effectively support professional development of open academic practice.

Keywords: MOOCs; FSLT12; open academic practice; higher education; case study

Introduction

2012 saw many types of MOOCs offered openly and 'for free' by a variety of higher education institutions around the world. It was also the year in which the Oxford Centre for Staff and Learning Development (OCSLD) at Oxford Brookes University ran one of the UK's first MOOCs: First Steps in Learning and Teaching in Higher Education (FSLT12).

One of the aims of FSLT12 was to trial and evaluate a MOOC for open, autonomous, and interactive professional development. How people experienced this in FSLT12 was investigated through an analysis of participant engagement with

- connectivist MOOC (cMOOC) *learning principles* (autonomy, diversity, openness, and connectivity);
- cMOOC *activities* (aggregate, remix, repurpose, feed forward); and
- cMOOC *behaviours* (consumer, producer, learning from and with others, mentoring/teaching others, active observation).

cMOOCs are 'based on a philosophy of connectivism and networking' (Daniel, 2012) and 'are defined by a participative pedagogical model' (Siemens, 2012a).

Distributed platforms, autonomy, diversity, openness, and connectivity were identified by Downes and Siemens (conveners of the first cMOOC in 2008, CCK08) to be *key principles* for learning in networks (Downes, 2009a, 2013). Downes and Siemens have described four *key MOOC activities*: aggregation (filtering, selecting, and gathering personally meaningful information); remixing (interpreting the aggregated information and bringing to it personal perspectives and insights); repurposing (refashioning the information to suit personal purposes); and feeding forward (sharing the newly fashioned information with and learning from other participants) (Kop & Carroll, 2011). *Typical MOOC behaviours* were researched by Kop (2011). These principles and activities formed part of the basis for the design of the FSLT12 MOOC, and the research questions which provide a focus for this paper are:

- How did cMOOC design principles and activities in FSLT12 enable participant learning?
- What are the deeper implications for learning of the principles and activities used in the design of FSLT12?
- What are the possible implications of small task-oriented cMOOCs for higher education?

Background to the FSLT12 MOOC Development

A MOOC is a complex phenomenon leaving aspiring designers and conveners with many questions and decisions to make. The key question to answer is one of underlying pedagogy, which will inevitably affect the learning experience and learning itself (Sloep, 2012).

Mackness, Mak, and Williams (2010), following their experience of CCK08, had reservations about whether the process of translating Downes' four key principles (autonomy, diversity, openness, and interactivity/connectedness) into the reality of student experience was that straightforward. And Tschofen and Mackness (2012) showed that these characteristics are more complex to understand in relation to individual identity and experience than might first be realized.

The introduction of monstrously massive MOOCs or 'xMOOCs' (Downes, 2013a), such as edX and Coursera, which have attracted up to 150,000 participants, has further complicated the understanding of MOOCs. They have also increased the 'for or against' debate, in terms of whether or not people can learn effectively in MOOCs (Rees, 2013), and, in particular, in xMOOCs, which are viewed by Boxall (2012) as the online version of traditional instructivist correspondence courses, as opposed to cMOOCs which emphasize 'creation, creativity, autonomy and social networked learning' (Siemens, 2012b).

There are now many 'hybrid' MOOCs too (Roberts et al., 2013, Conole; 2013, Clark, 2013), including small MOOCs. Downes (2013b) suggests that for an open course to qualify as a MOOC, it must be 'massive' and that 'massive' refers to an open course where the active participants number more than Dunbar's number (c. 150). Lisa Lane (2012) suggests that MOOCs can be grouped into three types: network-, task- and content-based. FSLT12 had 206 registered participants and was designed as a small task-based MOOC.

Design for Learning in FSLT12

The pedagogical design of the FSLT12 MOOC was determined both by the perceived learning needs of the intended audience and by the need to align it with an established face-to-face course. Alignment was necessary in order to test whether the MOOC could be offered for credit in 2013. In 2012, it was run as a pilot with the award of a certificate of achievement only. Ultimately this certificate went to 14 participants (out of 60 consistently active participants) who opted for their completed tasks to be assessed by the MOOC conveners. They also received feedback from their peers. The FSLT12 MOOC was targeted at new lecturers, PhD students who teach, and people moving into HE from industry. It attracted participants new to HE and learning online, as well as MOOC 'veterans' and experienced lecturers (Waite et al., 2013). The six week course (Figure 1) was resource-based and task-oriented and aimed to develop and

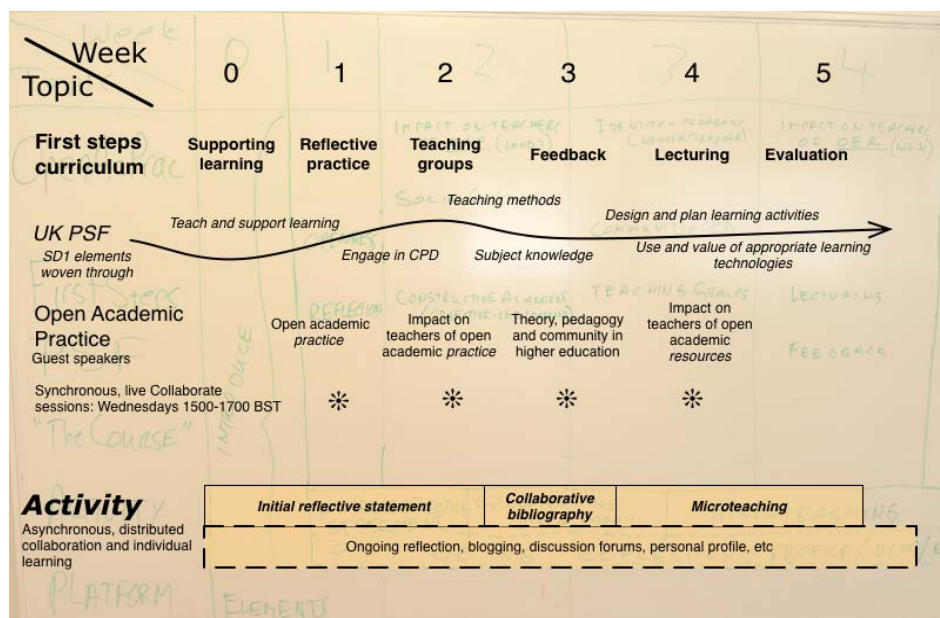extend knowledge, skills, and understanding of learning and teaching in higher education (Waite et al., 2013).

Figure 1: FSLT12 MOOC schedule.

Given that the MOOC was targeted at new HE lecturers, this MOOC intentionally created a more supportive learning environment than is encountered in some traditional cMOOCs such as ChangeMOOC. Not only were 'veterans' encouraged to support participants new to MOOCs and lecturing in HE, but the three tutors and three technologists also had a greater 'presence' than is customary in some traditional cMOOCs, providing individual and whole group support, particularly for those participants being assessed, and by monitoring discussions and providing feedback on completed tasks.

Of the 206 registered participants from 24 different countries 60 were active in the Moodle discussion forums throughout the 6 weeks that the course ran. Participants were encouraged to work across distributed sites and platforms of their choosing (Waite et al., 2013). A distributed environment is an essential element of cMOOCs in supporting autonomy, connectivity, and interaction (Daniels, 2012; Downes, 2009b). The course used Wordpress, Moodle, and Blackboard Collaborate platforms and participants' blogs were aggregated into the Wordpress site. Twitter was also used extensively: 832 tweets posted by 114 participants.

Each of the 5 weeks featured an editable collection of prepared resources, a series of discussion boards, and a live online session with a guest speaker. The last synchronous sessions of the course featured the course participants showcasing their 10-minute-long microteaching activities, sharing their practice, and offering each other feedback.

Integral to the course design was the expectation that knowledge would be co-created through active, autonomous participation and that learning would 'emerge' through the interactions around the key activities of aggregation, remixing, repurposing, and feeding forward. In the process, open academic practice (across 'teachers' and 'learners') becomes the overarching core (cMOOC) activity, and the four *key activities* (above) become *mechanisms* to achieve this.

Research Methodology and Data Collection in FSLT12

A qualitative, case-study approach was taken to the research and data. The University Research Ethics Committee granted approval and participants were informed about the authors' research intentions at the start of the MOOC. Data were collected through the use of surveys, focus groups, and semi-structured face-to-face and email interviews. Discussion forums, participant blogs, and a Twitter archive were also analysed for evidence of how participants learned.

Table 1

Data collection in FSLT12

Type of data collection	Questions focused on
Survey	Patterns and levels of participation in FSLT12 activities and online sites
Focus groups	Organisation of the FSLT12 MOOC, assessment, use of technology/activities, inclusive practice
One-to-one interviews with assessed participants	As above
Email interviews	The way participants learn in cMOOCs related to principles, activities and behaviours

This mixed method approach allowed for triangulation of the data and gave rigor to the case study (Waite et al., 2013).

Data were collected immediately following the end of the MOOC using an online evaluation questionnaire targeted at all participants (N = 21/206). At the time, 60 participants were active in the forums so 21 responses represents a 34% response rate. Two online synchronous focus groups were held within the Blackboard Collaborate environment. Face-to-face and Blackboard Collaborate semi-structured individual interviews were held for a targeted group of assessed participants (n = 4/14). Blog, Twitter, and Moodle discussion forum analysis was undertaken.

In most MOOCs the majority of participants (typically 80-90%, but 70% in FSLT12) are not visibly active and may be observing, reading, listening, or engaging in other ways (Rodriguez, 2012). Nevertheless, it is important to try and capture the voice of these participants if we are to fully understand how and what people learn in MOOCs. A further survey, with specific questions about modes of and reasons for different levels of participation, was therefore sent out by email to all registered participants ($N = 27/206$) and this was followed up with email interviews of those participants who agreed to this ($n = 7$).

Learning in FSLT12

The data were analysed from the perspective of MOOC learning principles, MOOC activities, and MOOC behaviours.

Autonomous Learning across Distributed Platforms

Working across distributed platforms allows learners considerable autonomy, but also requires the associated technical, navigation, and critical thinking skills. Learners new to MOOCs may find working across distributed platforms difficult and disorienting; experienced 'MOOCers' expect this (Waite et al., 2013).

Learners who were most successful fell into three groups: those who recognized the time commitment needed to learn new skills: 'There's a period of time which you have to devote to navigation' (interview*)*; those who were being assessed and were motivated through this commitment: 'Having an assessment piece really added value for me in terms of motivation and commitment' (first survey); or those who already had a personal enthusiasm for working autonomously.

One of the course conveners suggested that 'The development of autonomy benefits from scaffolding' (blog post), and a participant suggested inviting mentors to support novice 'MOOCers'. This suggestion was adopted for the next run of FSLT in 2013.

Although fostering autonomy was thought to be an essential part of the learning process and design, the constraints on autonomy were also recognized:

> Realistically, however, in the "real world" we do have deadlines, and we do have specific deliverables; so in essence we have a roadmap and constraints. (discussion forum)

Learning through Diversity

The diversity of participants was both valued and experienced as challenging:

> It was great to meet people from all over the world and share with all of them. (interview)

> [but ...]

> The mix of novices and experts is interesting. Fast pace of synchronous sessions and technology might exclude novices. There is also a culture to learn. (focus group)

A spontaneous discussion in one of the early discussion forums around a video posted by a participant (Higher Education and Social Justice – Jennifer Simpson) highlighted the importance of educating to 'deal with difference', but one participant noted that:

> Diversity diminishes during the course – posts drop off and ends up with a core group. (interview)

However, the high number of people who were just temporarily 'sampling' the course ('drop-outs', Watters, 2012), or actively observing ('lurkers') are legitimate parts of the diversity of the participant mix in open MOOCs. This makes the analysis of diversity, and sustaining diversity in MOOCs much more complex.

Learning Through Openness and Interactivity

Openness in FSLT12, in the sense of open sharing, featured in the content (a focus on open academic practice and open educational resources), discussion, and reflections of participants:

> One of the things about open academic practice... is "lifting the lid" on the reality of our work. (discussion forum)

In her live presentation to FSLT12 MOOC participants, Frances Bell said:

> I prefer to think of openness as a default option that can be turned off, not as a zealot's precept,

and in a related blog comment wrote:

> The challenge for 21st Century educators and learners is that they operate in a mixed public/private arena where ideas may be exchanged in a quasi-private arena but shared or fed to more public arenas.

Openness was seen as important to the future of higher education, but also difficult to achieve, particularly in relation to assessment.

> By taking part in open initiatives any way -- as an instructor, course designer, student, blogger, drive-by commentator, or even just an interviewee for a research project -- we are part of the collaborative effort to imagine, create, test, and improve the future of higher education for teachers, students, and society at large. (follow up evaluation)

> It's probably quite difficult to give honest, critical feedback on microteaching without hurting people's feelings, especially when relationship is entirely virtual?
> ... I'm guessing tendency is to go softly, to err on the side of not crushing people's efforts. (focus group)

Interactivity between FSLT12 participants was supported for many by the live synchronous online webinars: 'They make me feel more connected to real people'; 'There is no substitute for actually talking with people' (follow up evaluation). Hearing people's voices, engaging in the 'chat', connecting with others to ask for help, social conversations, and, for four participants, a face-to-face meeting were all thought to contribute to connectivity. One participant asked in a discussion forum 'So is learning all about the connections we make?'

For others, lurking and limited openness were seen as important options.

> This (active lurking) was probably my most dominant behaviour due to time commitments. I was mainly in the background, watching with interest, thinking and pondering... But I am glad I had the chance to even lurk, to see the organization of the event and consider how this could be used in my own practice... To be honest I think that many will lurk in these events, but that doesn't mean they are not valuable learning experiences... It was legitimate and peripheral and I was part of the community and when I could attend the live event I joined in the dialogue. I guess the issue for organizers is how much resource can you put in to something where majority may lurk – how can you appease funders that this is a worthy and valuable activity. Because it is/was. (email interview)

Organising Learning Through Aggregation

Aggregation was an integral element of the FSLT12 design. Participant blogs were aggregated into the Wordpress site and wikis were designed into each of the week's content for the aggregation of open educational resources and participants' completed tasks.

Participants also aggregated their own resources through a Twitter archive, a Google map, a personal wiki, a personal blog roll, Word documents and folders, use of Google Reader, Diigo, bookmarking, and the creation of a list of useful links. Many of these aggregated resources were openly shared. As one participant wrote on her blog about the Twitter archive she created:

> The archive enables us to revisit comments and links shared via Twitter at any point and essentially it becomes part of our memory... At a later stage it could provide some meaningful data on: the virtual connections participants made; the kind of links we shared; what kind of information we shared.

Another participant valued blogging for aggregation, 'Blogging integrates everything to me' (follow up evaluation) and blogs were also seen by one commenter as preferable to discussion forums for being searchable:

> I would not have seen this question (or other stuff you have written in the interim) if it had been locked away in a discussion forum. So I hope you continue blogging. (comment on a participant blog)

Co-Creation and Creativity through Remixing and Repurposing

As would be expected in a MOOC focusing on teaching and learning in Higher Education, many academic references were posted and one of the assessment tasks required the co-creation of an annotated bibliography. The question was raised on one participant blog as to whether we now have a copy and paste culture and whether remixing equates to plagiarism.

There was also evidence in FSLT12, but less so, of repurposing resources. This was promoted in particular by the final microteaching activity, which was completed by those being assessed, but also by some non-assessed participants. Some participants repurposed their own past work to fit the assessment requirements, but others created their presentations from scratch. One participant explained her repurposing as follows:

> For my FSLT12 microteaching, I'd like to share a mash-up that includes Luis Moll's Funds of Knowledge, Jim

Cummins's and Dennis Sayers's collaborative critical inquiry, blogging, VoiceThread, and Second Life. Inspired by my other summer MOOC, Digital Storytelling 106, I've created a video to share the story of this pedagogical pattern that I've tested multiple times in my online teaching of ECI 521, Teaching Literature for Young Adults. (participant blog)

Coping with Uncertainty and Identity Building

Connectivist MOOCs may be pedagogically disruptive (Downes, 2013c) and this can have a significant impact on participant learning experiences and sense of personal identity. As one participant put it:

> A MOOC allows me to play with uncertainty and depending on how my day is going, that can be scary or liberating. (discussion forum)

Another participant wrote:

> This is my 4th or 5th MOOC and I have yet to work out what the damn thing is "for" or even why exactly I'm here. As a description I'd say this is a place where the challenge of the unexpected happens in an environment populated with thoughtful people (pleasurable place to be) and the path I follow to understanding is mine to decide. Funny, but all my life I've heard "don't worry, someday it will all come together" when something was beyond my understanding and not worth hammering into my thick head at the time. As I get older, that statement feels less like a declaration that understanding will emerge from following the exact steps that lost me in the first place and more like a prediction that somehow sense can be made—even if path to it only makes sense to me. A MOOC is education that comes to me to be processed as I choose. Were it strictly defined as a "course" this approach would likely lead me well away from the understanding the outcomes promised me in the catalogue. (discussion forum)

And yet another:

> I think dealing with uncertainty AND dealing with criticism are good requirements for both academics and non-academics alike. (discussion forum)

All three of these comments were made by experienced 'MOOCers'. Participants new to MOOCs prefer a more linear, structured environment, with 'plain language, numbers or map of something'. As one participant expressed it:

> A good MOOC creates 'safe space' to experiment, risk, trust, fail, try again. ...There is something massive here about how less structured, less controlled perspective on MOOCs will feel uncomfortable for learners used to being spoonfed/guided. Huge shift, we can't underestimate the level of discomfort associated. (focus group)

Some participants recognized the effect that a MOOC environment could have on their identity and how identity might change over time in unexpected ways:

> It changed my learner identities from confidence and experienced to not having a clue and feeling like a novice. (focus group)

Another participant recognized the relationship between working in different online environments and identity:

> We sit in multiple places at once. Each tab on the browser represents a different aspect of oneself interacting with others. In any one day we sit as broadcasters, friends, intimates, eavesdroppers and audience, oftentimes switching between modes of being-with within seconds. (focus group)

Emerging Pedagogical Issues

The data analysis revealed four significant pedagogical issues for learning in FSLT12.

1. Learning across distributed platforms

Learning in cMOOCs usually takes place over distributed platforms. The premise of a cMOOC is that in an age of plentiful and open information, learners cannot hope to commit this information to memory and must instead build and maintain a network of connections for easy reference (Siemens, 2004). Downes (2009) posits that knowledge is in the network. Learners must develop the skills of finding relevant information, critical analysis, synthesis, and meaning making. They need to become adept at filtering and selecting from the wealth of information that is available and to develop high levels of critical capability (Kop & Bouchard, 2011).

We found that many learners find the abundance of information now accessible through the internet overwhelming. Despite this, active learners can, with support, develop

appropriate technical skills to be able to engage with online content. They can become producers of multi-media content, aggregating, remixing, and repurposing resources they find through their online connections. They also gain the confidence to attend and contribute to live synchronous sessions, to openly share their work and ideas, and to cooperate and/or collaborate in social networking environments. They shift from being consumers to producers (Kop & Carroll, 2011). Technical skills are important but Anderson (2009) stresses the importance of pedagogy. With a balance between technology and pedagogy, learning can flourish, through interaction and collaboration (Kop & Carroll, 2011).

2. Social construction of knowledge

Active participants in FSLT12 understood that social construction of knowledge is a key element of MOOCs. Learning in MOOCs is less reliant on the teacher and depends to a large extent on the connections that people make, both to the content and to each other, and on the negotiation of meaning. In FSLT12 the 'veteran' MOOCers provided significant support for those new to learning in MOOCs (Waite et al., 2013).

The idea that learners negotiate meaning through social interaction is not new. Seely Brown (2008) in discussing the impact of the internet on learning writes:

> ... our understanding of content is socially constructed through conversations about that content and grounded interactions, especially with others, around problems or actions. The focus is not much on what we are learning but on how we are learning.

Wenger has also discussed this in depth in relation to his social theory of learning (1998). For Wenger the term 'negotiation' conveys 'a flavour of continuous interaction, of gradual achievement, and of give-and-take' (1998, p. 53). More recently Wenger's work has focused on learning citizenship (2009) which means that as citizens, learners must know how to engage in social learning spaces, know when to disengage from a learning space and move on, know how to work across boundaries and between spaces, and know how to convene a community of practice.

However, Anderson and Dron (2011) point out that 'learning in connectivist space is, paradoxically, plagued by lack of connection' and that learners can be 'lost in social space' (Dron & Anderson, 2009). The ability to make connections and negotiate learning cannot be assumed by learners, teachers, or course designers. Learners need to be self-motivated and self-directed (Kop & Fournier, 2011).

3. Open academic practice and building an identity

Connective practices also have profound implications for open academic practice and identity, which several participants in FSLT12 recognised.

Martin Weller (2011) sees openness as a 'state of mind' and necessary for scholarly practice, but as Burton (2009) points out:

> a typical scholar is very exclusive, available only to students in specific academic programs or through toll-access scholarly publications that are essentially unavailable to all but the most privileged.

Burton believes that 'the Open Scholar is someone who makes their intellectual projects and processes digitally visible'. This has significant implications for academic research and publication, but also, more importantly, for academic identity.

Barnett (2007) writes that:

> 'Being' has to be claimed as a key concept in any serious reflection on higher education, especially any thinking concerned with students and their experience. It is through her being that the student comes into a relationship or, rather, a set of relationships with all that she encounters.

According to Wenger (1998) learning, meaning, and identity are inextricably intertwined and 'Building an identity consists of negotiating the meanings of our experience' (p. 145). But meaning making and identity formation across distributed networks and in an age of information abundance, complexity, and uncertainty means that today's learner has 'a tough time of it' (Barnett, 2007, p. 36). These days we have to manage multiple trajectories all at once. It's hard work (Wenger, 2011).

> Mastery of learning requires understanding the struggle of what it takes to become something. (Wenger, personal communication, 2012*)*

4. Embracing uncertainty

Nowhere is this struggle more apparent than in connectivist learning environments. To be successful, learners in a cMOOC need to embrace this uncertainty (Cormier, 2012). There will be times for teachers/facilitators/MOOC conveners and learners when levels of uncertainty, risk, and unpredictability are so high as to make the learning experience feel 'scary' and unsafe. However, as learners become more familiar with working in less structured, open, diverse, and connected environments, learning is more likely to be experienced as 'sweet' emergence (Williams, Mackness, & Gumtau, 2012).

FSLT12 MOOC exposed learners to many of these new ways of learning. They worked across distributed platforms, aggregating, remixing, repurposing, and openly sharing resources. They were exposed to an uncertain and unpredictable environment, in which it was expected that learning and to some extent the curriculum itself would be

emergent (Williams, Mackness, & Gumtau, 2012). As the course progressed and with the support of tutors and experienced 'MOOCers', participants became more accepting of uncertainty and increased in confidence as open academic practitioners.

Conclusions and Implications for Higher Education

Whilst the findings of this research cannot be generalised due to the small sample size, it is possible to draw some tentative conclusions, which might have implications for academic practice in higher education.

How FSLT12 Design Principles and Activities Enabled Participant Learning

Participants who remained active throughout FSLT12 were those who were, or who learned to be, autonomous, open, connected, and interactive. They also demonstrated the technical skills required to navigate across distributed environments, filter, select, and aggregate the resources, and remix, repurpose, and feed forward artefacts and learning.

The diversity of the participant group and, in particular, the participation of 'veteran MOOCers' was significant in supporting those who were new to a MOOC (Waite et al., 2013). However, as one participant said: 'Diversity diminishes during the course – posts drop off and ends up with a core group' (interview). This suggests that whilst MOOCs such as FSLT12 might start, even with the support of 'veteran MOOCers', close to the edge of chaos, they become by the end of the course more like a community of practice.

The Deeper Implications for Learning of the Principles and Activities Used in the Design of FSLT12

Most challenging for all participants, whether experienced or inexperienced 'MOOCers', were issues around coping with uncertainty, openness, and academic identity. MOOCs have been described by Yuan and Powell (2013) as intimidating, complex, and confusing. For academics and researchers, particularly those new in post who are learning to teach and trying to establish a reputation, openness can be a risk. FSLT12 tasks required participants to work, learn, and teach in an open environment.

The consistent, active engagement of a number of MOOC 'veterans' and the fact that this was a small, task-oriented MOOC were important in supporting FSLT12 participants to cope with uncertainty and to develop as open academic practitioners.

The Possible Implications of Small Task-Oriented cMOOCs for Higher Education

The evidence from FSLT12 suggests that there are learning gains to be had from opening a course, particularly if it attracts veteran 'MOOCers', who support the teaching/facilitation process. In challenging traditional ways of thinking and working in higher education, cMOOCs have the potential to improve teaching and encourage innovation and new pedagogical practices (Yuan & Powell, 2013).

FSLT12 was offered free to the world, but required new online platforms to be designed and a team of six to plan and run the MOOC. It was run as a pilot and was financially viable because it received funding from the JISC/HEA, but this funding did not continue for the second run of the MOOC in 2013. Despite this, for 2013 the course was formally accredited by Oxford Brookes University as a 10 credit module at Level 7 (postgraduate level). However, charging for accreditation increases the administrative costs of running the MOOC. Drop out rates become more of a concern and there are cost implications for platform security, 'tracking' participants and working with unregistered participants. Quality assurance is a challenge' (Reilly & Von Munkwitz-Smith, 2013).

Introducing MOOCs into the higher education curriculum also has implications for how teaching and scholarship are perceived and understood: 'Pedagogy itself is an implication of MOOCs' (Yuan & Powell, 2013; Clar & Barber, 2013). Increased participant numbers on an open online course or MOOC, the majority of whom are not registered for assessment or might not be formally registered at all, requires a change in approaches to teaching. The teacher can no longer have a one-to-one relationship with each participant. Some open online courses (such as EC&1 831) call for voluntary mentors to support participants new to working in MOOCs, but this in turn has implications for the quality of critical feedback, as does peer assessment, which is how many xMOOCs have addressed this problem. In 2013 the FSLT MOOC, which was offered for credit, sought the help of FSLT12 alumni in supporting participants and providing feedback. The quality of this feedback has not yet been evaluated.

MOOC conveners may also need to rethink their pedagogical approach depending on the size and type of MOOC they are running. If learner autonomy is a key element of a MOOC environment, then this has implications for the design of tasks and expectations of completion, especially if those tasks are to be assessed. In addition, if the expectation is that MOOC participants will remix and repurpose information they find through their MOOC connections or on the Web, plagiarism and scholarly integrity may become a concern. Plagiarism was not an issue in FSLT12, but has been noted in some xMOOCs (Daniel, 2012).

MOOCs present institutions with political, economic, organizational, and, most importantly, pedagogical challenges. The pedagogical approach of the massive xMOOCs is currently under scrutiny since some research suggests that large-scale lectures and demonstrations do not support learner understanding (Mazur, 2012; Daniel, 2012).

Small task-oriented cMOOCs, such as FSLT12, may be a better option for higher education institutions committed to opening their courses and promoting open academic practice. These institutions can blend well-established face-to-face courses with an open online course to build on and enhance their existing reputation and retain the uniqueness of their expertise.

As a small task-oriented MOOC, FSLT12 created the opportunities and means for more shared and more open engagement with thoughts in progress, right through to knowledge creation, within an emerging peer group. This exposed participants to the experience, and hopefully the benefits, of at least some aspects of open academic practice, and each participant was free to interpret this in his/her own way.

Quality learning was thus achieved through a focus on academic identity and open academic practice; registration of a diverse mix of learners; optional assessment, which was designed to focus on remixing and repurposing thus encouraging commitment, innovation, and creativity; and learner autonomy, which allows for learners to determine their own learning paths and levels of engagement.

FSLT12 serves as an example of an emerging type of cMOOC, which one might call an open professional development MOOC.

> It was illuminating and empowering at the same time to
> learn in such a clear way the value of CPD, reflection and
> what professionalism means. (follow up evaluation)

Acknowledgement

References

Anderson, T. (2009). The dance of technology and pedagogy in self-paced instructions. *AU Space*. Retrieved from http://hdl.handle.net/2149/2210

Anderson, T., & Dron, J. (2011). Three generations of distance education pedagogy. *IRRODL*, *12*(3). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/890

Barnett, R. (2007). *A will to learn: Being a student in an age of uncertainty*. Open University Press.

Boxall, M. (2012). MOOCs: A massive opportunity for higher education, or digital hype? *Higher Education Network*. Retrieved from http://www.guardian.co.uk/higher-education-network/blog/2012/aug/08/mooc-coursera-higher-education-investment

Burton G. (2009). *The open scholar.* Retrieved from http://www.academicevolution.com/2009/08/the-open-scholar.html

Clar, M., & Barber, E. (2013). Learning online: Massive open online courses (MOOCs), connectivism and cultural psychology. *Distance Education*, *34*(1), 129-136.

Clark, D. (2013). *MOOCs: Taxonomy of 8 types of MOOC.* Retrieved from http://donaldclarkplanb.blogspot.ca/2013/04/moocs-taxonomy-of-8-types-of-mooc.html

Conole, G. (2013). MOOCs as disruptive technologies: Strategies for enhancing the learner experience and quality of MOOCs. *e-Lis.* Retrieved from http://eprints.rclis.org/19388/

Cormier, D. (2012). *Embracing uncertainty and the strange problem of habituation.* Retrieved from http://davecormier.com/edblog/2012/01/26/embracing-uncertainty-and-the-strange-problem-of-habituation/

Daniel, Sir J. (2012). Making sense of MOOCs: Musings in a maze of myth, paradox and possibility. *JIME*. Retrieved from: http://www-jime.open.ac.uk/jime/article/viewArticle/2012-18/html

Downes, S. (2009). *What connectivism is.* Retrieved from http://halfanhour.blogspot.co.uk/2007/02/what-connectivism-is.html

Downes, S. (2009a). *Connectivism dynamics in communities.* Retrieved from http://halfanhour.blogspot.com/2009/02/connectivist-dynamics-in-communities.html

Downes, S. (2009b). *Access2OER: The CCK08 solution*. Retrieved from
http://halfanhour.blogspot.co.uk/2009/02/access2oer-cck08-solution.html

Downes, S. (2013). *The quality of massive open online courses.* Retrieved from
http://mooc.efquel.org/week-2-the-quality-of-massive-open-online-courses-by-stephen-downes/

Downes, S. (2013a). *What the 'x' in 'xMOOC' stands for*. Retrieved from
https://plus.google.com/109526159908242471749/posts/LEwaKxL2MaM

Downes, S. (2013b). *What makes a MOOC massive?* Retrieved from
http://halfanhour.blogspot.co.uk/2013/01/what-makes-mooc-massive.html

Downes, S. (2013c). *The great rebranding.* Retrieved from
http://halfanhour.blogspot.ca/2013/04/the-great-rebranding.html

Dron, J., & Anderson, T. (2009). Lost in social space: Information retrieval issues in Web 1.5. *Journal of Digital Information, 10*(2).

Kop, R. (2011). The challenges to connectivist learning on open online networks: Learning experiences during a massive open online course. *IRRODL, 12*(3), 19-38.

Kop, R., & Bouchard, P. (2011). The role of adult educators in the age of social media. In M. Thomas (Ed.), *Digital education: Opportunities for social collaboration* (pp. 61-80). New York: Palgrave Macmillan.

Kop, R., & Carroll, F. (2011). Cloud computing and creativity: Learning on a massive open online course. *EURODL*, 1–11. Retrieved from
http://www.eurodl.org/?p=special&sp=articles&inum=2&article=457

Kop, R., & Fournier, H. (2011). New dimensions to self-directed learning in an open networked learning environment. *International Journal of Self-Directed Learning, 7*(2).

Lane, L. (2012). *Three kinds of MOOCs.* Retrieved from
http://lisahistory.net/wordpress/2012/08/three-kinds-of-moocs/

Mackness, J., Mak, S., Fai, John, & Williams, R. (2010). The ideals and reality of participating in a MOOC. *Networked Learning Conference, Aarlborg.* Retrieved from
http://www.lancs.ac.uk/fss/organisations/netlc/past/nlc2010/abstracts/Mackness.html

Mazur, E. (2012). *The scientific approach to teaching: Research as a basis for course design.* Opening keynote presentation to ALT-C 2012 conference.

Rees, J. (2013). *The MOOC racket.* Retrieved from http://www.slate.com/articles/technology/future_tense/2013/07/moocs_could_be_disastrous_for_students_and_professors.html

Reilly, M., & Von Munkwitz-Smith, J. (2013). Helping to take the disruptive out of MOOCs. *EDUCAUSE Review.*

Roberts, G., Mackness, J., Waite, M., & Lovegrove, E. (2013). x v c: Hybrid learning in, through and about MOOCs. In *Proceedings of OER13: Creating a Virtuous Circle.* Nottingham, England. Retrieved from http://openbrookes.net/firststeps12/research/dissemination/

Rodriguez, C. O. (2012). MOOCs and the AI-Stanford like courses: Two successful and distinct course formats for massive open online courses. Retrieved from http://www.eurodl.org/materials/contrib/2012/Rodriguez.pdf

Seely Brown, J., & Adler, R.P. (2008). Minds on fire: Open education, the long tail, and Learning 2.0. *EDUCAUSE Review*, *43*(1), 16-32. Retrieved from http://www.educause.edu/ero/article/minds-fire-open-education-long-tail-and-learning-20

Siemens, G. (2004). *Connectivism. A Learning theory for a digital age.* Retrieved from http://www.elearnspace.org/Articles/connectivism.htm

Siemens, G. (2012a). *What is the theory that underpins our moocs?* Retrieved from http://www.elearnspace.org/blog/2012/06/03/what-is-the-theory-that-underpins-our-moocs/

Siemens, G. (2012b). *MOOCs are really a platform.* Retrieved from http://www.elearnspace.org/blog/2012/07/25/moocs-are-really-a-platform/

Sloep, P. (2012*). On two kinds of MOOCs.* Retrieved from http://pbsloep.blogspot.nl/2012/06/on-two-kinds-of-moocs.html

Tschofen, C., & Mackness, J. (2012). Connectivism and dimensions of individual experience. *IRRODL, 13*(1). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/1143

Waite, M., Mackness, J., Roberts, G., & Lovegrove, E. (2013, in press). Liminal participants & skilled orienteers: A case study of learner participation in a MOOC for new lecturers. *JOLT*

Watters, A. (2012). Dropping out of MOOCs. Is it really OK? *Inside Higher Ed.* Retrieved from http://www.insidehighered.com/blogs/hack-higher-education/dropping-out-moocs-it-really-okay

Weller, M. (2011). *The digitalsScholar. How technology is transforming academic practice.* Bloomsbury Academic.

Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*, Cambridge University Press, Cambridge.

Wenger, E. (2011). *Learning in and across landscapes of practice.* Presentation to Lancaster University Management School. Retrieved from http://www.lancs.ac.uk/celt/celtweb/ewenger

Williams, R., Mackness, J., & Gumtau, S. (2012). Footprints of emergence. *IRRODL.* Retrieved from: http://www.irrodl.org/index.php/irrodl/article/view/1267

Yuan, L., & Powell, S. (2013). Moocs and open education: Implications for higher education. *Cetis White Paper.* Retrieved from http://publications.cetis.ac.uk/2013/667

Athabasca University

Virtual Worlds: Relationship Between Real Life and Experience in Second Life

Scott P. Anstadt, Shannon Bradley, and **Ashley Burnette**
Florida Gulf Coast University, USA

Abstract

Due to the unique applications of virtual reality in many modern contexts, Second Life (SL) offers inimitable opportunities for research and exploration and experiential learning as part of a distance learning curriculum assignment. A review of current research regarding SL examined real world social influences in online interactions and what the effects on users may be. This aids students in understanding the social constructionist perceptions and worldview of those persons they may serve in social services. This suggests the importance of developing an understanding of the relationship between users' real life (RL) and their SL. Some research has begun to reveal the effectiveness of telecommunication and computer simulation with certain clients in the fields of mental health and social work, yet there is a lack of sufficient research done within the context of virtual worlds. The current study surveyed users of several educationally and health focused SIMS (simulations) as to what motivates their SL and RL interactions. The data explores associations between users' RL and their SL in several areas, potentially addressing the future role of educating social work students regarding research methodology in online virtual reality interactions. Implications for social work are discussed including engaging clients using incentives for social participation built into the SL milieu.

Keywords: Social work; virtual world; Second Life

Introduction

Multi-user virtual environments (MUVEs) are perceptual and interactive simulated worlds in which persons might discover lifestyles, traditions, and engagement in interactive conversations in a role-playing medium. MUVEs afford access to ongoing social interaction, information both in print and depicted through video casts, and integration of collaborative learning through group sharing and teambuilding efforts (Dillenbourg, Schneider, & Syneta, 2002). Unlike other forms of virtual education, MUVEs support synchronous communication, therefore approaching what might be seen as a learning discourse in a sense of community (Barab, Thomas, Dodge, Carteaux, & Tuzun, 2005; Bruckman, 1997; DeLucia, Francese, Passero, & Tottora, 2009). Major professional organizations in the field of educational technology, such as the New Media Consortium, the International Society for Technology in Education, and the Association for Educational Communications and Technology, actively use and study applications of MUVEs in educational programming.

As a well-known example of MUVEs, Second Life (SL) is used by over 200 educational institutions throughout the world. Developed by Linden Labs in 2003, SL estimates over 15 million users, and in any one point in time an average of about 50,000 (Baker, Wentz, & Woods, 2009). Individuals create avatars as virtual representations of their real physical selves which serve to navigate the virtual simulators ("SIMS") in the form of humans, animals, inanimate objects, or hybrids known as "furries" (Bell, Castranova, & Wagner, 2009, p. 23; Gottschalk, 2010).

As such, SL offers a rich 3D virtual world that provides an unprecedented context for research using a social constructionist learning theoretical framework within an "authentic" and "living" reality. Epitomizing social constructionist principles, users in SL have access to a vast array of tools and audiences for the creative construction of "world-building" (Aurilio, 2010; Dawley, 2009). Social constructionist theory contends that deeper knowledge structures are developed as people interact with their physical and social world and engage in building artifacts. The social construction of reality occurs as individuals and groups interact and this interaction is how social phenomena are created. Socially constructed reality is an ongoing, dynamic process, where culture intertwined with history is seen as the source of human thought and behavior. In social constructionist theory learning continuously occurs and cannot be separated from the social context, as the social context is at the center of meaning. The focus in social constructionist learning is on the artifacts or deeper knowledge created through the shared construction and collective generation and transmission of meaning through culture and history (Mutekwe, Ndofirepi, Maphosa, Wadesando, & Machingambi, 2013; Mills, 2012; Conners, 2009; SparkNotes Editors, 2006; Brooks, 2002; Pinkett, 2000; Shaw, 1995; Vygotsky, 1978).

In recent years online communities, or SIMs, have been studied for their prospects in education. SL has been found to be a forum for tangibly enhancing quality of student learning by creating an experience which includes multi-sensory environments

(Jarmon, Traphagan, & Mayrath, 2008; Riedl, Bronack, & Tashner, 2005; Squire & Jenkins, 2003) and collaboration in student team projects (Erlandson, Nelson, & Wilhelmina, 2010). SL features telling visual immersive components which helps students feel a greater sense of reality in the context of their learning. For this reason over 200 universities have a presence on SL. Here, classrooms in total can be run on SL and students may go out into the various SIMs for field trips, assimilated role-plays, and to gather information which can be experienced in both a visual and auditory manner. Therefore, the platform of SL can be incorporated into already established traditional classroom curriculum (Beltran, Sierra, Gutierrez, & Garzon-Castro, 2012; Damianakis, Climans, & Marziali,2009; Leonard, Withers, & Sherblom, 2011; Rockinson-Szapkiw & Walker, 2009). The context of education might include events which may exist in real life but are not as handily accessed. These include theater and visual arts, poetry, discussion groups, live entertainment, and self-help groups, among others.

In relation to distance learning and virtual educational environments, SL has garnered much attention among educationalists and researchers as a valuable learning platform for distance learning (Newman, Olle, & Bradley, 2012; Anderson & Dron, 2011; Aurilio, 2010; Sun, 2010; Dawley, 2009, p.113). Within the world of social work programs in higher education, SL has been increasingly integrated and utilized as an effective learning technology in distance education at University of Southern California, University of Georgia, Valdosta State University, Stanford University, East Carolina University, University at Buffalo, Indiana University, and University of Texas Arlington. Furthermore, current research in distance learning points to SL as providing an optimal framework for a virtual educational environment that exemplifies the embodiment of social constructionist principles (Mills, 2012; Aurilio, 2010; Conners, 2009). Additionally, SL provides an excellent platform for instructors to integrate scaffolding for students within their research, "as it is an amazing space for approaching research participants" (Conners, 2009, p. 103). Although educational institutions are increasingly including SL as a technology based tool in teaching and learning in distance education, there is a lack of research in guiding educators in course design and pedagogy within the SL environment (Mutekwe, Ndofirepi, Maphosa, Wadesando, & Machingambi, 2013; Edwards, 2012; Jha, 2012; Sun, 2012; Anderson & Dron, 2011; Conners, 2009; Dawley, 2009; Minocha & Roberts, 2008; Huang, 2002).

Dawley (2009, p. 117) offers "social network knowledge construction" as an emerging pedagogical framework that addresses the need for new strategies in teaching and learning within distance learning courses in virtual worlds, such as SL. This framework incorporates user-centered content, social networking, and virtual worlds in the teaching repertoire that can be utilized in both inworld and out-of-world activities and in cross communication. The social construction of knowledge in the virtual world affords the students the opportunity to display physical representations of their newly gained knowledge in a variety of formats that can be shared with others and accessed at any time, further extending learning and deeper knowledge construction in a dynamic, ongoing process.

For example, social work education has begun to make use of the virtual world format as a resource for achieving competence in the field. The Council on Social Work Education requires students to study human behavior in the social environment as well as assessment of clients using a biopsychsocial and spiritual format (Holloway, Black, Hoffman, & Pierce, n.d.) . To this end there are full SIMs of communities in which the residents role-play a lifestyle consistent with ethnic, cultural, and spiritual traditions, thus bridging the gap between virtual lives and client/consumers' real lives (Anstadt, Burnette, & Bradley, 2011,2012; Boelstorff, 2008; Eastwick & Gardner, 2009; Parti, 2008).

Included are SIM representations of over 100 religious and spiritual traditions supporting a wide number of offerings in discussion groups, experiential expression of cultural traditions, and authentic cultural and artistic presentations. Avatars are assigned a name of their own and with a unique meaning to the puppeteer behind the keyboard. Role play of characters in the social context by the avatar residents allows the puppeteers to live these cultures authentically in this second life. Students may assume an anonymous avatar character and likewise experiment in involving themselves within various cultural environments on SL without feeling self-conscious as they reflect upon their experience. In this manner students feel more at ease in approaching educated informants on their experiences living within and practicing particular national, spiritual, and cultural traditions. Discussions with these resident informants allow students to reformulate and reconstruct their own impressions based upon information gleaned and comparison/contrast with their own background experiences. Unlike real life institutions, most spiritual and cultural settings in Second Life are free and open to anyone who wishes to participate (Baker, Wentz, & Woods, 2009; Salmon, Nie, & Edirisingha, 2010), thus allowing students easy access to many social contexts, interviews, and ethnographic observations (Boellstorff, Nardi, Pearce, & Taylor, 2012)

Often, social workers and other human service workers face barriers to service which include distance from clients, time constraints, transportation, and access to services. The virtual world offers a potential solution to many of these barriers. For this reason, the coursework study of how SL and other virtual reality platforms may fit into social service delivery systems would be a fruitful way of developing virtual interventions within the applied field with clients. Budding social service students who participate in both the SL environment and in developing virtual field studies could add to the body of knowledge leading to the development of an array of social services which may be obtained through the distance platform. However, the vast expanse of the "metaverse" (internet universe of virtual reality) is still in its infancy, and research has just begun to explore the complex motivations and interactions of this rich virtual world.

Among the growing concepts that have been recently examined is that of the relationship between users' virtual lives and their RL qualities and characteristics. For instance, researchers in the field of virtual communications have questioned just how strong the influence of social mores, norms, and laws are in internet-based virtual realities such as SL (Boelstorff, 2008; Parti, 2008), what role accepted institutions,

such as education, play in online interaction and learning (Nesson & Nesson, 2008; Rockinson-Szapkiw & Walker, 2009; Vernon, et. al., 2009), and what determines user acceptance and engagement in virtual constructs (Fetscherin & Latteman, 2008; Tsan & Day, 2007). Additional research has begun to determine the uses of virtual technologies in social services and continues to measure the efficacy of utilizing this new medium to enhance interventions, service delivery, and social service education (McCarty & Clancy, 2002; Smokowski & Hartung, 2003; Vernon, et. al., 2009). It is through increasing knowledge of what educators themselves are seeking in SL while exploring the resources in SIMs devoted to the pursuit of academics and health related matters that social service students can examine the potential of SL as a forum for social networking and social resource management. This exploration process may then be used with clients who may otherwise be isolated from elements of a rich social interactive environment now at their fingertips in SL (Belisle & Bodur, 2010; Eastwick & Gardner, 2009; Gottschalk, 2010, p. 506; Isabella, 2007; Stalker, 2007). Understanding, or at least uncovering, the answers to these and other questions could help to determine the potential for using SL as an intervention tool for the helping professions and thus to be studied as an integral part of distance education.

Building on research questions proposed by previous studies in SL (Bell, et.al., 2009, p.73; Gottschalk, 2010), this research seeks to demonstrate how students of social services may design and use a method which examines if there are any initial associations between RL interests that bring users to educational and health related themed SL SIMs, what they seek and do once they are into SL, and the purpose it provides for them. Based on the social constructionist theory, the researchers queried selected participants' real lives and their SL experience using survey and interview collection. This study is therefore an example of an immersive research application in SL conducted by graduate social work students.

Method

Data collection conducted by the authors studying in the field of social work focused on both quantitative and qualitative data, and because few studies have been done which examine the associations between these particular variables, it was largely exploratory. The study employed the use of several technologies new to collecting data in social work research and attempted to stay true to the nature of social work through direct interviews using a completely unique medium—SL itself. Two of the authors were MSW graduate students in social work at a university in the southeastern U.S. under the mentorship of the instructor of a required research methods course.

Initial approval was obtained via an expedited review from the Internal Review Board before beginning data collection. Participants were comprised of SL users who were most likely to frequent educational SIMs, such as those run by universities. For the purposes of this study, it was presumed that because SL requires users to be over the

age of 18 to register, all participants were of legal age. Participants were users of SL who voluntarily selected to take the survey. Raw data was processed into SPSS and results analyzed using descriptive frequencies and crosstabs.

The qualitative survey was comprised of 37 questions related to the demographic information of the users and the purpose and quality of their activities and interactions in RL and SL (Appendix A) . The survey was created for the purpose of this study and consultation on the key areas of interest which survey questions were intended to gather was elicited from experienced users of SL, professors of education, health care, and social work from within SL, as well as potential consumers of the survey who had some knowledge of online virtual reality prior to the study. From the feedback, changes to the survey were made to include additional demographic information and to rearrange questions for ease of understanding and to avoid potential bias.

An additional qualitative component to the study was added in order to expand upon the knowledge gained from the survey questions. The decision was made to enhance findings secured from the quantitative data with the use of interviews of self-selected participants. It was thought formative impressions gleaned would be useful in future revisions of the survey instrument. This information was collected through a semi-structured, nine-question interview and discussion between the researchers' avatars and participants' avatars recorded in typed form (see Appendix B).

Distribution of the survey was controlled using an electronic "kiosk" which resembled a mailbox and which could be locked into place on SL SIMs. Initially, agreements were obtained from owners of educational and health oriented SIMs willing to allow kiosks to be placed on their virtual property. The owners of the SIMs consisted of SL presence of three universities which also existed in RL plus two that were exclusive to SL, two healthcare organizations in RL with a presence in SL, a hospice in SL, plus a SIM dedicated to accommodation services in both RL and SL for persons handicapped. Owners of the SIMs were given copies of the consent form and survey and were strongly encouraged not to coerce user participation in the survey at any time the survey was available on their property in order to preserve the voluntary nature of the study. The kiosks were placed in an agreed upon location on each SIM, with a total of nine SIM locations and were available for a period of eight months. Because of the electronic and computer-based nature of SL and the survey kiosks, computer "hacking" of the kiosks, which might compromise the information by uncovering the usernames and survey responses of participants, was a concern with the researchers as well as the SIM owners. To ensure participant confidentiality, the security of the kiosks was validated by the kiosk creator as well as tested and approved by the researchers and several of the SIM owners.

Occasionally due to system-wide changes, the kiosks were affected or became "glitchy", so the kiosks were checked weekly and replaced if necessary. As soon as they were recovered from the kiosks, each survey was coded and securely stored. At the end of one

year, the researchers will no longer have any access to the raw data. After three years the raw data must be destroyed by the faculty advisor.

Once placed and secured, kiosks in each educational SIM in SL could be approached voluntarily by any avatar. Once they approached the kiosk, users were presented with an initial electronic prompt, encouraging them to accept a folder of information containing the consent form and study synopsis. Users were assured of the confidentiality of their responses and avatar usernames were not recorded. After reading the consent form, users were prompted to indicate their consent by responding "yes" to the first question of the survey. By indicating that they would like to continue past the consent form to the survey it was assumed that participants were giving their consent to participate. Users who responded "no" were directed away from the study and exited from the kiosk. Survey responses were sent immediately after completion to a secure email database.

Participants who agreed to take the survey were informed via the consent that they could exit the survey at any time, and all questions in the survey offered an "Exit" option which would navigate users away from the survey. Surveys which were unfinished were not included in the data collection process. After completing the survey, participants were again presented with another electronic prompt, thanking them for their participation and "giving" them a folder containing a gift of a free t-shirt for their avatar and instructions for how to contact the researchers for additional information about the study. Users were also informed about the voluntary qualitative interview portion of the survey, and were encouraged to contact the researchers to indicate their interest. Participants who declined to participate in the qualitative portion were not contacted by the researchers at any time after completion of the survey.

Since the interviews were only conducted after persons who took the survey consented by clicking on the last question on the survey, all who were interviewed came from the pool of persons who completed the survey. We had 11 interviews or 11% of the population who completed the survey. Any user interested in participating in the qualitative section contacted researchers via secure email and provided their avatar username and email address. Participants were then emailed the interview questions. Any participant who indicated they were comfortable answering the qualitative questions was considered to have given consent to the interview and was scheduled an avatar-to-avatar meeting in SL. Avatar usernames during the qualitative interviews were coded and were not connected to their survey answers to maintain confidentiality. The thematic analysis was done by a panel of four graduate students who had not been previously involved in the research. Each identified key themes that ran through the 11 interviews for each question. These themes were then compiled by them and presented to the researchers.

Results

Demographic data was compiled and shows the breakdown of respondents as to RL age, ethnicity, gender, education, marital status, and residence (Appendix C). SL data shows the reported number of avatars, avatar age, and avatar gender.

Of the 100 completed survey participants, the largest number were between ages 31-50, followed by the next highest age group up to age 65. Over three quarters of the participants were Caucasian. This participant sample, which was gathered on predominantly educational and health related SIMs, was highly educated with 95% having at least some college and 44% with a terminal graduate degree. More than two thirds came from the USA with the next highest contingent from Europe. In SL gender identification seemed to match identification in RL with most participants being female and a small percentage identified as 'other'. Relationship status in RL revealed that about half of the population surveyed were married; the next largest percentages were single (28%) and divorced (12%). Almost two thirds (62%) of the completed surveys came from the SIM addressing physical and virtual handicaps. An additional 33% came from the educational institutions and the remainder from the hospice and healthcare organizations. Many of these persons may frequent more than one of these SIMs.

In SL there is the freedom to be several identities by way of a number of avatars. A little over one third of participants indicated they had only one avatar, one quarter had two, and about one third had three or more. Of the participants 73% reported that they were using their first avatar to take the survey. Selected and informative associations between variable attributes were discovered when doing crosstabs as reported below. Due to the limited sample size and the non-parametric nature of the data, the data is reported in a descriptive manner below with additional analysis being left to future more robust study. Additional demographic information could be gleaned and organized from a representative sample of avatars in SL surveyed, which would be much more robust than reported here. Such a cross sampling may require extensive placements of kiosks or other methods of inworld survey distribution.

The following reported quantitative data address the research question showing trends in demographics and usage of those within our limited example who completed the survey, why they came to use SL, how they used SL, and to what purpose.

Use of SL

In response to the survey question of why participants first came to use SL,46% said they were curious, followed by 13% meeting people, and 11% for educational purposes. In terms of length of calendar time on SL, almost half (49%) reported 3-6 years, with the next highest number 19% reporting 1-3 years, followed by 15% new persons who were on only under three months. Close to two thirds (61%) reported signing into SL at least once per day with 33% signing in between 2-4 times per day. A full 62% of the participants spent at least 5 hours per week on SL with 17% spending more than 20

hours per week. Of those reporting (a) curiosity or (b) meeting people as their initial reasons for coming to SL, there was a high concentration of spending more than 10 hours per week on SL ([a] 54% and [b] 49% respectively). Over one third of participants (38%) established what they believed to be a close relationship with another avatar on SL. Those committed to a marital or other significant relationship in RL (51%) also tended to be involved in a significant relationship in SL (80%) and to cluster in the 10 or more hours per week (56%) of SL use. Of this group that reported being in a relationship, 24% responded that they were in a relationship longer than nine months, with 14% who reported relationship length as less than nine but more than three months. Of those relationships considered significant by the respondents, 77% were considered intimate.

Frequency of planned interpersonal contacts on SL and RL showed similar percentage rates on the low end of the scale with about one third (31%) of the participants indicating they have less than three planned interpersonal contacts per week in both RL and SL. Of the one third (32%) of participants who stated they have less than three social contacts per week in RL, 100% said they had at least one social contact on SL per day. One quarter (26%) of participants who have one or less RL planned interactions a day indicated they have at least five or more SL interactions.

Purpose of SL

Sixty percent of participants indicate belief that SL avatars represent in part the real person (puppeteer). Of those persons who came onto SL out of curiosity, 61% fell into this category. Of these participants who see the avatar as the representation of the real person, almost three quarters (73%) indicated they could learn more about people because of the anonymity of the avatar. Of the total participants, almost half (46%) engage in or believe all of SL is role play. Eighty-eight percent reported friendships were readily available in SL through such activities as dancing (62%) and role plays (59%), and a variety of groups (100%), among others. Seventy-nine percent reported doing activities that they enjoyed currently or at one time in RL . In terms of what participants sought from the SL experience, 27% were in SL to have fun, 21% to build and create, 14% to meet people, and 12% for educational purposes. Of the three quarters (74%) of this selected subpopulation who indicated they attended SL groups, educational groups at 33% and social groups at 18% were the top two selected. Sixty-five percent of all participants rated themselves as obtaining satisfaction in RL social relationships corresponding to 55% in SL relationships.

Qualitative Analysis

The following reported qualitative interview data address the research question showing more in depth thematic analysis within our limited example of why they came to use SL, how they used SL as a major and necessary social interaction vehicle, and the relationship between RL and SL roles.

Of the 11 self-selected participants who volunteered to be interviewed, 8 came from the SIM addressing physical and virtual handicaps. A more precise sampling method to assure that this group was a representative sample of the larger group who completed the survey was not possible as the survey asked for volunteers and with respect to the participant's privacy considerations did not reach out to specific survey participants. Only those who agreed to be interviewed were contacted. A thematic analysis of qualitative interviews with participants revealed that these particular users' motivations for joining SL were for social support or interpersonal interactions of some kind, which they were not able to experience in RL due to a physical disability or social impairment. Participants interviewed reported their motivations to participate in SL activities were influenced by the amount of time and the types of groups they engaged in, as well as the wide availability of groups in SL which were not available to them in RL due to these social or physical impairments.

These activities included development and attending self-help and other support groups, maintaining a small retail business, attending educational groups, social interaction, art projects, attending cultural activities, exploring new places, meeting new people, personal improvements in appearance and health, and participation in civic causes.

Engaging in role play activities occurs in a variety of forms, including the use of multiple avatars (alts) for diversified purposes. Typically, one avatar is the primary character but the other 'alts' have a particular function in particular settings. The alts are used to preserve the anonymity of the primary avatar. These alts are often used for role plays or for particular roles. Some examples include: gaming, teaching, alternative sexual practices, gender shifts, and alternative sexual identity. In most of the interviews, alts had long standing roles. The role plays were ongoing and had detailed story lines with a wide variety of social networks emerging and morphing within the role play setting.

Most of those interviewed had a significant other in RL but reported their additional relationships in SL did not serve as a threat to these RL relationships. Every person interviewed reported affiliation with at least one community in SL. Communities define themselves in terms of interpersonal interactions, culture, behavior standards, manner of communication, purpose in creating the ambience for a particular lifestyle, production of products to serve the public, and added anonymity to engage in certain practices. Most communities are open to visitors and some are closed.

Participants interviewed predominantly reported that their motivations for joining SL were either interest in social interactions, entertainment, or curiosity. Of those participants interviewed who reported having a disability, most reported that their need for socialization or stimulation was met in SL better than in RL, either due to isolation or physical impairment, and this positively influenced the amount of time spent engaging in SL communities and activities.

Some specific examples include: parties and dances, sports, raising and breeding SL animals, community events, self-help groups, cultural events, art appreciation, philosophic debates, obtaining knowledge on a variety of useful subjects, philanthropic causes, building of all kinds including homes, communities, furniture, clothes, and so on.

The majority of interviewed participants (8 of 11) reported either a lack of RL social interactions due to physical limitation/isolation or a lack of ability to easily engage socially due to a social impairment. They all reported SL as a method of increasing their interpersonal interactions through interest groups, activities, communities, and friendships/relationships. SL was viewed by these participants as a way of increasing their socialization and/or practicing social interactions through the virtual medium. Interviewed participants most frequently identified that they could easily make friends and join interest groups in SL and were more engaged with these social interactions in SL than they were in RL. Time spent in SL was reported as being influenced by their engagement in SL and their lack of socialization in RL.

A smaller subset of the participants interviewed (2 of 11) reported that their participation in SL was a direct result of their activities in RL, which included work both physically and virtually on the educational SIMs. The interviews also supported a variety of options for SL gender representation including the use of asexual identities such as furries, and, on occasion, inanimate objects. However, this particular sample reported clear self-representation of gender between RL and SL gender.

Discussion

Because of the lack of time and staff members to explore and collect data from every or most SL communities, as there are hundreds, the sample size for this project is limited in scope. This is a potential limitation to the research, and for future research it is suggested that there be data collection throughout a wide variety of SL communities or many studies completed in a variety of locations to seek combined trends. This study represents the first step in this endeavor.

This exploratory study design yielded data from both quantitative (survey) and qualitative (interviews) sources. The two together help to put some formative solidity (for this limited sample) on the initial research question posed of why people seek out involvement in SL, what activities they frequent, and what purpose it serves for them. As is the case in many survey studies, much of the data was not clear and therefore qualitative impressions added a great deal to the understanding of the selections made by participants. Putting these two together leads to the following trends in this preliminary study.

The quantitative and qualitative data suggest highly preferred activities in RL were also found to be motivating in a similar way in SL. About half of the respondents either role played or believed SL to be a world of role play. A large number of participants in all the RL relationship commitment categories in the survey reported that they believed they could make friends all or some of the time in SL, indicating that there is some positive feedback in interpersonal interactions or relationships in SL. As described in many of the interviews, such interactions become a RL motivator for RL social interactions and relationships. This ties into the predominant belief from survey results that persons on SL can get to know each other better due to the anonymity of the avatars. Note, however, that interviews came from educational and health sites. Communities with a different purpose and/or culture may yield very different results.

Participant interviews indicate the degree to which SL interactions and activities fulfill needs that are not met in RL has an influence on the amount of time spent in SL. A segment of the respondents showed a limited (under 3 social contacts per week) social interaction in RL. Many of these persons at the same time indicated a much more frequent interaction per week on SL. Making friends in the context of key occupations including role-plays, building and creating, working at businesses, education, groups of all kinds, and exploring arts and music are some of the activities which occupy their time. In this sense, SL can be seen as an extension and representation of activities possible in RL but much more easily represented in SL. The qualitative interviews suggest that individuals who utilize SL to fulfill a need that is not met in RL due to physical impairment or social deficit may do so because of the lack of RL interactive opportunities. This is related to a key theme that dissatisfaction in interpersonal relationships in RL could be a motivator for individuals to join the virtual world for social interactions, communities of friends, or relationships.

This data suggests a strong social influence of RL on certain SL experiences, choices, and behaviors, for example, avatar gender, SL activities, SL interpersonal satisfaction, and SL relationships, as well as evidence that some social influences present in SL affect RL behavior, including the formation of relationships and time spent engaging in virtual interactions. However, as this study is largely exploratory in nature, additional data will need to be collected to determine directionality of influences as well as further relationships between RL and SL.

Implications for Research and Limitations

Recent research has developed a substantial base of understanding about many aspects of online virtual world use, including the cultural differences between SL and RL as well as the use of this technology for purposes such as marketing, anthropological research, and educational uses in online interactions (Bell et al., 2009; Eastwick & Gardner, 2009; McCarty & Clancy, 2002; Smokowski & Hartung, 2003). However, there is a gap in the current research regarding what motivates users to join in the online melee and how the real world and the online world interact with each other. This is mainly in regards to how individuals function in interpersonal communications, as

well as social influences exerted on the individual (Gottschalk, 2010 p. 511; Nesson & Nesson, 2008).

SL provides individuals the opportunity to become someone other than who they are in RL. In essence, they can take on a new identity, leaving their RL identity behind. For many people this is liberating. In collecting data, avatar puppeteers are required to self-report on the questionnaire. There is a question of how truthful their answers are, and which identity (avatar) they are portraying in their answers. Individuals on SL may have multiple avatars, thus allowing the same individual to take the survey multiple times and from several perspectives. In regards to honesty in self-report, this is an ongoing research issue even in RL, which would require many factors to be taken into account. The current survey used asked about the puppeteer and not the avatars. To control for multiple uses, there would need to be some way of the puppeteers identifying themselves, which may risk confidentiality and further taint the data.   In RL as well as SL participants may lie on their answers on a survey. On the other hand, a case could be made because SL is anonymous, individuals may choose to be more honest than they would in RL. Information on this important question may be obtained in additional survey studies gleaning information on how participants respond to SL surveys.

In the current research study, demographics such as age, gender, and ethnicity may have been influenced by the placement of the survey kiosks and the method of collection. Due to the placement of kiosks on educational and health care based SIMs, a bias in the participant age range (30-65 predominantly), gender (60/40 female to male ratio), and ethnicity (77% Caucasian) as well as participant education (largely college, master's and doctoral degrees held) may exist and will need to be accounted for in future research. Therefore, some results, most especially related to reported ethnicity (analyzed with interactions in SL), were not included. The language of the survey (English) may have had an influence on this sample, possibly limiting the ethnicity of the participants taking the survey, so future studies utilizing this method of data collection may consider using a translated survey to acquire a more representative sample of SL participants.

This study did a form of content validity by having knowledgeable users review the survey. Additional studies might use surveys in a more narrowly defined SIM content, such as SIMs dedicated to specific lifestyles of participants. One example might be religious communities. This may allow for a greater potential of content and construct validity in developing the surveys. To allow for greatest flexibility in constructing the questions, a kiosk or other inworld distribution method should not have constraints on the length of questions. Reliability could be explored by administering the survey to SIMs previously used to see if similar results would be gleaned. Reliability could also be explored by retesting a sample of those who took the survey after a period of time has elapsed. However, many life circumstances both in SL and RL would affect the results. Over the course of studies a clear procedure for establishing inter-rater reliability of coding must also be established based upon the agreed upon definitions of emerging

themes. Should inworld data collection be successful in a well-developed stepwise survey delivery as well as validity for particular SL population samples, this opens the doors for further and more pertinent research that is capable of maintaining the integrity of the unique socio-cultural atmosphere of SL and similar virtual worlds. This may become a key strength of the research in this area.

The method of collection revealed a significant influence on survey completion, as another 99 surveys engaged were "timed out" and incomplete, and therefore it was necessary for any data collected in these surveys to be excluded. Once timed out, the data was not forwarded to the database. In these cases it was only known that a survey was started but not completed.

Reasons for this may include the system-wide changes that SL experiences on a continual basis affecting the functionality of the kiosks, or a bias which eliminates users who are unfamiliar with how to use the kiosk and interferes with their ability to take the survey. Future use of the inworld collection method should explore additional technological resources for distributing surveys which are more reliable, more user-friendly, and again possibly multi-lingual.

Further limitations in the use of this particular kiosk included the limit to the number of characters which the kiosk could hold, so the surveys needed to be edited from 42 questions to 37 questions to accommodate the amount of memory space available in the kiosk. A total of 12 surveys taken were missing some data due to these kiosk limitations. It was also important to consider the limitations that exist in data collection in online virtual worlds, including concerns about maintaining participant confidentiality in a venue where computer hacking is somewhat prevalent (Bell et al., 2009, p. 42; McCarty & Clancy, 2002). The survey used also presented limitations as it was designed specifically for use in this study and is not a validated instrument; therefore it must be refined in future research in both form and function.

It was noted, however, that the inworld collection method of survey kiosks was an effective data collection tool in terms of appropriately securing survey information, and the kiosk was utilized consistently by SL participants. Therefore, future research in social services seeking to retain the social environment of SL during data collection should examine further options for exploring the use of SL survey kiosks. For example, placing kiosks on different types of SIMS, placing more kiosks, or refining the technology of the kiosks inworld could yield a more accurate and representative sample of the population within SL.

Also, research in the field of social services must adhere to a code of ethics and remain cognizant of the unique context of online virtual reality use. Further considerations must also be made for the future of research protocols, and the policies and ethical requirements of the Internal Review Board should take into account the quickly advancing technology of online virtual worlds. Given the unique technical potential of

SL, this puts the responsibility on the researcher to take pains to be as ethical as possible when conducting research. Avatars may not be humans, but the person controlling and, more importantly, experiencing the avatar most certainly is, and therefore is susceptible to all of the vulnerabilities of more typical research subjects.

Should inworld data collection be successful, this opens the doors for further and more pertinent research which is capable of maintaining the integrity of the unique socio-cultural atmosphere of SL and similar virtual worlds. This may become a key strength of the research in this area.

Implications for Social Services Practice

Technologically advanced research methods used inworld are improving the quality of the data collected and future advances in data collection can provide a more accurate representation of information (Bell, et. al, 2010) and begin to help human service workers uncover how services offered in SL might be applicable to their RL clients. Research in the field of social services is uniquely designed to examine how individuals and groups interact socially, and can be adapted to aid in the exploration of these interactions in SL and other similar online social venues in the fields of mental health counseling and social work education (Rockinson-Szapkiw & Walker, 2009). In order to advance and bridge barriers to human services practice through the utilization of modern technology, there must first be an understanding of the nature of online worlds such as SL, the influences and relationships therein, and the potential for SL as a tool for social service interventions in the future.

With the information gleaned from this exploratory study, research in the field of social services can further expand on relevant knowledge about virtual worlds. From there we can begin to explore and predict what role human services practice has in the virtual realm, and whether it could be executed as an effective form of intervention and service delivery. For example, many young adults struggle to come to terms with their sexuality in a society where homosexuality and transgender assimilation is viewed with derision and condemnation. Their RL experiences might prompt them to join SL where using a "gender-swapped" avatar is completely appropriate and accepted. In turn these young adults can interact with other individuals with similar experiences and interests. This begs the question: Could the inception of an inworld support group directed by a social service worker be beneficial in creating a positive experience for this vulnerable population?

Results from the qualitative analysis provided some insight into the motivation for engaging in social relationships and activities in SL and the sense of community felt by many SL users. With many interviewees reporting that they were limited in RL by physical disabilities or social impairments/isolation, SL may provide a unique opportunity for them to reduce their level of isolation and improve their social supports and resources. As social isolation is a common condition for those in RL with mental health and physical health disorders, the community atmosphere available in SL could

be a resource offered by social service workers to help their clients access therapeutic resources or even re-engage with much needed leisure activities and interests that may be lacking in their real lives. Professional human service workers could assist individuals with disabilities or their homebound caregivers by connecting them to social interactions and social support networks within SL without taxing them physically (Heron, Gentle, personal communication, April 29, 2011). This could reduce the impact of their disability or the disability of a loved one on their overall well-being.

Other groups that meet in SL, and even those individuals who have not yet discovered this online resource, could benefit from similar support systems. This includes individuals without transportation to an agency or facility, individuals with disabilities, individuals seeking a cultural experience, or those whose social interaction is limited due to personal illness or caregiver responsibilities. Using online virtual communication, human service workers could redefine service delivery by reaching a larger population of individuals and more diverse groups, and clients can access a broad network of social and educational support tools.

Social service workers may be able to use this tool to advance and broaden their scope of practice, bringing technology and education together. For instance, use of SL for practice courses in social work interventions enable educators the ability to utilize Web 2.0 technology, including the synchronous voice-chat and visual environment to target the Council on Social Work Education (CSWE) Educational Policy and Accreditation Standards (EPAS), such as professional identity and diversity, through experiential activities and role-play (Vernon, et. al, 2009). Interactions with both SL users as well as the educational communities within SL revealed just how diverse the cultural aspects and educational opportunities are in this virtual world.

In addition, special consideration must be made for ethical demands of practice, including issues of safety, prevention, and mandatory reporting. Questions, such as what a social service worker is responsible for if a client or group member expresses suicidal ideation while communicating via SL interactions and how to ensure that the client being treated is the client behind the avatar, must be given the utmost consideration before beginning this potential venture. These questions are likely to produce opinions and concerns across the spectrum of professional human services and will need to be defined ethically as well as legally.

Conclusions

This study represents the emerging use of virtual reality technology in the study of why a select sample of persons sought SL, what activities appealed to them, and what benefits were derived for them. The study was completed within the context of a graduate social work research course and applies an extended application of distance education to human behavior in a social environment. Data results indicate that

interests of the individual in SL may to some degree reflect the interests they enjoy or once enjoyed in RL (due to a disability, for instance), making SL an opportunity for them to re-experience interests or accomplishments. Understanding this, SL has the potential to provide role plays for clients to enhance their RL social groups, communities, activities, and experiences. The methods utilized in this study can be directly applied to numerous research endeavors in using immersion in virtual worlds, such as the application of the social network knowledge construction (Dawley, 2009) within social service educational curriculum design.

References

Anderson, T., & Dron, J. (2011). Three generations of distance education pedagogy. *The International Review of Research in Open and Distance Learning, 12*(3), 80-97. Retrieved from www.irodl.org/index.php/irrodl/article/download/890/1826.

Anstadt, S., Burnette, A., & Bradley, S. (2011). Towards a research agenda for social work practice in virtual worlds. *Advances in Social Work, 12*(*2*), 289-300.

Anstadt, S., Burnette, A., & Bradley, S. (2012). Advanced technology education: A case for uses of virtual reality in teaching human services. *Journal of Virtual Studies,* 3(1), 264-273.

Aurilio, S. (2010). *Learning in the wild of a virtual world* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (Accession Order No. [3399141]).

Baker, S., Wentz, R. K. & Woods, M. M. (2009). Using virtual worlds in education: Second Life® as an educational tool. *Teaching of Psychology*, *36*(1), 59-64. doi: 10.1080/00986280802529079

Barab, S., Thomas, M., Dodge, T., Carteaux, R., & Tuzun, H. (2005). Making learning fun: Quest Atlantis, a game without guns. *Educational Technology Research & Development, 53*(1), 86-107.

Belisle, J. F., & Bodur, H. O. (2010). Avatars as information: Perception of consumers based on their avatars in virtual worlds. *Psychology and Marketing, 27*(8), 741-765. doi: 10.1002/mar.20354

Beltran, L. M., Sierra, R. S., Gutierrez, C. & Garzon-Castro, L. (2012). Second Life as a support element for learning electronic related subjects: A real case. *Computers and Education, 58*(1), 291-302. doi : http://dx.doi.org/10.1016/j.compedu.2011.07.019.

Bell, M. W., Castranova, E., & Wagner, G. G. (2009). Surveying the virtual world: A large scale survey in SL using the Virtual Data Collection Interface (VCMI). *Data Documentation, 44*, 1-61.

Boellstorff, T., Nardi, B., Pearce, P. & Taylor, T.L. (2012). *Ethnography and virtual worlds: A handbook of method.* Princeton: Princeton University Press.

Boellstorff, T. (2008). *Coming of age in Second Life : An anthropologist explores the virtual human.* Princeton: Princeton University Press.

Brooks, M. (2002). *Drawing to learn* (Unpublished doctoral thesis). University of
Alberta, Edmonton, AB, Canada.

Bruckman, A. *(1997). MOOSE Crossing: Construction, community, and learning in a
networked virtual world for kids* (Unpublished PhD). MIT.

Burger, P. L., & Luckmann, T. (1966). *The social construct of reality: A treatise in the
sociology of knowledge.* Garden City, NY : Anchor Press.

Conners, K. A. (2009). *A second life by design: Exploration of learning theory*
(Unpublished master's thesis). Hamline University, Saint Paul, Minnesota.
Retrieved
from www.hamline.edu/WorkArea/DownloadAsset.aspx?id=2147491167

Damianakis, T., Climans, R., & Marziali, E. (2008). Social workers' experiences of
virtual psychotherapeutic caregivers groups for Alzheimers', Parkinson's,
stroke, frontotemporal dementia, and traumatic brain injury. *Social Work with
Groups, 31*(2), 99-115.

Dawley, L. (2009). Social network knowledge construction: Emerging virtual world
pedagogy. *On The Horizon, 17*(2), 109-121. doi :
10.1108/10748120910910965494.

Delucia, A., Francese, R., Passero, I., & Tortora, G. (2009). Development and evaluation
of a virtual campus on Second Life: The case of Second DMI. *Computers &
Education, 52*(1), 220-233.

Dillenbourg, P., Schneider,D., & Synteta,V.(2002). Virtual learning environments.
*Proceedings of the 3rd congress on information and communication
technologies in education* (pp. 3-18). Rhodes : Greece : Kastaniotis Editions.

Eastwick, P. W., & Gardner, W. L. (2009). Is it a game*?* Evidence for social influence in
the virtual world. *Social Influence, 4*(1), 18-32. doi:
10.1080/15534510802254087

Edwards, M.T. (2012). Tranformative learning theory as a framework for designing
experiences in virtual worlds as appropriate to counsellor education. Retrieved
from www.inter-disciplinary.net/wp-
content/uploads/2012/02/edwardsepaper.pdf

Erlandson, B. E., Nelson, B. C., & Wilhelmina, C. S. (2010). Collaboration modality,
cognitive load, and science inquiry learning in virtual inquiry environments.
Educational Technology Research & Development, 58(6), 693-710.

Fetscherin, M., & Lattemann, C. (2008). User acceptance of virtual worlds. *Journal of Electronic Commerce Research, 9*(3), 231-242.

Gottschalk, S. (2010). The presentation of avatars in Second Life: Self and interaction in social virtual spaces. *Symbolic Interaction, 33*(4), 501-525. doi: 10.1525/si.2010.33.4.501

Holloway, S., Black, P., Hoffman, K., & Pierce, D. (n.d.). Some considerations of the import of the 2008 EPAS for curriculum design. Council on Social Work Education. Retrieved from http://www.cswe.org/Accreditation/EPASImplementation.aspx

Huang, H.M. (2012). Toward constructivism for adult learners in online learning environments. *British Journal of Educational Technology, 33*(1), 27-37.

Isabella, S. (2007). Ethnography of online role-playing games: The role of virtual and real contest in the construction of the field. *Forum: Qualitative Social Research, 8*(3), 1-16.

Jarmon, L., Traphagan, T., Mayrath, M., & Trivedi, A. (2009). Virtual world teaching, experiential learning, and assessment: An interdisciplinary communication course in Second Life. *Computers & Education, 53*(1), 169-182. doi:10.1016/j.compedu.2009.01.010

Jha, A. K. (2012). Epistomological and pedagogical concerns of constructionism: Relating to the educational practices. *Creative Education, 3*(2), 171-178. doi: 10.4236/ce.2012.32027.

Leonard, L., Withers, L. A., & Sherblom, J. C. (2011). Collaborating virtually: Using "second life" to teach collaboration. *Communication Teacher, 25*(1), 42-47.

McCarty, D., & Clancy, C. (2002). Telehealth: Implications for social work practice. *Social Work, 47*(2), 153-161.

Mills, H. (2012). *Avatar creation: The social construction of "beauty" in second life* (Unpublished master's thesis). The University of Akron, Akron, Ohio.

Minocha, S., & Roberts, D. (2008). Laying the groundwork for solialisation and knowledge construction within 3D virtual worlds. *ALT-J, Research in Learning Technology, 16*(3), 181-196. doi: 10.1080/09687760802526699.

Mutekwe, E., Ndofirepi, A., Maphosa, C., Wadesango, N., & Machingambi, S. (2013). A swot analysis of the rise and pedagogical implications of the social constructivist epistemology in educational practice. *Anthrpologist, 15*(1), 53-65.

Nesson, R., & Nesson, C. (2008). The case for education in virtual worlds. *Sage Publications, 11*(3), 273-284. doi: 10.1177/1206331208319149

Newman, T., Olle, M., & Bradley, C. (2012). Social interaction as a contributor to significant learning outcomes in online instruction. *International Journal of Instructional Technology and Distance Learning, 9*(5), 59-64.

Parti, K. (2008). Deviances in the virtual reality or the character-altering power of virtual communities. *European Journal of Crime, Criminal Law & Criminal Justice, 16*(3), 325-343. doi:10.1163/157181708X33337

Pinkett, R. D. (2000). *Constructionist learning in communities* (Written component of Ph.D. general examination). Massachusetts Institute of Technology, Cambridge, Massachusetts.

Riedl, R. E., Tashner, J. H., & Bronack, S. C. (2003). A virtual world initiative: Assumptions about teaching and learning. *International Conference on New Educational Environments.* Lucerne, Switzerland.

Rockinson-Szapkiw, A. J., & Walker, V. L. (2009). Web 2.0 technologies: Facilitating interaction in an online human services counseling skills course. *Journal of Technology in Human Services, 27*, 175-193. doi: 10.1080/15228830903093031

Salmon, G., Nie, M., & Edirisingha, P. (2010). Developing a five-stage model of learning in *second life. Educational Research, Special Issue: Virtual Worlds and Education, 52*(2), 169-182. doi:10.1080/00131881.2010.482744

Shaw, A.C. (1995). *Social construction and the inner city: Designing environments for social development and urban renewal* (Unpublished doctoral dissertation). MIT Media Laboratory, Cambridge, Massachusetts.

Smokowski, P. R., & Hartung, K. (2003). Computer simulation and virtual reality: enhancing the practice of school social work. *Journal of Technology in Human Services, 21*(1/2), 5-30.

Squire, K. & Jenkins, H. (2004). Harnessing the power of games in education. *Insight, 3*(1), 5-33.

Stalker, G.J. (2007). Measuring diversity in daily social contact: The contribution of social context, work and leisure on the opportunity for engagement. *Springer Science+Buisness Media, 86*, 275-295. doi: 10.1007/s11205-007-9115-5

SparkNotes Editors (2006). Sparknote on identity and reality. Retrieved
from http://www.sparknotes.com/sociology/identity-and-reality/section1.rhtml

Sun, Y. (2012). Analysis and research on distance learning in second life. *IPCSIT, 53.*
doi: 10.7763/IPCSIT.2012.V53.No.2.22.

Tsan, J. Y., & Day, S. X. (2007). Personality and gender as predictors of online
counseling use. *Journal of Technology in Human Services, 25*(3), 39-55.

Vernon, R. , Lewis, L., & Lynch, D. (2009). Virtual worlds and social work education:
Potentials for "Second Life." *Advances in Social Work, 10*(2), 176-192.

Vygotsky, L.S., (1978). *Mind in society.* Cambridge, MA: Harvard University Press.

Wood, D. (2009). Real life access to "Second Life " worlds: The potential, the problems
and the possibilities for a barrier-free future. *The International Journal of
Diversity in Organizations, Communities, and Nations, 8*(6), 139-148.

Appendix A

SL Questionnaire

Directions: Please indicate any questions for which you feel uncomfortable in responding in a truthful manner.

1. Did you read the CONSENT FORM located on the screen in front of this kiosk?
a) Yes
b) No

2. If no, reading the consent is an important part of participating in this study. Please click "Exit Survey" and read the consent form before taking this survey.
a) Exit Survey

3. Do you agree to continue past this point and take the following survey?
a) Yes
b) No
c) Exit Survey

Demographics:

4. What is your RL age?

a) Age 18-30
b) Age 30-50
c) Age 50-65
d) Age 65+
e) No response
f) Exit Survey

5 .What is your ethnic background? _____

6. Gender
   a. Male
   b. Female
   c. Other
   d. No response
   e. Exit Survey
7. What is your highest education level?
   a. Some high school
   b. High school graduate

    c.   Some college

    d.   College graduate

    e.   Associate's Degree

    f.   Technical Degree

    g.   Master's Degree

    h.   Doctoral degree

    i.   No response

    j.   Exit Survey

8. Marital status?

    a.   Single

    b.   Divorced

    c.   Widowed

    d.   Engaged

    e.   Married (1-5yrs)

    f.   Married (5-15 yrs)

    g.   Married (15- beyond)

    h.   No response

    i.   Exit Survey

9. What country are you currently living in _____?

10. How did you first hear about SL _____?

11. What motivated you to join SL ? _____?

12. How long have you been on SL _____?

13. Is this your first Avatar in SL ?

    a) Yes

    b) No

    c) exit survey

14. How many Avatars (Alts) do currently you have in SL ?

    a)   1

    b)   2

    c)   3

    d)   4

    e)   5

    f)   6

    g)   7

    h)   More than 7

    i)   No response

    j)   Exit Survey

15. Gender of Avatar(s)?

    a) Male

    b) Female

    c) Other

    d) No response

    e) Exit Survey

16. How frequently do you sign into SL ?

    a. Less than three times per week

    b. 1 time per day

    c. 2-4 times per day

    d. 5-7 times per day

    e. more than 7 interactions per day or stay signed on

    f. No response

    g. Exit Survey

17. How many hours are you in SL ?

    a. Less than one hour per week

    b. 1-4 hours per week

    c. 5-9 hours per week

    d. 10-20 hours per week

    e. More than 20 hours per week

    f. No response

    g. Exit Survey

SL Experience:

18. Which of these choices do you consider to be most prominent for you in SL?:

    a. Social Networking

    b. An extension of RL

    c. Gaming

    d. Creating/Displaying

    e. Revenue

    f. A combination of the above

    g. No response

    h. Exit Survey

19. Did you find SL difficult to navigate?

    a. Yes

    b. No

    c. Exit survey

20. When you meet people in SL do you believe:

    a. The avatar represents the real person.

  b. There is a low likelihood the avatar represents the real person.

  c. The avatar is a contact to further my goals.

  d. I do not relate to other Avatars

  e. Exit Survey

21. Do you believe:

  a. It is impossible to believe anything said online.

  b. You can learn more about people behind the anonymity of the virtual.

  ~~c.~~ For the reasons I am in SL , truth expression about RL doesn't matter

  d. Other

  e. Exit Survey

22. Do you feel you could make valuable, trustworthy friends in a virtual world?

  a. Yes, absolutely!

  b. Yes, sometimes

  c. I'm not in SL to make personal connections

  d. Strictly for role-play/fantasy/gaming

  e. No comment at this time

  f. Exit Survey

23. Have you been dancing in SL ? Do you find it:

  a. Yes, no further comment.

  b. Yes, a good way to meet people and fun.

  c. Yes, stimulating when the avatars are all synchronized.

  d. Yes, better than avatars just standing around.

  e. No, I'm here for other reasons.

  f. No comment or opinion at this time.

  g. Exit Survey

24. Have you done any role-playing (fantasy, space historical, Gorean, BDSM, etc) in SL ?

  a. Yes, no further comment.

  b. Yes, all of SL is role play.

  c. No, not interested.

  d. No, I'm here for other reasons.

  e. No comment.

  f. Exit Survey

SL and RL Interaction:

25. Are you in an intimate/romantic relationship in SL ?

  a) Yes

  b) No

  c) Exit survey

26. How long have you been in this relationship? Please indicate how long?

a) Less than six months

b) More than six months

27. Are any of your close friends or family regularly active on SL ?

a) Yes

b) No

c) Exit survey

28. How many socially interactive everyday contacts do you make in RL ?

a) less than 3 times per week

b) 1 interaction per day

c)   2-4 interactions per day

d) 5-7 interactions per day

e) more than 7 interactions per day

f) No response

g) Exit Survey

29. How many interpersonal social events do you average per day, with people close to you (i.e. close friends, family, lovers, etc.)

a.   1 interaction per day

b.   2-4 interactions per day

c.   5-7 interactions per day

d.   More than 7 interactions per day

e.   No response

f.   Exit Survey

30. Do you get personal satisfaction from interacting with people in RL ?

Not at all   1   2   3   4   5   6   7   All the time

31. What motivates you to attend group or community meetings in SL ?

a.   Friends

b.   Education

c.   Business

d.   Social Support

e.   Other

f.   No response

g.   Exit Survey

32. How many planned, interpersonal social contacts do you have in SL per day?

a.   Less than 3 per week

b.   1 per day

c.   2-4 per day

d.   5-7 per day

e.   7 or more per day

  f. No response

  g. Exit Survey

33. Do you get personal satisfaction from interacting with others in SL ? Please select an answer from 0 to 7 where 0 is Not at All and 7 is All the Time.

Not at all 1 2 3 4 5 6 7 All the time.

34. Pick one activity in SL that you find to be the most motivating (meaning you want to do it again) and list it here_____.

35. Do you find the activity in the previous question motivating in a similar way in RL ?

  a. Yes

  b. No

  c. Partially

  d. Exit survey

36. Have you ever met a person in RL that you first met in SL ?

  a. Yes

  b. No

  c. Planning to

  d. Exit survey

37. Was the meeting a positive experience?

  a. Yes

  b. No

  c. Neutral

  d. Exit survey

38. Would you like to help us further by agreeing to meet with one of the researchers for a brief 6 question interview at your convenience?

  a) Yes

  b) No

 If yes, Thank you! You will be given a notecard with your gift of a free tee at the end of this survey. Please open the box and enjoy your gift. Info will be provided if you change your mind about the interview, but you will not be contacted further.

If no, Thank you! You will be given a notecard with your gift of a free tee at the end of this survey. Please open the box and enjoy your gift. Info will be provided if you change your mind about the interview, but you won't be contacted.

All done! Thank you for participating in the survey! Please accept our gift of a free graphic tee! If you have any questions please feel free to contact the researchers (see notecard attached to your tee) for additional information.

Appendix B

Qualitative Interview Consent and Questions

By answering the questions and e-mailing the researchers to schedule to meet in SL you are consenting to the interview portion of this study. Know that your answers to the above questions will be kept in confidence in the same way that your survey will be. The below questions will be the only questions asked during the interview, and we may only ask "Would you like to share any more information about that?" but only about the topics in the questions below. These questions and your survey will be kept separate and there will be no identifying information connected with your answers. Your username and/or e-mail will be coded in that it will be given a number meaning that your answers in no way can be identified to you. The answers to these questions will be saved on a password protected USB in a locked office and in a locked drawer, accessible only to the faculty advisor and the researchers, and the information will be destroyed after 3 yrs.

Thank you for your time and consideration!

Interview Questions: SL

1. How did you hear about SL ? Please explain?
2. What made you want to join SL ? Once you did, was it easy to navigate and why?
3. What is your favorite thing to do in SL ? Why?
4. What do you perceive that you get out of being a member of SL ? Please explain?
5. Do you feel like you connect with individuals on SL ? Do you connect with individuals in RL ? (e.g. Friends, romantic relationships, groups)
6. If applicable list any groups you belong to in SL and/or RL ? Why did you join?

These next few questions are optional:

7. Do you feel that your avatar is an accurate representation of your RL physical appearance? Please explain?
8. If you have multiple avatars, what is the purpose in having multiple? Please explain?
9. Do you feel that your time on SL fulfills needs that may not be met in RL ? Please explain?

Appendix C

Table 1

Real Life and Second Life Demographics (N = 100)

Dimension	Attributes	Frequency	Percentage
Age in RL	18-30	18	18.4
	31-50	43	43.9
	51-65	29	29.6
	Above 65	8	8.2
	No Response	2	2.0
Ethnicity	Caucasian	77	78.6
	African American	1	1.0
	Pacific Island	5	5.1
	Hispanic	3	3.1
	Other European	10	10.2
	Other	2	2.0
	No Response	2	2.0
Gender in RL	Male	38	38.0
	Female	59	59.0
	Other	3	3.0
Marital status in RL	Single	28	28.0
	Married 1-5 years	13	13.0
	Married 5-15 years	10	10.0
	Married over 15 years	29	29.0
	Divorce	12	12.0
	Widowed	3	3.0
	Engaged	3	3.0
	Other	2	2.0
Education	Some high school	1	1.0
	High school grad.	2	2.0
	Some college	21	21.2
	College graduate	23	23.2
	Associates degree	7	7.1
	Technical degree	1	1.0
	Masters degree	31	31.3
	Doctorate	13	13.1
	No response	1	1.0

Country of residence	USA	70	71.4
	Europe	17	17.3
	Australia	3	3.1
	S. America	2	2.0
	Canada	6	6.1
	No response	2	2.0
Number of avatars	1	37	37.0
	2	26	26.0
	3	15	15.0
	4 or more	15	15.0
Avatar gender	Male	37	37.0
	Female	59	59.0
	Other	04	4.0
Avatar age	Less than 3 months	15	15.0
	3 months- 12 months	09	9.0
	1-2 years	19	19.0
	3-6 years	49	49.0
	More than 6 years	07	7.0
	No response	01	1.0

Athabasca University

The Influence of E-Learning on Individual and Collective Empowerment in the Public Sector: An Empirical Study of Korean Government Employees

Mann Hyung Hur[1] and **Yeonwook Im[2]**
[1]Chung-Ang University, Korea, Republic of, [2]Hanyang Cyber University, Korea, Republic of

Abstract

Our study explores the influence of e-learning on individual and collective empowerment by using data collected from e-learning class participants of Korea's Cyber-Education Center. For the survey, a questionnaire was sent to each of the 41 central ministries' education and training officers (ETO) via email. The ETOs distributed the questionnaire to individuals in their ministries who have taken e-learning classes offered by the Cyber-Education Center during the first half of 2012. Out of more than 1,000 e-learning class attendees, 161 responded to the questionnaire survey.

A set of multiple regression models was employed to explore significant predictors of government employees' individual and collective empowerment in e-learning environments. Using existing literature on empowerment theories, a set of 16 questions was developed. A factor analysis was conducted to condense 16 individual variables into several large categories. Four factors including meaning, competence, self-determination, and collective empowerment were extracted from the 16 questions. The first three equations stood for individual empowerment and the last one for collective empowerment. Each of the four factors was utilized as a dependent variable in the multiple regression analysis.

Each regression model uncovered its own set of variables that played a role in empowerment. The predictor variables of the meaning dimension were more widely split than those of the competence dimension or the self-determination dimension and

The Influence of E-Learning on Individual and Collective Empowerment in the Public Sector : An Empirical Study of Korean Government Employees

Hur and Im

collective empowerment. Only one independent variable—preference of e-learning class to offline class—was associated with all four dependent variables. However, modalities of e-learning activity, which were expected to be a significant predictor of empowerment, were not associated with any of the four dependent variables. In addition, lecture types of the e-learning class were also expected to be a significant predictor of empowerment but were only associated with the competence dimension.

Keywords: Individual empowerment; collective empowerment; e-learning; online discussion; government employment; self-determination

Introduction

E-learning stands for a form of electronically designed, distributed, and facilitated learning activities. It includes instruction delivered via all electronic media, such as the Internet, intranet, satellite broadcasts, audio/video tape, interactive TV, and CD-ROM (Govindasamy, 2002). E-learning can be conceptualized in five dimensions: a new tool that incorporates equipment, hardware, and software; a facilitator of interaction; learning; a reduction in distance; and a collaborative enterprise (Stein et al., 2011). Unlike traditional in-class learning, e-learning is most likely to reference out-of-classroom educational experiences, although in-class educational activities experienced via information and communications technology (ICT) can sometimes be described as a form of e-learning. In addition, e-learning includes blended learning known as a mixed type of learning via the online and offline learning environments. This unique device of learning has been recognized as an intervention that can facilitate organizational learning (Phang et al., 2008) and individual empowerment (Gandhi, 2011) in the public sector.

E-learning offers unprecedented opportunities for learners. Its primary advantage is that it enables students to participate in learning activities from anywhere in the world and at any time provided a computer and internet connection are available. Nowadays, devices such as smart-phones or smart-pads provide even mobile learning opportunities. Many countries have developed national e-learning policies and e-learning infrastructure designed to give direction and lead the way (Anderson et al., 2006; Brown et al., 2007; Stein et al., 2011). In Korea, the Central Officials Training Institute (COTI) opened the Cyber-Education Center in 2009 to provide virtual classes for government employees. Since e-learning is quite flexible in terms of space and time, government employees can even take on-the-job training without leaving their offices. Each year, thousands of government employees enroll in e-learning courses via the Cyber-Education Center.

In the government sector, the trained incapacity is recognized as a long-standing problem. Government employees work in a bureaucratic environment and are accustomed to following their supervisors' directions or prepared manuals; therefore,

The Influence of E-Learning on Individual and Collective Empowerment in the Public Sector : An Empirical Study of Korean Government Employees

Hur and Im

they tend to gradually lose their creative thinking abilities (Adler, 2012; Turner, 1976). Government employees in Korea are usually recognized as well-qualified individuals before they start working for the government because they have to pass a highly competitive exam. However, they subsequently appear incapable of doing anything much with their academic backgrounds and potential, which might lower the feeling of achievement associated with their work and the level of citizen satisfaction.

Empowerment in an organization corresponds to employees' ability to recognize their timidity, create autonomy through boundaries, and build teams for problem resolutions (Terblanche, 2003). A variety of pedagogical designs, content types, and lecture types for optimizing e-learning have been developed and are available. Based on these devices, e-learning can offer vivid and authentic learning materials using multimedia technology. However, these e-learning devices have rarely been examined to determine how effectively they can contribute to the improvement of knowledge transfer, knowledge enrichment, and empowerment. Although e-learning has been implemented in the educational and training field for government employees, so far little evaluation on its effectiveness has been conducted. Our study explores the influence of e-learning on individual and collective empowerment by using data collected from e-learning class participants of COTI's Cyber-Education Center.

Literature Review

E-Learning

Definition.

Researchers and practitioners have yet to agree on a common definition for e-learning. The term e-learning is frequently confused with other learning modes, such as distance learning, open learning, and open and distance learning (ODL), although they are not interchangeable based on their meanings (Moore, Dickson-Deane, & Gaylen, 2011). E-learning literally refers to the learning activities based on an electronic delivery means, whereas distance learning refers to an instructional delivery mode in which an instructor is physically located in a different place from the learner as well as possibly providing the instruction at disparate times (Moore, Dickson-Deane, & Gaylen, 2011, p. 129). Open learning means "either that distance education is the prevailing method used by the teaching system or that there are no prerequisites for access, even for degree programs" (Trindade, Carmo, & Bidarra, 2000, p. 2).

E-learning, in a narrow sense, is defined as strictly being accessible using technological tools that are computer-based, web-based, web-distributed, or web-capable (Nichols, 2003) and considered part of ODL. However, e-learning, in a broad sense, not only covers content and instructional methods delivered via CD-ROM, the Internet, or an

The Influence of E-Learning on Individual and Collective Empowerment in the Public Sector : An Empirical Study of Korean Government Employees

Hur and Im

intranet (Benson et al., 2002; Clark, 2002) but also includes audio- and videotape, satellite broadcasts, interactive TV, and mobile devices. In this sense, it is used as a synonym of ODL that diverges from distance learning (van Zyl, Els, & Blignaut, 2013). In our study, e-learning refers to a type of learning that is synonymous with ODL.

Characteristics.

E-learning, in terms of being synonymous with ODL, is understood from many perspectives and used with different meanings (Stein et al., 2011). Its applications and processes include computer-based learning, web-based learning, virtual education opportunities, and digital collaboration. Content is delivered via the Internet, intranet/extranet, audio or video tape, satellite TV, CD-ROM, or mobile devices. It can be self-paced or instructor-led and includes media in the form of text, images, animations, and streamed video and audio.

Four general categories can be identified in e-learning: 1) technology-driven, 2) delivery system-oriented, 3) communication-oriented, and 4) educational paradigm-oriented (Sangrà et al., 2012). From the perspective of the technology-driven category, e-learning is the use of ICT for learning. It is an ICT-based learning setting of taking a course online using a modem, wireless, or cable connection to access course material from a computer, phone, or handheld device. From the perspective of the delivery system-oriented category, e-learning is the delivery of a learning, training, or education program by electronic instruments (Li et al., 2009). The communication-oriented category considers e-learning to be a communication, interaction, and collaboration tool in an ICT-based environment. Finally, the educational paradigm-oriented category considers e-learning as a new way of learning or as an improvement of an existing educational paradigm by using ICT (Sangrà et al., 2012). E-learning is oriented toward the construction of a user-friendly learning setting by using ICT. Through e-learning, students can access e-learning content wherever and whenever they like. They can also repeat the entire learning process as the courses are recorded and stored, and repeated access to content is usually allowed (Im & Bautista, 2009). All four categories have to focus on the achievement of learning excellence.

Modalities of e-learning activity.

Modalities of e-learning activity refer to the types of e-learners' activities. In a broad sense, they can be divided into two categories: individualized self-paced e-learning and group-based e-learning. Individualized self-paced e-learning refers to the situation where a learner is, by himself or herself, accessing learning resources such as a database and course content. This category can be further divided into open and closed individualized self-paced e-learning. The former involves accessing learning resources via an intranet or the Internet, whereas a learner in the latter type uses learning resources such as a database or a computer-assisted package offline while not connected to an intranet or the Internet.

The Influence of E-Learning on Individual and Collective Empowerment in the Public Sector : An Empirical Study of Korean Government Employees

Hur and Im

Group-based e-learning refers to the situation where groups of learners are working together in an ICT-based setting. This category can also be further divided into two types: synchronous and asynchronous group-based e-learning. Learners in the former type are usually working together in real time via an intranet or the Internet whereas those in the latter type are working over an intranet or the Internet and exchanges among participants occur with a time delay. A critical difference exists between individualized self-paced e-learning and group-based e-learning: Interactions in e-learning are very limited in the former regardless of being online or offline, but widely open in the latter regardless of being synchronous or asynchronous. Collaboration is usually realized through tasks and discussions. The depth of collaboration is perceived to vary, depending on assignment type and learner motivation (Leppisaari et al., 2013).

E-learning activities are closely related to content delivery style. Lectures in the e-learning setting can be delivered in a very interactive way. Lecture types in the e-learning setting can actually be more diversified than those in traditional offline classes. To promote visual attention, both static and moving images can be presented at the same time. Educational games can also be utilized in an interactive way. A learner physically and/or mentally has a role in creating an outcome in games. His decision, in return, results in a reward or consequence. In such ways, e-learning can provide more diversified lecture types for learners so that learning excellence can be effectively achieved.

E-learning objectives.

Learning excellence, summarized as effective knowledge transfer, is one objective of e-learning. Knowledge transfer remains one of the most important goals in learning. In the context of ICT and incorporated learning, e-learning is a key enabler to knowledge transfer (Owens & Price, 2010). The meaning of learning excellence has changed since the emergence of the concepts of heutagogy and andragogy with Web 2.0 (Blaschke, 2012) to include empowerment (Halawi et al., 2009).

According to heutagogy originally rooted in andragogy, as the development of e-learning is successfully achieved, e-learning participants gradually move from passive to self-directed learners and then on to self-determined learners; at the same time, the self-determined learners progress in maturity and autonomy. More mature learners require less instructor control and course instruction and can be more self-directed and self-determined in their learning (Blaschke, 2012, p. 60); at the same time, they acquire both competencies and capabilities. "Competency can be understood as proven ability in acquiring knowledge and skills, while capability is characterized by learner confidence in his or her competency" (Blaschke, 2012, p. 59). The two concepts are also usually cited as the key elements of empowerment (Thomas & Velthouse, 1990). However, in the field of e-learning, the relationship between e-learning and empowerment has rarely been explored. In the e-learning literature, empowerment and its components as well as developmental processes have rarely been investigated, although significant materials

The Influence of E-Learning on Individual and Collective Empowerment in the Public Sector : An Empirical Study of Korean Government Employees

Hur and Im

exist in the psychology, education, and social work and social welfare research fields.

Empowerment

Empowerment is conceived as a multidimensional social learning process that helps people gain control over their lives (Page & Czuba, 1999). Empowerment is operative at various levels—namely, individual, interpersonal, organizational, community, and collective (Hur, 2006). Boehm and Staples (2004) emphasized personal and collective dimensions whereas Dodd and Gutierrez (1990), Lee (1994), and Gutierrez (1990) examined personal, interpersonal, and institutional or political dimensions. However, the interpersonal dimension can be included in the collective dimension because the term *interpersonal* has a connotation of collectiveness. The institutional or political dimensions can be represented as part of the collective dimension. Therefore, empowerment can be examined in the context of both individual and collective aspects (Hur, 2006).

Individual empowerment and its dimensions.

Individual empowerment relates to the way in which people think about themselves as well as the knowledge, capacities, skills, and mastery they actually possess (Staples, 1990, p. 32). Various authors have presented the dimensions of individual empowerment in their own way, but the components might be expressed along with the array of Thomas and Velthouse (1999) and Spreitzer et al. (1997). Four dimensions can be extracted from the review of various literature—namely, a sense of meaning, competence, self-determination, and impact (Hur, 2006).

A sense of meaning refers to the notions of consciousness rising (Moreau, 1990) and critical consciousness (Lee, 1994). In a conceptual view, a sense of meaning can become a greenhouse in which the concept of competence is generated (Thomas & Velthouse, 1990). Competence refers to an individual's ability to perform a job properly. Self-determination is considered to be one of the most critical factors in the components of individual empowerment. It refers to a state of understanding in terms of what to do in a crisis situation or in the resolution of particular problems. The notion of impact falls between individual empowerment and collective empowerment because impact is outcome-oriented toward organizations and society as a whole.

Collective empowerment and its dimensions.

Collective empowerment refers to a process by which individuals join together, help one another, learn together, and develop skills for collective action (Boehm & Staples, 2004; Fetterson, 2002). Individual empowerment sometimes conflicts with the development of collective empowerment, when empowerment is not effectively operating. Although individuals can become more empowered personally through the process of personal development, they cannot always be effective in helping to build their group's collective empowerment. Personal empowerment should be consistent with collective

The Influence of E-Learning on Individual and Collective Empowerment in the Public Sector : An Empirical Study of Korean Government Employees

Hur and Im

empowerment to improve the value of social and economic justice more effectively (Staples, 1999).

Collective empowerment develops when people join in action together to resolve particular social problems and achieve social change. Groups become empowered through collective action (Staples, 1990; Hur, 2006) in a collaborative way. In carefully reviewing the conceptual interrelations between the dimensions of collective empowerment, four components can be extracted: collective belonging, working together for collective goals, gaining forces to achieve shared goals, and community building among group members (Hur, 2006).

Relationship between E-Learning and Empowerment

The objectives of learning, regardless of its type (e.g., traditional in-class learning or e-learning online) go beyond knowledge transfer. As described in the concept of heutagogy, empowerment should be considered as just one of these objectives. School-based learning might focus on knowledge transfer, knowledge enrichment, and knowledge enhancement. However, the objectives of e-learning have to be expanded beyond those of traditional school-based learning. E-learning can not only concentrate on the three previously mentioned traditional objectives, but also has to focus on knowledge synthesis and empowerment. Therefore, the final objective of e-learning has to be oriented toward individual and collective empowerment.

E-learning emerged in the field of education approximately 20 years ago. Since then, a variety of pedagogical designs for optimizing e-learning have been developed. These designs include scenario-based learning, goal-based learning, problem-based learning, and case-based learning. A variety of e-learning content types have been developed, including text, audio, visuals, games, and blended types. E-learning has also been utilized in the workplace as its benefits have been identifiable from the workplace point of view (Batakka-Busquests & Oacheco-Bernal, 2013; Berge & Giles, 2006).

E-learning has been recognized as an appropriate educational mechanism for excluded individuals and communities having few, if any, degrees of freedom to engage with open learning to help reduce or remove these disempowering conditions (Lane, 2009). Some authors (Palloff & Pratt, 1999) have argued that students in an online learning environment learn what it takes to pace themselves in order to get the job done. In this process, they become increasingly confident in their abilities and feel empowered to work in a manner that best suits them. However, e-learning has rarely been practiced for individual and collective empowerment in the real world except for the Sunhara Walmart project in India (Jimenez, 2012), an agricultural development and empowerment initiative that works with 2,500 women farmers in Ghaziabad and Agra on overall socioeconomic empowerment. The project was established by Agribusiness Systems International with funding from the Walmart Foundation and has implemented e-learning centers to counter the constraints that women face, such as

The Influence of E-Learning on Individual and Collective Empowerment in the Public Sector : An Empirical Study of Korean Government Employees

Hur and Im

illiteracy, transportation difficulties, and low market prices.

In addition, empirical studies to test the relationship between e-learning and empowerment have rarely been conducted, and only a couple of studies have been published in journals. One was about empowering disabled people through e-learning. The paper was not written based on empirical data, but rather to address the challenges to helping people with intellectual disabilities easily learn the activities of daily living (Barrera et al., 2008). The other paper was a review study on e-learning for the empowerment of teaching and learning in higher education. It described the basic ideas of e-learning, modalities of e-learning, media influences in the e-learning process, and various pedagogical designs of e-learning (Gandhi, 2011).

Our study explores the relationship between e-learning and empowerment based on data collected from government employees with experience in e-learning activities. We conducted a set of multiple regression analyses to explore how effectively e-learning has contributed to participants' individual and collective empowerment. For these regression analyses, various dimensions of individual and collective empowerment were employed as dependent variables, while attributes of e-learning, modalities of e-learning, and lecture types of e-learning were used as independent variables.

Methodology

Data Collection

A questionnaire was developed to survey both individual and collective empowerment among central government employees. Korea's central government consists of 41 ministries, of which 21 are headed by ministers and the other 20 are headed by vice ministers. The survey was carried out with the cooperation of each ministry's education and training officer (ETO). A questionnaire was sent to the ETOs of 41 ministries via email. The ETOs distributed the questionnaire to individuals in their ministries who have taken e-learning classes offered by the COTI during the first half of 2012. Out of more than 1,000 e-learning class attendees, 161 responded to the questionnaire survey.

Dependent Variables

In this study, a set of multiple regression models was employed to explore significant predictors of government employees' individual and collective empowerment in e-learning environments. Using existing literature on empowerment theories, a set of 16 questions was developed. These questions related to one of four components of individual and collective empowerment (i.e., meaning or awareness of limited potential, competence, self-determination, and collective empowerment). A factor analysis was

The Influence of E-Learning on Individual and Collective Empowerment in the Public Sector : An Empirical Study of Korean Government Employees

Hur and Im

conducted to condense 16 individual variables into several large categories. As can be seen in Table 1, four factors were extracted from the 16 questions. Factor 1 was composed of three questions and could be characterized as the meaning factor; the reliability coefficient (alpha) of Factor 1 was 0.949, showing strong internal consistency among the three variables. This meaning variable, representing a dimension of individual empowerment, refers to an awareness of an individual's limited potential to change the circumstance (Robins et al., 1998, p. 91).

Factor 2 constituted three questions and represented the competence factor; the reliability coefficient of Factor 2 was 0.960, also representing strong intercorrelations among the three variables. Factor 3 was composed of five questions and characterized as the self-determination factor; the reliability coefficient was 0.968, showing a strong internal consistency among the five variables. Factor 4 consisted of five questions and was characterized as the collective empowerment factor; the reliability coefficient was 0.980, representing strong intercorrelations among the five variables. Therefore, the original set of 16 questions was condensed into four factors, which individually stand for the dimensions of both individual and collective empowerment. The former three factors correspond to individual empowerment and the last factor stands for collective empowerment. Each of the four factors' coefficients was utilized as dependent variables for this study.

Table 1

Rotated Component Matrix: Individual Empowerment and Collective Empowerment

Questions	Individual empowerment			Factor 4 Collective empowerment	Alpha
The e-learning class contributed to the improvement of:	Factor 1 Meaning	Factor 2 Competence	Factor 3 Self-determination		
Understanding capabilities of knowledge in current workplace affairs	.855	.287	.219	.241	.949
Learning capabilities of knowledge in current workplace affairs	.871	.240	.226	.285	.949
Knowledge accumulation in current workplace affairs	.777	.380	.323	.150	.949
Involvement competence in current workplace affairs	.438	.765	.268	.300	.960
Competence in the	.404	.774	.310	.299	.960

The Influence of E-Learning on Individual and Collective Empowerment in the Public Sector : An Empirical Study of Korean Government Employees

Hur and Im

implementation of current workplace affairs					
Involvement competence in new workplace affairs	.353	.751	.357	.300	
Capabilities of self-expression	.285	.312	.726	.454	
Capabilities of selecting better alternatives	.402	.260	.742	.354	
Capabilities of making decisions on particular problems	.343	.221	.741	.437	.968
Capabilities of taking challenges	.180	.292	.753	.423	
Capabilities of taking initiatives	.218	.244	.726	.485	
Capabilities of making relations with others	.235	.248	.573	.659	
Capabilities of working together with others	.243	212	.373	.841	
Capabilities of building teams	.237	.198	.400	.836	.980
Capabilities of building coalitions	.184	.288	.365	.842	
Capabilities of solving problems with others	.252	.286	.383	.797	

Independent Variables

Independent variables were selected from e-learning class participation frequencies, attributes of an e-learning class, objectives of taking an e-learning class, preference of an e-learning class to an offline class, modalities of an e-learning class, and lecture types of an e-learning class. Participation frequencies refer to the number of times that an individual government employee has taken e-learning classes for the first half of 2012. The attributes of e-learning can be summarized as three As, referring to its features of engaging in e-learning anytime, anywhere, and in any classes. To explore the relationship between the three attributes and employees' empowerment, two dummy variables were selected (see Table 2).

The objectives of government employees' taking an e-learning class can be summarized as improvement of current job performance, career development, and promotion. In order to explore the influence of these respective objectives on their empowerment, two dummy variables were employed (see Table 2). The variable "preference of e-learning

The Influence of E-Learning on Individual and Collective Empowerment in the Public Sector : An Empirical Study of Korean Government Employees

Hur and Im

class to offline class" was measured with a seven-point scale (1 = *dislike e-learning class very much compared to an offline class*, 7 = *like e-learning class very much*). Based on the possibility of interactive learning with class participants, the modalities of the e-learning activity in this study were categorized into individualized self-paced e-learning and group-based e-learning. Interactive learning with class participants is limited in the former setting whereas it is widely open in the latter setting. One dummy variable was employed for this variable. In addition, one dummy variable was utilized for lecture types of e-learning, as this variable can be classified into delivery class and discussion class. In the delivery setting, the interaction between students and lectures is limited whereas it is widely open in the discussion setting.

Table 2

Independent Variables and Their Measurements

Independent variables		Measurements	Name
Participation frequencies		Number of participation times	Num
Attributes of e-learning class	Anytime	Yes = 1, no = 0	D1
	Anywhere	Yes = 1, no = 0	D2
	Any class	n/a[1]	
Objectives of taking an e-learning class	Improvement of current job performance	Yes = 1, no = 0	D3
	Career development	Yes = 1, no = 0	D4
	Promotion	n/a[2]	
Preference of e-learning class to offline class		7-point scale	Pref
Modalities of e-learning activity	Individualized self-paced e-learning	Yes = 1, no = 0	D5
	Group-based e-learning	n/a[3]	
Lecture types of e-learning class	Delivery class	Yes = 1, no = 0	D6
	Discussion classes	n/a[4]	

Note. n/a[1]: "Any class" served as the baseline for comparison with the two other attributes noted. n/a[2]: "Promotion" served as the baseline for comparison with the two other attributes noted. n/a[3]: "Group-based e-learning" served as the baseline for comparison with "individualized self-paced e-learning." n/a[4]: "Discussion class" served as the baseline for comparison with "delivery class."

Statistical Analysis

Each of the four factors extracted from the factor analysis was utilized as a dependent variable in the multiple regression analysis in this study. The first three equations stood for individual empowerment and the last one for collective empowerment. The four equations of the multiple regression analysis employed in this study were as follows:

Meaning Scale = a + b*Num* + c*D1* +d*D2* + e*D3* + f*D4* + g*Pref* + h*D5* + i*D6*

Competence Scale = a + b*Num* + c*D1* +d*D2* + e*D3* + f*D4* + g*Pref* + h*D5* + i*D6*

The Influence of E-Learning on Individual and Collective Empowerment in the Public Sector : An Empirical Study of Korean Government Employees

Hur and Im

Self-Determination Scale = a + bNum + c$D1$ +d$D2$ + e$D3$ + f$D4$ + g$Pref$ + h$D5$ + i$D6$

Collective Empowerment Scale = a + bNum + c$D1$ +d$D2$ + e$D3$ + f$D4$ + g$Pref$ + h$D5$ + iD

Results

Government Employees' Individual and Collective Empowerment

The level of government employees' individual and collective empowerment was drawn from a simple descriptive statistical analysis based on the four dimensions of individual and collective empowerment drawn from a factor analysis. The results showed that government employees have been more greatly empowered on an individual basis than a collective basis. As seen in Table 3, the average level of individual empowerment was significantly higher than that of collective empowerment. The former was 4.55 on a seven-point scale, while the latter was 4.21, and the difference was statistically significant. In addition, they were more greatly empowered in the meaning dimension than in the other two as well as in the competence dimension than in the self-determination dimension. Table 3 indicates that the average level of the meaning dimension was greater than the competence dimension, and the competence dimension was greater than the self-determination dimension. The differences among the three dimensions were statistically significant.

In carefully reviewing these results, an interesting sequentiality emerged in the levels of both the three dimensions of individual empowerment and the individual and collective empowerment. Reasoning inductively based on this sequentiality, it can be concluded that government employees were empowered in the awareness of their potential or capabilities before being empowered in their competence. Self-determination was achieved based on two components (e.g., meaning and competence). Government employees were also collectively empowered based on their individual empowerment.

The Influence of E-Learning on Individual and Collective Empowerment in the Public Sector : An Empirical Study of Korean Government Employees

Hur and Im

Table 3

Government Employees' Individual and Collective Empowerment

Dimensions of empowerment		Mean	Std Div.	Paired-sample	t(sig.)	Mean	t(sig.)
Individual Empowerment	Meaning	4.83	.99	Meaning vs. competence	6.338 (.000)	4.55	5.178 (.000)
	Competence	4.49	1.06	Competence vs. self-determination	2.783 (.006)		
	Self-determination	4.30	1.21	Meaning vs. self-determination	7.372 (.000)		
Collective empowerment		4.21	1.31	-	-	4.21	

Influential Variables on Individual and Collective Empowerment

Overview.

Four multiple regression analyses were conducted to explain the variability of the four dependent variables. Each model uncovered its own set of variables that played a role in empowerment. As seen in Table 4, the predictor variables of the meaning dimension were more widely split than those of the competence dimension or the self-determination dimension and collective empowerment.

Only one independent variable—preference of e-learning class to offline class—was associated with all four dependent variables. However, modalities of e-learning activity, which were expected to be a significant predictor of empowerment, were not associated with any of the four dependent variables. In addition, lecture types of the e-learning class were also expected to be a significant predictor of empowerment but were only associated with the competence dimension. In a broad sense, government employees' preference of e-learning to an offline class mattered significantly. Commitment to an e-learning class rather than an offline class could be described as a critical predictor of individual and collective empowerment. Participation frequencies could be identified as a significant predictor of the meaning dimension, but they were not a significant predictor of the other three dimensions.

Variables associated with the meaning dimension.

Four of the eight independent variables in the multiple regression analysis were significantly associated with the meaning dimension. These four variables were split into participation frequencies, attributes of an e-learning class, objectives of taking an e-learning class, and preference of an e-learning class to an offline class.

The Influence of E-Learning on Individual and Collective Empowerment in the Public Sector : An Empirical Study of Korean Government Employees

Hur and Im

The meaning dimension showed a significant relationship with the participation frequencies variable. Government employees who have attended e-learning classes more frequently showed a higher level of the meaning dimension. One attribute of the e-learning class, the convenience of attending anytime, was identified as a significant predictor associated with the meaning dimension. Thus, those who would buy an e-learning class due to the convenience of attending anytime showed a higher level of the meaning dimension than those who would buy a class due to one of the other two attributes (i.e., anywhere and any class). One objective of taking an e-learning class, career development, was identified as a significant predictor associated with the meaning dimension. This result indicated that those who would take an e-learning class to pursue career development showed a lower level of the meaning dimension than those who would take it for the purpose of the other two objectives (i.e., improvement of current job performance and promotion). Finally, the variable preference of an e-learning class to an offline class was explored as a significant predictor of the meaning dimension; those who found themselves more attracted to an e-learning class than an offline class showed a higher level of the meaning dimension.

To summarize these findings, government employees could be more greatly empowered in the meaning dimension if they tried to participate in e-learning classes more frequently, buy the convenience of attending an e-learning class anytime, attend the class for the purpose of improving in their current job performance and promotion, and be more attracted to an e-learning class than an offline class. In these situations, they would possibly promote their understanding and learning capabilities of knowledge in their workplace affairs and knowledge promotion in current workplace affairs.

Variables associated with the competence dimension.

Three of the eight independent variables in the multiple regression analysis were significantly associated with the competence dimension. The predictors of the competence dimension were split into objectives of taking an e-learning class, preference of an e-learning class to an offline class, and lecture types of an e-learning class.

The competence dimension showed a significant relationship with one objective of taking an e-learning class: improvement of current job performance. This finding indicated that those who would take an e-learning class for the purpose of improvement of current job performance showed a higher level of competence than those who would take it for the purpose of career development and promotion. The preference of an e-learning class to an offline class variable was also identified as a significant predictor of the competence dimension, meaning that those who found themselves more attracted to an e-learning class than an offline class showed a higher level of competence. Finally, the lecture types of an e-learning class were also identified as a significant predictor of the competence dimension, meaning that those who would prefer a delivery class to a discussion class showed a lower level of the competence dimension.

The Influence of E-Learning on Individual and Collective Empowerment in the Public Sector : An Empirical Study of Korean Government Employees

Hur and Im

Thus, government employees could be more greatly empowered in the competence dimension if they tried to take an e-learning class to improve their current job performance, to be more attracted to an e-learning class than an offline class, and to participate in the discussion class rather than the delivery class. In these situations, they could end up promoting their involvement competence in current workplace affairs, competence in the implementation of current workplace affairs, and involvement competence in new workplace affairs.

Variables associated with self-determination.

Only two of the eight independent variables showed a significant relationship with the self-determination dimension: attributes of an e-learning class and preference of an e-learning class to an offline class. One attribute of an e-learning class, convenience of attending anytime, was identified as a significant predictor associated with the self-determination dimension. This result represented that those who would buy an e-learning class due to the convenience of attending anytime showed a higher level of the self-determination dimension than those who would buy one of the other two attributes of an e-learning class (i.e., anywhere and any class). The preference of an e-learning class to an offline class variable was also explored as a significant predictor of the self-determination dimension, meaning that those who found themselves more attracted to an e-learning class than an offline class showed a higher level of self-determination.

In summary, government employees could be more greatly empowered in the self-determination dimension if they tried to buy the convenience of attending an e-learning class anytime and to be more attracted to an e-learning class than an offline class. In these situations, they would possibly promote their capabilities of self-expression, selecting better alternatives, making decisions on particular problems, taking challenges, and taking initiatives.

Variables associated with collective empowerment.

Only two of the eight independent variables showed a significant relationship with collective empowerment: objectives of taking an e-learning class and preference of an e-learning class to an offline class. Career development as an objective of taking an e-learning class was identified as a significant predictor of collective empowerment. This result indicated that those who would take an e-learning class for the purpose of career development showed a lower level of collective empowerment than those who would take it for the other two purposes (i.e., improvement of current job performance and promotion). The preference of an e-learning class to an offline class variable was identified as a significant predictor of collective empowerment, meaning that those who found themselves more attracted to an e-learning class than an offline class showed a higher level of collective empowerment.

The term *collective empowerment*, from a theoretical perspective, refers to various efforts, such as team building, collaboration, and coalition building. Government

The Influence of E-Learning on Individual and Collective Empowerment in the Public Sector : An Empirical Study of Korean Government Employees

Hur and Im

employees could be more greatly empowered in collective empowerment if they tried to attend the class for the purpose of improving their current job performance and promotion and to be more attracted to an e-learning class than an offline class. In these contexts, they would promote their capabilities of making relations with others, working together with others, building teams with their peer groups, building coalitions, and effectively solving issues with others.

Table 4

Summary of Individual and Collective Empowerment Predictors

Independent variables		Individual empowerment									Collective empowerment		
		Meaning			Competence			Self-determination					
		b	t	p	b	t	p	b	t	p	b	t	p
Constant		-2.283	-3.101	.002	-.900	-1.169	.224	-1.339	-1.679	.096	-1.378	-1.793	.075
Participation frequencies		.007	1.774	.078*	-.006	-1.509	.134	-.003	-.748	.456	.001	.228	.820
Attributes of e-learning class [a]	Anytime	.520	2.140	.034*	.410	1.6161	.109	-.446	-1.698	.092*	-.019	-.077	.939
	Anywhere	.141	.437	.663	.304	.898	.371	-.476	-1.360	.176	.308	.912	.364
Objectives of taking e-learning class [b]	Improvement of current job performance	-.067	-.329	.742	.372	1.739	.084*	.023	.105	.916	.103	.481	.631
	Career development	-.435	-1.809	.073*	-.348	-1.385	.168	-.335	-1.287	.200	-.443	-1.769	.079*
Preference of e-learning class to offline class		.445	4.289	.000*	.336	3.102	.002*	..233	2.077	.040*	.375	3.463	.001*
Modalities of e-learning activity [c]	Individualized self-paced e-learning	.063	.603	.548	-.026	-.240	.811	.047	.411	.682	-.030	-.227	.783
Lecture types of e-learning class [d]	Delivery class	-.179	-.366	.715	-.845	-1.654	.100*	.695	1.314	.191	-.204	-.400	.690
R^2		.198			.147			.116			.146		
F, p		3.960, .000***			2.749, .008***			2.012, .049**			2.725, .008***		

* $p \leq 0.10$, **$p \leq .05$, ***$p \leq .01$

Note. [a]: "Any class" serves as the baseline for comparison. [b]: "Promotion" serves as the baseline for comparison. [c]: "Group-based e-learning" serves as the baseline for comparison. [d]: "Discussion class" serves as the baseline for comparison. Refer to Table 2.

The Influence of E-Learning on Individual and Collective Empowerment in the Public Sector : An Empirical
Study of Korean Government Employees

Hur and Im

Discussion

E-learning has many valuable usages. It has extended education arenas from a limited offline classroom to cyberspace and has expanded education opportunities from students to all members of society. Moreover, e-learning might ultimately contribute to changing the course of education from knowledge transfer and enhancement to the promotion of empowerment. This study demonstrated the possibilities that e-learning would influence the promotion of individual and collective empowerment. In a broad sense, both attributes of e-learning and objectives of taking e-learning classes were significantly associated with individual empowerment, and taking an e-learning class and preference of an e-learning class to an offline class were identified as significant predictors of collective empowerment. These findings could offer evidence that the e-learning mechanism contributed to the promotion of individual and collective empowerment.

However, contrary to our expectations, both modalities of e-learning activity and lecture types of e-learning could not be considered significant predictors of individual and collective empowerment. Only the lecture types of an e-learning class were associated with the competence dimension of individual empowerment. Group-based e-learning rather than individualized self-paced e-learning could provide participants with better opportunities to be collectively empowered, but it was not significantly associated with individual and collective empowerment. These results might stem not from the availability of various modalities and lecture types, but from the lack of vitalization of these modalities and lecture types. In other words, e-learning in an interactive way among class participants as well as between lecturers and students is not yet significantly associated with empowerment, but will be possibly associated with empowerment under the condition of their vitalization.

Government employees have been sequentially empowered from acquiring the sense of meaning and competence to becoming self-determined and from gaining individual empowerment to achieving collective empowerment. As Thomas and Velthouse (1990) mentioned, a sense of meaning is likely to become a greenhouse in which the concept of competence is generated and growing as a result. Both meaning and competence seem to become a greenhouse in which the concept of competence is generated and thus growing. Ultimately, individual empowerment is a greenhouse in which collective empowerment is generated and growing. According to the empirical analysis in this study, a relatively lower level of empowerment was more easily gained than a higher level of empowerment in terms of individual empowerment. In addition, individual empowerment was more easily acquired than collective empowerment.

Each of the four dimensions of empowerment has its own predictors. No unique patterns were found in the predictors. However, lower levels of empowerment dimensions were associated with a relatively large number of predictors whereas higher levels of empowerment dimensions were correlated with a relatively small number of

The Influence of E-Learning on Individual and Collective Empowerment in the Public Sector : An Empirical Study of Korean Government Employees

Hur and Im

predictors. These results indicate that government employees were not efficiently empowered at the higher dimensions of empowerment, although lower dimensions can become a greenhouse for higher dimensions, and that e-learning might not be an effective learning instrument in achieving a higher level of empowerment, but it could be in achieving a lower level of empowerment.

As previously mentioned, only one independent variable—preference of an e-learning class to an offline class—was associated with all four dependent variables. Meanwhile, modalities of e-learning activity were not associated with any of the four dependent variables. In addition, lecture types of e-learning were associated only with the competence dimension. Delivering e-learning in an interactive way between participants and lecturers could contribute to the improvement of government employees' competence level. In a broad sense, neither modality of e-learning activity or lecture types of e-learning were a critical predictor of individual and collective empowerment. It did not matter whether government employees selected an individualized self-paced e-learning activity or a group-based e-learning activity. Rather, their preference of e-learning to an offline class mattered significantly. Commitment to an e-learning class rather than an offline class could be described as a critical predictor of individual and collective empowerment. Participation frequency could be identified as a significant predictor of the meaning dimension, but it was not a significant predictor of the other three dimensions.

Conclusions

The findings in this study showed that e-learning could be described as an effective mechanism for government employees' individual and collective empowerment. However, the results fell short of our expectations. The ultimate objective of e-learning being provided for government employees was to overcome a sort of trained incapacity problem that is widespread in the government sector. Government employees being empowered at lower levels might not effectively cope with trained incapacity as well as when carrying out creative jobs. Customized e-learning devices for the improvement of self-determination and collective empowerment need to be developed and made available for government employees. More exquisite and elaborate strategies in the development and operation of e-learning are also needed.

Online discussion classes, if designed to encourage interactivity, can enhance the promotion of empowerment. In our study, these classes were not found to be positively associated with any types of empowerment. However, it might be hasty to conclude that discussion classes do not matter significantly in the promotion of empowerment. An effective e-learning environment can afford various modalities of interaction between the three macro components: students, instructors, and content (Anderson, 2004). Based on these three components, six typologies of interaction can be presented:

The Influence of E-Learning on Individual and Collective Empowerment in the Public Sector : An Empirical Study of Korean Government Employees

Hur and Im

student–student, student–instructor, student–content, instructor–instructor, instructor–content, and content–content. These typologies have to be appropriately used as the basis of the educational process in an online discussion environment (Balaji & Chakrabarti, 2010). Typological readiness has not been verified in this study. Thus, further studies are needed on this issue.

This paper discussed an empirical study that was conducted, but with a limited target area (i.e., Korea's government sector). Individuals in the private sectors or in other educational environments might respond to e-learning in a different way. Further studies are required to generalize theories found in our study.

The Influence of E-Learning on Individual and Collective Empowerment in the Public Sector : An Empirical Study of Korean Government Employees

Hur and Im

References

Adler, P. S. (2012). The sociological ambivalence of bureaucracy: From Weber via Gouldner to Marx. *Organization Science, 23*(1), 244-266.

Anderson, B., Brown, M., Murray, F., Simpson, M., & Mentis, M. (2006). *Global picture, local lessons: E-learning policy and accessibility*. Retrieved from http://cms.steo.govt.nz/NR/rdonlyres/C1EBB9EB-9122-4F82-94BB-A713CDEE9D02/0/AndersonFinalReport.pdf.

Anderson, T. (2004). Towards a theory of online learning. In T. Anderson & F. Elloumi (Eds.), *Theory and practice of online learning* (pp. 33-60). Edmonton: AB: Athabasca University Press.

Balaji, M. S., & Chakrabarti, D. (2010). Student interactions in online discussion forum: Empirical research from 'media richness theory' perspective. *Journal of Interactive Online Learning, 9*(1), 1-22.

Barrera, C., Olga C. S., Gutierrez, E., Boticario, J. G., Moranchel, J., Roldan, J. R., & Casas, T. (2008). *Empowering disabled people: E-learning challenges for independent live.* aDeNu Research Group, Artificial Intelligence Department, Computer Science School, Spanish National University of Distance Education.

Batalla-Busquests, J-M., & Pacheco-Bernal, C. (2013). On-the-job e-learning: Workers' attitudes and perceptions. *The International Review of Research in Open and Distance Learning, 14*(1), 40-64.

Benson, L., Elliot, D., Grant, M., Holschuh, D., Kim, H., et al. (2002). Usability and instructional design heuristics for e-learning evaluation. In *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2002* (pp. 1615-1621). Presented at the World Conference on Educational Multimedia, Hypermedia and Telecommunications (EDMEDIA), Chesapeake, VA: AACE.

Berge, Z. L., & Giles, L. (2006). Implementing and sustaining e-learning in the workplace. *International Journal of Information and Communication Technology Education, 2*(4), 64-75.

Blaschke, L. M. (2012). Heutagogy and lifelong learning: A review of heutagogical practice and self-determined learning. *The International Review of Research in Open and Distance Learning, 13*(1), 56-71.

Boehm, A., & Staples, L. H. (2004). Empowerment: The point of view of customer. *Families in Society, 85*(2), 270-280.

The Influence of E-Learning on Individual and Collective Empowerment in the Public Sector : An Empirical Study of Korean Government Employees

Hur and Im

Brown, M., Anderson, B., & Murray, F. (2007). E-learning policy issues: Global trends, themes and tensions. In *ICT: providing choices for learners and learning. Proceedings ascilite*. Singapore. Retrieved from http://www.ascilite.org.au/conferences/singapore07/procs/brown.pdf.

Clark, R. (2002). Six principles of effective e-learning: What works and why. *The e-Learning Developer's Journal*, 1-10.

Dodd, P., & Gutierrez, L. M. (1990). Preparing students for the future: A power perspective on community practice. *Administration in Social Work, 14*(2), 63-78.

Govindasamy, T. (2002). Successful implementation of e-learning pedagogical considerations. *The Internet and Higher Education, 4*(3), 287-299.

Gutierrez, L. M. (1990). Working with women with color: An empowerment perspective. *Social Work*, 35(2), 149-153.

Halawi, L. A., McCarthy, R. V., & Pires, S. (2009). An evaluation of e-learning on the basis of Bloom's Taxonomy: An exploratory study. *Journal of Education for Business, 84*(6), 374-380.

Hur, M. H. (2006). Empowerment in terms of theoretical perspectives: Exploring a typology of the process and components across disciplines. *Journal of Community Psychology, 34*(5), 523-540.

Im, Y., & Bastusta, D. (2009). Conceptualizing a cyber university model in support of effective ESD. *Asia Pacific Collaborative Education Journal, 5*(1).

Jimenez, A. (2012). Empowering women farmers through e-learning in India. *E-agriculture*. Retrieved from http://www.e-agriculture.org/news/empowering-rural-women-farmers-through-e-learning-india.

Lane, A. (2009). The impact of openness on bridging educational digital divides. *International Review of Research in Open and Distance Learning, 10*(5), 17-26.

Lee, L. (1994). *The empowerment approach to social work practice*. New York: Columbia University.

Leppisaari, I., Herrington, J., Vainio, L., & Im, Y. (2013). Authentic e-learning in a multicultural context. *Journal of Interactive Learning Research, 24*(1), 53-73.

Moore, J. L., Dickson-Deane, C., & Galyen. K. (2011). E-Learning, online learning, and distance learning environments: Are they the same? *Internet and Higher Education, 14*, 129–135.

The Influence of E-Learning on Individual and Collective Empowerment in the Public Sector : An Empirical Study of Korean Government Employees

Hur and Im

Nichols, M. (2003). A theory of e-learning. *Educational Technology & Society, 6*(2), 1-10.

Owens, J. D., & Price, L. (2010). Is e-learning replacing the traditional lecture? *Educational and Training Journal, 52*(2), 128-139.

Page, N., & Czuba, C. E. (1999). Empowerment: What is it? *Journal of Extension*, *37*(5), 24-32.

Palloff , R. M., & Pratt, K. (1999). *Building learning communities in cyberspace: Effective strategies for the online classroom*. San Francisco, CA: Jossey-Bass.

Phang, C. W., Kankanhalli, A., & Ang, C. (2008). Investigating organizational learning in egovernment projects: A multi-theoretic approach. *Journal of Strategic Information Systems, 17*, 99-123.

Sangrà, A., Vlachopoulos, D., & Cabrera, N. (2012). Building an inclusive definition of e-learning: An approach to the conceptual framework. *The International Review of Research in Open and Distance Learning, 13*(2), 140-159.

Spreitzer, G. M., Kizilos, M. A., & Nason, S. W. (1997). A dimensional analysis of talk about disability. *American Journal of Community Psychology*, 28(5), 671-695.

Staples, L. H. (1990). Powerful ideas about empowerment. *Administration in Social Work*, 14(2), 29-42.

Stein, S. J., Shephard, K., & Harris, I. (2011). Conceptions of e-learning and professional development for e-learning held by tertiary educators in New Zealand. *British Journal of Educational Technology, 42*(1), 145-165.

Terblanche, F. (2003). Empowering people in organization. *Mousaion, 21*(2), 127-137.

Thomas, K., & Velthouse, B. (1990). Cognitive elements of empowerment: An interpretive model intrinsic task motivation. *Academy of Management Review*, *15*, 666-681.

Trindade, A. R., Carmo, H., & Bidarra, E. (2000). Current developments and best practice in open and distance learning. *International Review of Research in Open and Distance Learning, 1*(1), 1-25.

Turner, B. S. (1976). Manpower planning or trained incapacity? *Australian Journal of Public Admtration, 34*(3), 258-280.

The Influence of E-Learning on Individual and Collective Empowerment in the Public Sector : An Empirical
Study of Korean Government Employees

Hur and Im

van Zyl, J. M., Els, C. J., & Blignaut, A. S. (2013). Development of ODL in a newly
industrialized country according to face-to-face contact, ICT, and e-readiness.
International Review of Research in Open and Distance Learning, 14(1), 84-
105.

Athabasca University

OERScout Technology Framework: A Novel Approach to Open Educational Resources Search

Ishan Sudeera Abeywardena[1], **Chee Seng Chan**[2,] and **Choy Yoong Tham**[1]
[1]Wawasan Open University, Malaysia, [2]University of Malaya, Malaysia

Abstract

The open educational resources (OER) movement has gained momentum in the past few years. With this new drive towards making knowledge open and accessible, a large number of OER repositories have been established and made available online throughout the world. However, the inability of existing search engines such as Google, Yahoo!, and Bing to effectively search for useful OER which are of acceptable academic standard for teaching purposes is a major factor contributing to the slow uptake of the entire movement. As a major step towards solving this issue, this paper proposes *OERScout*, a technology framework based on text mining solutions. The objectives of our work are to (i) develop a technology framework which will parametrically measure the usefulness of an OER for a particular academic purpose based on the openness, accessibility, and relevance attributes; and (ii) provide academics with a mechanism to locate OER which are of an acceptable academic standard. From our user tests, we have identified that OERScout is a sound solution for effectively zeroing in on OER which can be readily used for teaching and learning purposes.

Keywords: OERScout; open educational resources; OER; OER search; desirability of OER; OER metadata

Introduction

Open educational resources (OER) have the potential to become a major source of freely reusable teaching and learning resources, especially in higher education (HE). The UNESCO Paris OER Declaration (2012) defines OER as

> teaching, learning and research materials in any medium, digital or otherwise, that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions. Open licensing is built within the existing framework of intellectual property rights as defined by relevant international conventions and respects the authorship of the work.

Claims have also been made by Caswell, Henson, Jenson, and Wiley (2008) that the move towards OER can significantly reduce the costs of learning. Thus, OER has the potential to broaden access and provide equity in education. This is especially important for countries in the Global South.

The recently concluded "OER Asia" study (Dhanarajan & Abeywardena, 2013) surveyed 420 junior to senior academics from public and private HE institutions in nine countries representing a majority of sub-regions in Asia. Based on this study, Abeywardena, Dhanarajan, and Chan (2012) state that 57.4% of the academics feel the lack of ability to locate specific and relevant resources using existing search engines to be a serious inhibitor of the use of OER. It is further pointed out that, in general, academics search and locate OER which are freely available on the Internet. However, many of these resources have not been subjected to academic quality assurance (QA) procedures imposed by degree accrediting organisations such as the Malaysian Qualifications Agency (MQA)[1]. In contrast, institutional and peer-reviewed OER repositories maintain an acceptable level of academic quality of material. These materials can be readily used and reused for teaching purposes. Furthermore, these repositories are equipped with native search mechanisms which facilitate the searching of relevant OER for a particular teaching need. Unfortunately, according to the study, only 43.2% of the academics use native search facilities of OER repositories. On the other hand, generic search engines such as Google, Yahoo!, and Bing are found to be used by 96.9% of the academics for OER search.

From this comparison, it is apparent that many academics depend on generic search mechanisms to locate the required OER for their teaching purposes. As a result, the inability of these generic mechanisms to locate useful OER for a particular teaching need, as will be discussed, has in fact become an inhibitor to the wider adoption of OER for teaching in Asia. In order to overcome this barrier, a centralised search mechanism

---

[1] http://www.mqa.gov.my

which can locate academically useful OER needs to be introduced. As a major step towards solving this issue, in this paper, we propose *OERScout*, a technology framework based on text mining solutions. The objectives of our work are to (i) develop a technology framework which will parametrically measure the usefulness of an OER for a particular academic purpose based on the openness, accessibility, and relevance attributes; and (ii) provide a search mechanism to effectively zero in on OER which are of an acceptable academic standard.

The rest of the paper is structured as follows: The Literature Review section gives an overview of the current solutions available to search for OER; the Methodology section details the proposed method; the Results and Discussion sections provide the expert user test results and discussion respectively; and the Conclusion concludes the work and discusses some future work. Overall, the paper provides a holistic view of the complete project.

Literature Review

Most current OER initiatives are based on established web technology platforms and have accumulated large volumes of quality resources. However, one limitation inhibiting the wider adoption of OER is the current inability to effectively search for academically useful OER from a diversity of sources (Yergler, 2010). This limitation of locating "fit-for-purpose" (Calverley & Shephard, 2003) resources is further heightened by the disconnectedness of the vast array of OER repositories currently available online. As a result, West and Victor (2011) argue that there is no single search engine which is able to locate resources from all the OER repositories. Furthermore, according to Dichev and Dicheva (2012), one of the major barriers to the use and reuse of OER is the difficulty in finding quality OER matching a specific context as it takes an amount of time comparable with creating one's own materials. Unwin (2005) argues that the problem with open content is not the lack of available resources on the Internet but the inability to effectively locate suitable resources for academic use. The UNESCO Paris OER Declaration (2012) states the need for more research in this area to "encourage the development of user-friendly tools to locate and retrieve OER that are specific and relevant to particular needs". Thus, the necessity for a system which could effectively search the numerous OER repositories with the aim of locating usable materials has taken centre stage.

The most common method of searching for OER is to use generic search engines such as Google, Yahoo!, or Bing. Even though this method is the most commonly used, it is not the most effective as discussed by Pirkkalainen and Pawlowski (2010, p. 2) who argue that "searching this way might be a long and painful process as most of the results are not usable for educational purposes".

Alternative methods for OER search can be broadly categorised into federated search and semantic search. Federated search is achieved either by searching across different repositories at runtime or by periodically harvesting metadata for offline searching.

Recent examples of federated search include (i) BRENHET² proposed by De la Prieta, Gil, Rodríguez, and Martín (2011), which is a multi agent system (MAS) which facilitates federated search between learning object repositories (LOR); (ii) OpeScout (Ha, et al., 2011), which copies metadata from existing repositories to create an index of resources accessible through a faceted search approach; (iii) Global Learning Object Brokered Exchange (GLOBE), which acts as a central repository of IEEE LOM educational metadata harvested from various member institutional repositories (Yamada, 2013); and (iv) Pearson's Project Blue Sky (Kolowich, 2012), which is a custom search engine specifically concentrating on searching for OER with an academic focus. Semantic search is derived from semantic web technologies where people are considered as producers or consumers and machines as enablers. Some of the recent semantic search initiatives are (i) the OER-CC ontology which describes various accessibility levels (Piedra, et al., 2010, 2011); (ii) the "Assistant" prototype proposed by Casali, Deco, Romano, and Tomé (2013), which helps users with respect to loading metadata through automation; (iii) the "Folksemantic" project which is a hybrid search system combining OCW Finder and OER Recommender (Shelton, Duffin, Wang, & Ball, 2010); and (iv) "Agrotags", a project concentrating on tagging resources in the agriculture domain (Balaji, et al., 2010). However, despite showing initial promise, only a handful of these solutions have proceeded beyond the prototype stage. Out of these, the ones which have become global players are mainly commercial ventures or global federations backed by philanthropic funding. One reason underpinning the relatively low success rate of these initiatives can be attributed to the current lack of a search methodology which takes into consideration the level of openness, the level of access, and the relevance of a resource for one's needs (Abeywardena, Raviraja, & Tham, 2012). Though one might argue that popular search engines provide advanced facilities to define various filter criteria which would refine the searches, these search engines however are not tailored to effectively locate OER material which are the most useful for a particular academic purpose. As such, OER consumers will need to resort to frequenting OER repositories to search for the resources they are after. Pirkkalainen and Pawlowski (2010) argue that native search mechanisms of repositories are relatively better at locating resources with increased usefulness. However, the problem is which repositories to choose within the large and constantly expanding global pool. Furthermore, users would be spending an extended amount of time on these repositories conducting multiple searches (Figure 1), making it an inefficient method for locating resources.
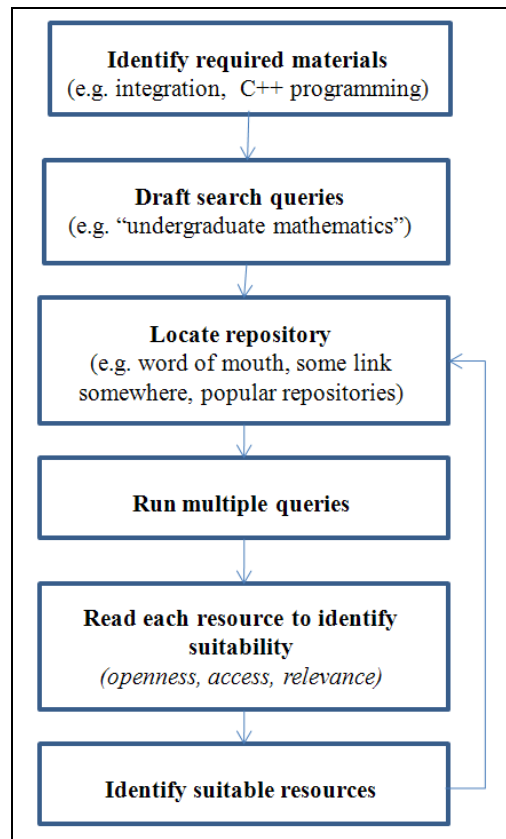
Figure 1. The flow of activities in searching for suitable OER on heterogenous repositories based on personal experience (Abeywardena, 2013). These activities will need to be repeated on multiple repositories until the required resources are located.

Another factor inhibiting effective OER search is the heterogeneity of OER repositories. Within the context of parametric web based search, this disparity can be broadly attributed to (i) the lack of a single metadata standard; (ii) the lack of a centralised search mechanism; and (iii) the inability to indicate the usefulness of an OER returned as a search result.

Metadata provides a standard and efficient way to conveniently characterize educational resource properties (Anido, Fernández, Caeiro, Santos, Rodriguez, & Llamas, 2002). The majority of existing search methodologies, including mainstream search engines, such as Google, work on the concept of metadata for locating educational resources. However, it can be argued that the annotation of resources with metadata cannot be made 100% accurate or uniform if done by the creator(s) of the resource (Barton, Currier, & Hey, 2003; Tello, 2007; Devedzic, Jovanovic, & Gasevic, 2007; Brooks & McCalla, 2006; Cechinel, Sánchez-Alonso, & Sicilia, 2009). Therefore the use of human annotated metadata in performing objective searches becomes subjective and inaccurate. A possible way to overcome this inaccuracy and to ensure uniformity of metadata is to utilise a computer based methodology which would consider the content,

domain, and locality of the resources, among others, for autonomously annotating metadata.

As a solution to these issues , this paper proposes the OERScout technology framework which accurately clusters text based OER by building a *keyword-document matrix* (KDM) using autonomously mined domain specific keywords. The advantage of our work is, using the KDM, the system generates ranked lists of relevant OER from heterogenous repositories to suit a given search query. The contribution of our work is two-fold: Firstly, we propose a technology framework for locating OER, which are useful for academic needs. In this regard, the advantage of OERScout over existing OER search methodologies is the incorporation of the *desirability* framework (Abeywardena, Raviraja, & Tham, 2012) in parametrically measuring the usefulness of an OER with respect to openness, accessibility, and relevance. Secondly, we introduce a novel methodology which allows academics to effectively zero in on OER which can be readily used for their teaching and learning purposes . We strongly believe that the OERScout system will broaden access and provide equity in education, particularly for countries in the Global South such as India, Pakistan, Afghanistan, Myanmar, and Sri Lanka to name a few.

Methodology

As discussed in the Literature Review, mainstream search engines, federated search, and semantic search are the key OER search methodologies adopted at present. However, all of these methodologies depend on human annotated metadata for approximating the usefulness of a resource for a particular need. Given the limitations of human annotated metadata with respect to accurately and uniformly describing resources, the accuracy of search becomes a function of the content creators' ability to accurately annotate resources. Therefore, the OERScout system uses text mining techniques to annotate resources using autonomously mined keywords.

The Algorithm

The OERScout text mining algorithm is designed to "read" text based OER documents and "learn" which academic domain(s) and sub-domain(s) they belong to. To achieve this, a *bag-of-words* approach is used due to its effectiveness with unstructured data (Feldman & Sanger, 2006). The algorithm extracts all the individual words from a particular document by removing noise such as formatting and punctuation to form the *corpus*. The corpus is then *tokenised* into the *list of terms* using the *stop words* found in the Onix Text Retrieval Toolkit[2] as shown in Figure 2.

---

[2] lextek.com/manuals/onix/stopwords1.html
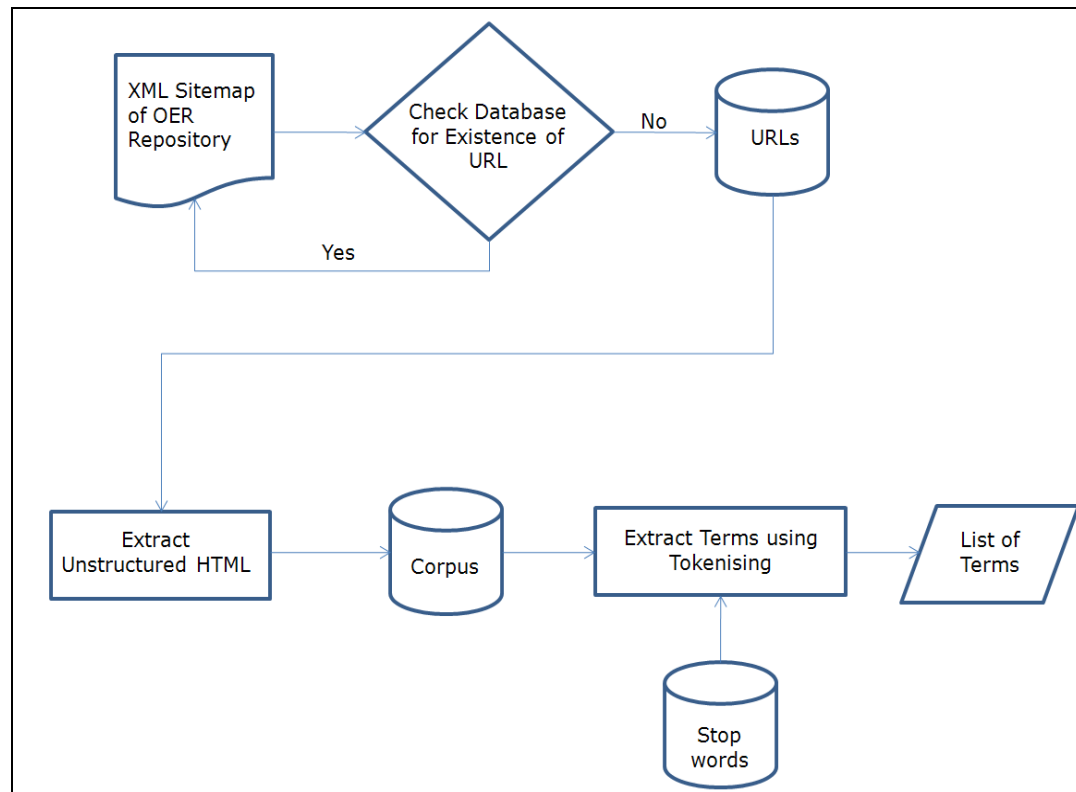
Figure 2. The list of terms is created by tokenising the corpus using the stop words found in the Onix Text Retrieval Toolkit.

The extraction of the content describing terms from the list of terms for the formation of the term document matrix (TDM) is done using the term frequency–inverse document frequency (TF-IDF) weighting scheme. The weight of each term (TF-IDF) is calculated using Equation 1 (Feldman & Sanger, 2006):

$$(TF\text{-}IDF)_t = TF_t \times IDF_t \quad (1)$$

TF_t denotes the frequency of a term t in a single document. IDF_t denotes the frequency of a term t in all the documents in the collection $[IDF_t = \text{Log} (N/TF_t)]$ where N is the number of documents in the collection. The probability of a term t being able to accurately describe the content of a particular document as a keyword decreases with the number of times it occurs in other related and non-related documents. For example the term "introduction" would be found in many OER documents which discuss a variety of subject matter. As such the TF-IDF of the term "introduction" would be low compared to terms such as "operating systems" or "statistical methods" which are more likely to be keywords. Due to the large number of documents available in OER repositories and their document lengths, the TF value of certain words will be quite high. As a result, there will be a considerable amount of noise being picked up while identifying the keywords. However, the large number of documents will also increase the IDF value of words reducing the TF-IDF value which results in the reduction of noise picked up as keywords. As such, the TF-IDF weighting scheme allows the system

to refine its set of identified keywords at each iteration. Therefore, the TF-IDF weighting scheme is found to be suitable for extracting keywords from the OER documents.

Keyword-Document Matrix (KDM)

The keyword-document matrix (KDM), a subset of the TDM, is created for the OERScout system by matching the autonomously identified keywords against the documents as shown in Figure 3.

	Keyword$_1$	Keyword$_2$	....	Keyword$_n$
Document$_1$	√			√
Document$_2$	√		√	
....		√		
Document$_n$		√		√

Figure 3. The keyword-document matrix (KDM), a subset of the TDM, is created for the OERScout system by matching the autonomously identified keywords against the documents.

The formation of the KDM (Figure 4) is done by (i) normalising the TF-IDF values for the terms in the TDM; and (ii) applying the Pareto principle (80:20) empirically for feature selection where the top 20% of the TF-IDF values are considered to be keywords describing 80% of the document.
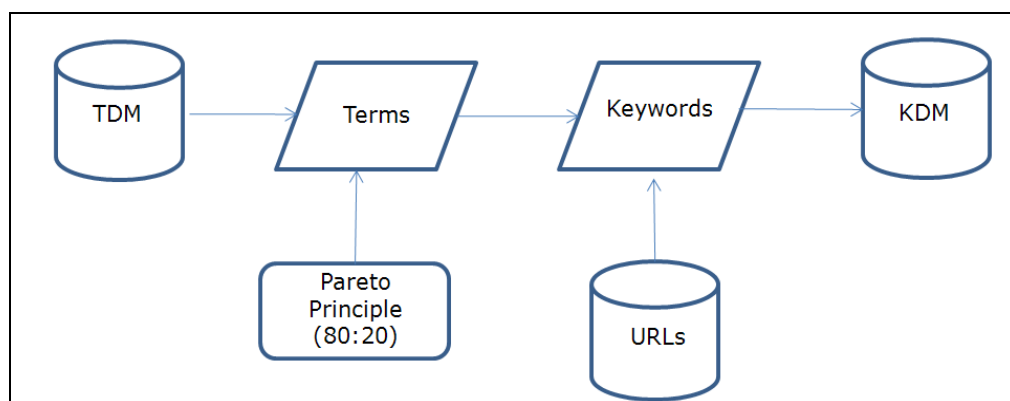
Figure 4. Formation of the KDM by normalizing the TF-IDF values of the terms in the TDM and applying the Pareto principle empirically for feature selection.

The OERScout user interface and algorithm are implemented using the Microsoft Visual Basic.NET 2010 (VB.NET, 2010) programming language. The corpus, list of terms, TDM, and KDM are implemented using the MySQL database platform. The OER resources are fed into the system using sitemaps based on extensible markup language (XML) which contain the uniform resource locators (URLs) of the resources. When implemented, new repositories will be identified for crawling based on referrals by end users. The sitemaps created by the crawlers will be input into the system to be processed. The server tools will continuously run at the server processing new documents and re-visiting processed documents to ensure accuracy. The KDM is accessed by end users through the OERScout Microsoft Windows based client interface. The deployment architecture of OERScout is shown in Figure 5.
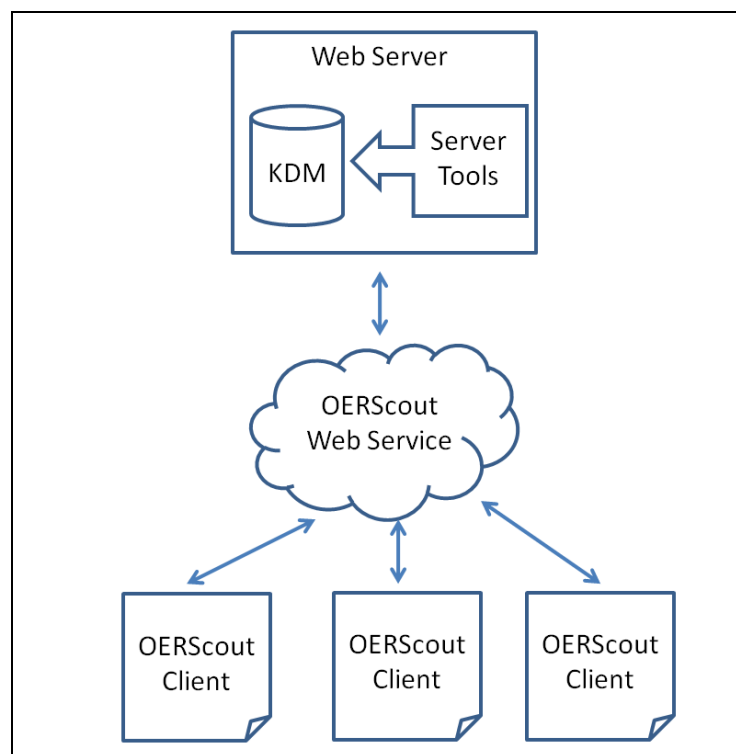
Figure 5. OERScout deployment architecture which has a web server hosting the KDM, a web service for accessing the KDM, and a Microsoft Windows based client interface.

Calculation of the Desirability

The desirability of OER (Abeywardena, Raviraja, & Tham, 2012) is a parametric measure of the usefulness of an OER for a particular academic need based on (i) level of openness, the permission to use and reuse the resource; (ii) level of access, the technical keys required to unlock the resource; and (iii) relevance, the level of match between the resource and the needs of the user. The desirability is calculated using Equation 2 and is denoted as the *D-index*, which is a value between 0 and 1. The higher the D-index, the more desirable an OER is for a particular academic need. The value 256 is used to normalise the access, openness, and relevance parameters. It is the product of the values

16, 4, and 4, respectively, which correspond to the highest value assigned to each parameter.

$$\text{D-index} = (\text{level of access x level of openness x relevance}) / 256 \quad (2)$$

The desirability of each document in the KDM is calculated using the openness, accessibility, and relevance of the document. As suggested by Abeywardena, Raviraja, and Tham (2012), the openness of the document is calculated using the Creative Commons (CC) license of the document (Table 1). A maximum value of 4 is assigned to the most open CC license with respect to permission to reuse, redistribute, revise, and remix (Hilton, Wiley, Stein, & Johnson, 2010). A value of 2 is assigned to the least open license as the CC license starts at the redistribute level.

The accessibility is calculated by extracting the file type of each document as shown in Table 2. This version of OERScout is built only to index documents of type PDF (.pdf), webpage (static and dynamic web pages which include .htm, .html, .jsp, . asp, .aspx, .php etc.), TEXT (.txt), and MS Word (.doc, .docx) as these file types were found to be the most commonly used for text based OER (Wiley, 2006). The value for each file type was calculated based on the ALMS analysis proposed by Hilton, Wiley, Stein, and Johnson (2010) which builds on the parameters (i) **A**ccess to editing tools; (ii) **L**evel of expertise required to revise or remix; (iii) ability to **M**eaningfully edit; and (iv) **S**ource-file access.

The relevance of a document to a particular search query is calculated using the TF-IDF values of the keywords which are stored as additional parameters of the KDM. As shown in Table 3, building on the work by Vaughan (2004), the top 10 search results based on the TF-IDF value are assigned a maximum value of 4, the top 11-20 search results are assigned a value of 3, the top 21-30 results are assigned a value of 2, and search results below 30 are assigned a minimum value of 1.

The D-index of each document is then calculated using Equation 2 and the desirable resources for a particular need are presented to the user in descending order.

Table 1

Openness Based on the CC License (Abeywardena, Raviraja, & Tham, 2012).

Permission	Creative Commons (CC) licence	Value
Reuse	None	1
Redistribute	Attribution-NonCommercial-NoDerivs (CC BY-NC-ND) Attribution-NoDerivs (CC BY-ND)	2
Revise	Attribution-NonCommercial-ShareAlike (CC BY-NC-SA) Attribution-ShareAlike (CC BY-SA)	3
Remix	Attribution-NonCommercial (CC BY-NC) Attribution (CC BY)	4

Table 2

Accessibility Based on the File Type (Abeywardena, Raviraja, & Tham, 2012)

File type	Access (ALMS)				
	A	L	M	S	Value
PDF	Low	High	No	No	1
MS Word	Low	Low	Yes	Yes	8
Webpage	High	Low	Yes	Yes	16
TEXT	High	Low	Yes	Yes	16

Table 3

The Level of Relevance Based on Search Rank

Search rank	Value
Below the top 30 ranks of the search results	1
Within the top 21-30 ranks of the search results	2
Within the top 11-20 ranks of the search results	3
Within the top 10 ranks of the search results	4

One of the key observations made during the calculation of the desirability is that certain OER repositories do not specify or use the CC licensing scheme as the standard for defining the intellectual property rights. However, these repositories explicitly or implicitly mention that the resources are freely and openly available for use and reuse. Due to the inability of the current OERScout system to determine the level of openness of these resources, a value of zero was assigned to any resource which did not implement the CC licensing scheme. As such the desirability of these resources was reduced to zero due to the ambiguity in the license definition. This feature spares the user from legal complications attached to the use and reuse of resources which do not clearly indicate the permissions granted.

Results

The application of the system in a real world scenario was done using the *Directory of Open Educational Resources* (DOER)[3] of the Commonwealth of Learning (COL). DOER is a fledgling *portal OER repository* (McGreal, 2010) which provides an easily navigable central catalogue of OER distributed globally. At present, the OER available through DOER are manually classified into 20 main categories and 1,158 sub-categories. However, despite covering most of the major subject categories, this particular ontology would need to expand by a large degree due to the variety of OER available in an array of subject areas. This expansion, in turn, becomes a tedious and laborious task which needs to be accomplished manually on an ongoing basis. As a possible solution to this issue, a mechanism was needed for autonomously identifying the subject area(s) covered in a particular OER, in the form of keywords, in order for it to be accurately catalogued.

Given this requirement, DOER was used as the training dataset for OERScout. In addition to the resources categorised in DOER, 1,536 resources from the Rice University's Connexions[4] repository were also included in the training dataset due to (i) the large number of OER materials available; and (ii) the relatively high popularity and usage rates. An XML sitemap containing a total of 1,999 URLs belonging to the domains of arts, business, humanities, mathematics, and statistics, science and technology, and social sciences was created as the initial input. The system was run with the initial input and was allowed to autonomously create the KDM. This training process was critical to the functioning of the algorithm as it had to learn a large number of academic domains and sub-domains before being able to accurately cluster resources according to the domain.

On average, each document required 15-90 minutes to be downloaded, read, and learnt by the system depending on the size and file type. The system took approximately five days to process all the documents in the training dataset. Although the training process required a considerable amount of time due to the lack of optimisation and enterprise scale infrastructure, this process takes place as a background operation at the server. Therefore, once the KDM is created, the end user does not experience any delays during the search process.

After completion of the run, the system had processed documents of various size, file types, and licenses from 11 repositories representing many regions of the world (Table 4). It was noted that there was a certain amount of noise in the keywords identified due to the limited number of resources indexed in a given domain. However, with more documents being indexed, the expansion of the list of terms will result in larger IDF values which will decrease the TF-IDF value for noise words. This will result in the algorithm rejecting these noise words as keywords, that is, the reduction of noise.

---

[3] http://doer.col.org/
[4] http://www.cnx.org

Table 4

Resources Indexed in the KDM Based on the Initial Input

	Repository	Host institution	Region	License	File type	No. resources indexed
1	Connexions	Rice University	USA	CC BY	Webpage	1536
2	OCW Athebasca	Athebasca University	Canada	CC BY	Webpage	07
3	OCW Capilano	Capilano University		CC BY-NC-SA	Webpage	19
4	OCW USQ	University of Southern Queensland	Australia	CC BY-NC-SA	Webpage	10
5	UCT Open Content	University of Cape Town	South Africa	CC BY-NC-SA	Webpage	63
6	OpenLearn	The Open University	UK	CC BY-NC-SA	Webpage	242
7	WikiEducator	COL & Ottago Polytechnic	New Zealand	CC BY-SA	Webpage	38
8	Unow	University of Nottingham	UK	CC BY-NC-SA	Webpage	27
9	TESSA	Multiple African Universities	Africa	CC BY-SA	PDF	15
10	OER AVU	African Virtual University	Africa	CC BY-SA	DOC DOCX PDF	40
11	WOU OER	Wawasan Open University	Malaysia	Various	PDF	02
	Total					1999

In order to test the functionality of the system from a real-world user's perspective, 27 academics who have at least 3-5 years of experience in OER advocacy, creation, use, and reuse were invited to test the system. Out of the 27 experts invited, 19, including six professors, five associate professors, three PhD holders, and four mid career academics, agreed to test the system and provide feedback. This group of users represented Australia, Brazil, Cambodia, Canada, China, Hong Kong SAR, Indonesia, Malaysia, Pakistan, and Vietnam. They comprised of varied backgrounds such as engineering, computer science, electronics, instructional design, distance education, agriculture,

biology, law, and library science. The KDM was made available to this group through the OERScout client interface shown in Figure 6.
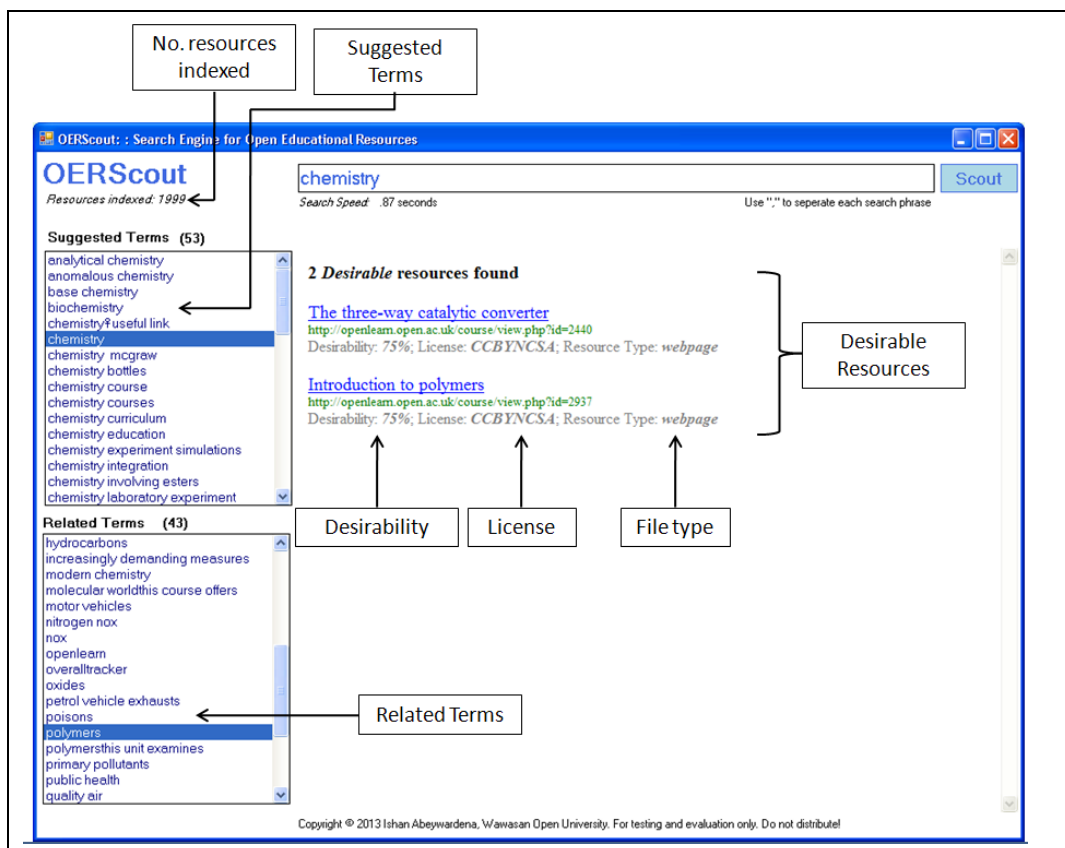
Figure 6. OERScout client interface used for testing the system. The figure shows a search result for resources on "chemistry: polymers".

A comprehensive user manual was provided to the users which outlined how OERScout searched for the most desirable resources. The testing was conducted for a duration of seven days. The users tested the system by searching for OER for their day-to-day academic needs. At the end of the test period, the users provided qualitative feedback through a web based feedback form on various aspects of the OERScout framework. The general feedback which holistically critiques the OERScout technology framework is consolidated in Table 5.

Table 5

Consolidated Feedback Gathered from the OERScout Test Users

	Criteria	Advantages of OERScout	Weaknesses of the prototype
1.	User interface	The user interface is quite simple, friendly, intuitive, un-cluttered and easy to operate. It avoids the hassle of shifting between search modes.	Add advanced search features such as year, language, author and type of resources are not available.
2.	"Faceted search" approach which allows users to dynamically generate search results based on suggested and related terms	The ability to drill down using "faceted search" is very useful. It helps to locate resources faster.	As the number of resources grows the list of suggested and related terms will be quite long. Some noise terms are generated along with the keywords.
3.	Ease of use	It is a powerful tool which allows users to easily locate relevant resources.	The number of resources indexed is quite small.
4.	Relevance of the suggested terms generated according to the search query	The suggested terms are quite relevant and covers the scope of the search adequately.	Some unfamiliar noise words were generated as suggested terms.
5.	Use of related terms to effectively zero in on the resources being searched for	The feature is very useful and performs well. The functionality is similar to a thesaurus used by librarians for cataloging.	Many different terms point to the same resource due to the small dataset. Some terms are not related to the domain. Too many terms are generated.
6.	Usefulness of the resources returned with respect to Openness (the ability to use, reuse, revise and remix)	The use of the CC license to locate the most open resources is a useful feature. The value of this feature will increase along with the increase of quantity and quality of OER available.	The licensing scheme needs to be indicated in a more user-friendly manner.
7.	Usefulness of the resources returned with respect to Access (the ease of reuse and remix of resource type)	The resources returned met the criteria of access with respect to use and reuse. Based on the resource type, users can immediately identify how they can use the resource.	This might not be important as the licensing type defines the reuse and remix capabilities.
8.	Usefulness of the resources returned with respect to Relevance (the match between the results and your query)	Currently quite accurate and very useful.	The small size of the dataset limits the relevance.
9.	Effectiveness with respect to identifying the academic domain(s) of a resource	The autonomous identification of academic domains increases the focus of the search and the quality of the resources returned.	The technology shows promise but the number of domains identified are limited due to the size of the dataset.
10.	Use of the desirability for filtering the most useful resources for ones needs	The desirability framework is an interesting idea which will help in identifying resources appropriate for specific needs.	The concept of desirability needs to be explained to the user through the interface.
11.	Effectiveness with respect to locating desirable resources in comparison to mainstream search engines or native search	A comparison between the OERScout and conventional search engines cannot be made as they serve different purposes. OERScout is	Search engines such as Google have large databases of indexed resources. In this sense they cannot be compared to OERScout.

	engines of OER repositories[a]	much more focused and addresses some key issues in OER search.	
12.	Innovativeness of the technology framework	The technology framework is quite innovative and can bridge the gap between different metadata standards. The simplicity of the user interface complements the scale of innovation.	The scope of the framework needs to be refined. The system needs to be made available as an online service.
13.	How the wider OER community will be benefited	The technology will benefit the wider OER community as a tool for thought provoking discussion on adopting and adapting resources. It will be very beneficial for the novice user with respect to ease of use and affordability.	At the moment it is only a prototype. More resources need to be indexed before it can benefit the community.

Discussion

Empirical Evidence

Figure 6 shows a search conducted for the term "chemistry" on OERScout based on the KDM. In contrast to the static list of search results produced by generic search engines, OERScout employs a "faceted search" (Tunkelang, 2009) approach by providing a dynamic list of *suggested terms* which are related to "chemistry". The user is then able to click on any of the suggested terms to access the most desirable OER from all the repositories indexed by OERScout. Furthermore, based on the selection by the user, the system will provide a list of *related terms* which will enable the user to drill down further to zero in on the most suitable OER for his/her teaching needs. In this particular example (Figure 6), the user has selected "polymers" as the related term to locate two desirable resources from the OpenLearn repository of The Open University which is known to host OER of high academic standard. Furthermore, Figure 7 shows the search results returned by OERScout for the search query on "calculus". The desirable resources returned are from the open course ware OCW Capilano of Canada, OpenLearn of UK, and OER AVU of Africa. As such, it can be seen that OERScout is a more focused and dynamic system for effectively searching for desirable OER. This becomes one of the major benefits to ODL practitioners as the system spares the user from conducting repeated keyword searches in OER repositories to identify suitable material for use. It also allows users to quickly zero in on OER suitable for their needs without reading through all the search results returned by a generic search mechanism such as Google. Table 6 summarises some of the key features of OERScout in contrast to the generic search engines Google, Yahoo!, and Bing.
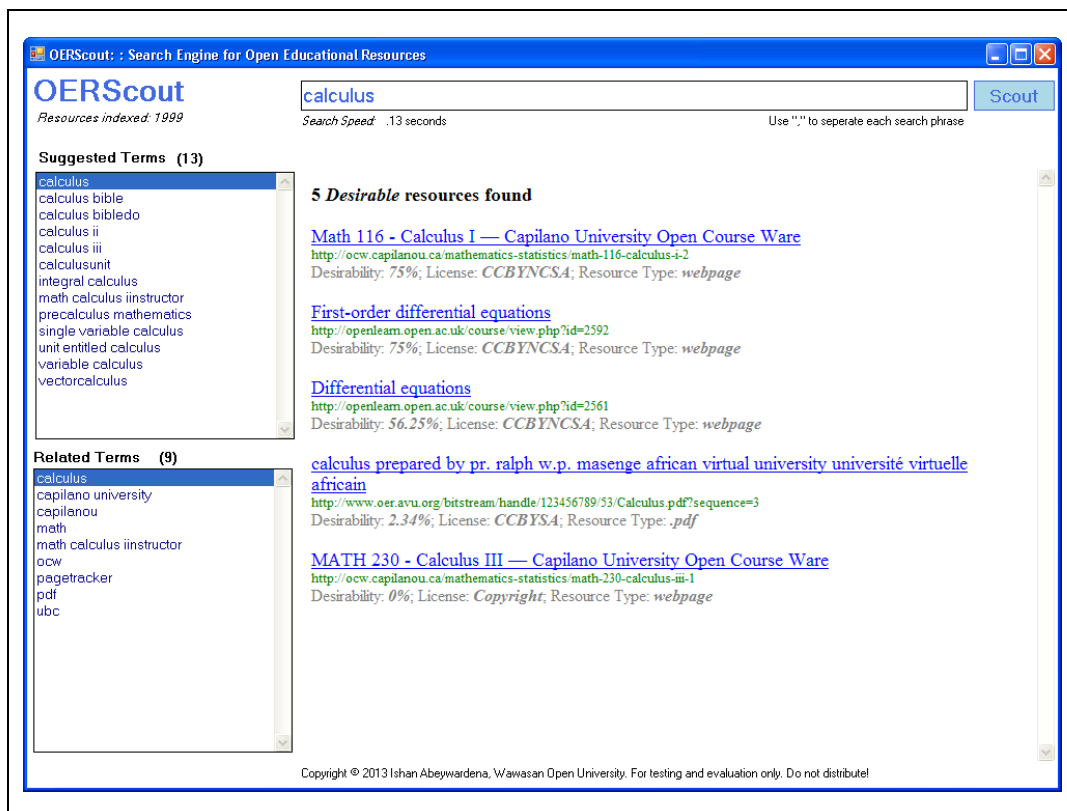
Figure 7. Search results generated by OERScout for the term "calculus". The desirable resources returned are from Capilano University, The Open University, and African Virtual University.

Table 6

Key Features of OERScout in Contrast to Google, Yahoo!, and Bing

	Key Feature	OERScout	Google	Yahoo!	Bing
1.	Provides a centralised mechanism to search for OER	Yes	Yes	No	No
2.	Searches for only the most *desirable* resources for academic purposes	Yes	No	No	No
3.	Effectively locates and presents resources from the distributed repositories	Yes	No	No	No
4.	Provides a dynamic mechanism instead of a static list of search results which can be used to zero in on the required resources	Yes	No	No	No
5.	Uses autonomously identified keywords for locating the most relevant resources	Yes	No	No	No
6.	Uniformly annotates resources with the relevant keywords to facilitate accurate searching	Yes	No	No	No
7.	Removes human error in the annotation of keywords	Yes	No	No	No

User Feedback

Based on the expert user feedback summarised in Table 5, the key strengths of the system include the ease of use, the specific focus on OER, the ability to quickly zero in on the required resource, and the use of desirability in the identification of the resource. The ability to autonomously identify academic domains and locate resources from heterogenous repositories regardless of the metadata standard are also found to be strengths of the system. The users felt that OERScout will especially benefit academics who are novices to OER.

One of the major weaknesses of the current prototype version was the limited number of resources indexed. This contributes to noise in the identified keywords and results in long lists of suggested and related terms. However, as the number of resources indexed grows, the noise words will be reduced giving way to more focused suggested and related terms. The users also felt that more advanced filters need to be added onto the search interface to allow filtering of properties such as file types and licences. However, the fundamental concept behind the desirability framework is to parametrically identify the most useful resources without the user's intervention. This observation suggests that a change in mindset with respect to search engines needs to take place before users can get accustomed to OERScout. The users also felt that the licensing scheme needs to be explained in non technical terms such as "can reuse, redistribute, revise and remix even commercially" instead of "CCBY". They further suggested that the calculation of the desirability be explained to the user.

The technology framework used was also found to be a limitation of the system. The current Microsoft Windows based client interface limits the users to Microsoft PC consumers. However, the real world implementation of the system will be done on a web based platform which will provide wider access regardless of device or operating system. Another limitation is that this version of OERScout is not designed to cluster non-text based materials such as audio, video, and animations which is a drawback considering the growing number of multimedia based OER. However, it is noted from the initial results that the system will accurately index multimedia based material using the textual descriptions provided. One more design limitation is its inability to cluster resources written in languages other than English. Despite this current limitation, the OERScout algorithm has a level of abstraction which allows it to be customised to suit other languages in the future.

Considering the opportunities, the system was found to be thought provoking with respect to finding, adopting, and adapting OER. It also appeals to the novice OER users in terms of training, affordability, teaching, and learning. This in turn will promote further research and development in the field of OER. Analysing the threats, one of the major threats to OERScout is the scale of the resource databases available to mainstream search engines such as Google. In this respect, the users felt that OERScout will be unable to compete with these search engines. However, the users also felt that OERScout addresses a few focused issues related to OER and need not be compared to mainstream search engines which are more general in nature. It is also worth noting

that the system will need to continuously update its resource database to ensure accuracy. Among the threats identified, the change in mindset with respect to this new search approach remains the greatest challenge to overcome.

Based on the above discussion, we strongly feel that the OERScout technology framework addresses the key deficiencies with respect to OER search. In sum, the provision of a centralised system which allows academics to effectively zero in on desirable resources hidden away in heterogenous repositories makes OERScout a viable alternative to existing OER search methodologies.

Conclusion

With more and more OER repositories mushrooming across the globe and with the expansion of existing repositories due to increased contributions, the task of searching for useful OER has become a daunting one. As discussed in the literature, a compounding factor to this current predicament is the inability of present day OER search methodologies to effectively locate resources which are desirable in terms of openness, access, and relevance. As a potential solution to this issue we propose the OERScout technology framework.

OERScout uses text mining techniques to cluster OER using autonomously mined domain specific keywords. It is developed with a view of providing OER creators and users a centralised system which will enable effective searching of desirable OER for academic use. The benefits of OERScout to content creators include (i) elimination of the need for manually annotating resources with metadata used in search; (ii) elimination of the need for publicising the availability of a repository and the need for native search mechanisms; and (iii) reach of material to a wider audience. The system benefits OER users by (i) providing a central location for finding resources of acceptable academic standard; (ii) locating only the most desirable resources for a particular teaching and learning need; and (iii) allowing the user to effectively zero in on the resources they are after. Based on the initial expert user test results, OERScout shows promise as a viable solution to the global OER search dilemma.The ultimate benefit of OERScout is that both content creators and users will only need to concentrate on the actual content and not the process of searching for desirable OER.

It is our intention to make OERScout available as a public service via www.oerscout.org which would allow academics to search desirable OER for their specific teaching and learning needs. We also intend to transfer the system onto a free and open source software (FOSS) platform in the spirit of openness and accessibility. Considering the limitation of the current system with respect to searching resources written in languages other than English, we are currently designing a further extension to OERScout which will facilitate searching of resources written in other languages. Furthermore, we are exploring the possibility of autonomously extracting some important IEEE LOM metadata from OER to provide better recommendations.

Acknowledgements

References

Abeywardena, I. S. (2013). Development of OER-based undergraduate technology course material: "TCC242/05 web database application" delivered using ODL at Wawasan Open University. In G. Dhanarajan & D. Porter (Eds.), *Open educational resources: An Asian perspective* (pp. 173-184). Vancouver: Commonwealth of Learning and OER Asia.

Abeywardena, I. S., Dhanarajan, G., & Chan, C. (2012). Searching and locating OER: Barriers to the wider adoption of OER for teaching in Asia. *Proceedings of the Regional Symposium on Open Educational Resources: An Asian Perspective on Policies and Practice.* Penang, Malaysia.

Abeywardena, I. S., Raviraja, R., & Tham, C. Y. (2012). Conceptual framework for parametrically measuring the desirability of open educational resources using D-index. *International Review of Research in Open and Distance Learning , 13*(2), 104-121.

Anido, L. E., Fernández, M. J., Caeiro, M., Santos, J. M., Rodriguez, J. S., & Llamas, M. (2002). Educational metadata and brokerage for learning resources. *Computers & Education , 38*(4), 351-374.

Balaji, V., Bhatia, M. B., Kumar, R., Neelam, L. K., Panja, S., Prabhakar, T. V., et al. (2010). Agrotags–a tagging scheme for agricultural digital objects. *In Metadata and Semantic Research* (pp. 36-45). Berlin Heidelberg: Springer.

Barton, J., Currier, S., & Hey, J. (2003). Building quality assurance into metadata creation: An analysis based on the learning objects and e-prints communities of practice. *In 2003 Dublin Core Conference: Supporting Communities of Discourse and Practice - Metadata Research and Applications.* Seattle, Washington.

Brooks, C., & McCalla, G. (2006). Towards flexible learning object metadata. *International Journal of Continuing Engineering Education and Life Long Learning , 16*(1), 50-63.

Calverley, G., & Shephard, K. (2003). Assisting the uptake of on-line resources: Why good learning resources are not enough. *Computers & Education , 41*(3), 205-224.

Casali, A., Deco, C., Romano, A., & Tomé, G. (2013). An assistant for loading learning object metadata: An ontology based approach. *Interdisciplinary Journal of E-Learning and Learning Objects (IJELLO), 9*, 11.

Caswell, T., Henson, S., Jenson, M., & Wiley, D. (2008). Open educational resources: Enabling universal education. *International Review of Research in Open and Distance Learning , 9*(1), 1-11.

Cechinel, C., Sánchez-Alonso, S., & Sicilia, M. Á. (2009). Empirical analysis of errors on human-generated learning objects metadata. In *Metadata and Semantic Research* (pp. 60-70). Berlin Heidelberg: Springer.

De la Prieta, F., Gil, A., Rodríguez, S., & Martín, B. (2011). BRENHET2, A MAS to facilitate the reutilization of LOs through federated search. *In Trends in Practical Applications of Agents and Multiagent Systems* (pp. 177-184). Berlin Heidelberg: Springer.

Devedzic, V., Jovanovic, J., & Gasevic, D. (2007). The pragmatics of current e-learning standards. *Internet Computing, 11*(3), 19-27.

Dhanarajan, G., & Abeywardena, I. (2013). Higher education and open educational resources in Asia: An overview. In G. Dhanarajan & D. Porter (Eds.), *Open educational resources: An Asian perspective* (pp. 3-10). Vancouver: Commonwealth of Learning and OER Asia.

Dichev, C., & Dicheva, D. (2012). Open educational resources in computer science teaching. *Proceedings of the 43rd ACM technical symposium on Computer Science Education* (pp. 619-624). ACM.

Feldman, R., & Sanger, J. (2006). *The text mining handbook: Advanced approaches in analyzing unstructured data.* Cambridge University Press.

Ha, K. H., Niemann, K., Schwertel, U., Holtkamp, P., Pirkkalainen, H., Boerner, D., et al. (2011). A novel approach towards skill-based search and services of open educational resources. *Proceedings of Metadata and Semantic Research* (pp. 312-323). Berlin Heidelberg: Springer.

Hilton, J., Wiley, D., Stein, J., & Johnson, A. (2010). The four R's of openness and ALMS Analysis: Frameworks for open educational resources. *Open Learning: The Journal of Open and Distance Learning,25* (1), 37-44.

Kolowich, S. (2012, November 5). *Pearson's open book.* Retrieved from http://www.insidehighered.com/news/2012/11/05/pearson-unveils-oer-search-engine

Lextek. (n.d.). *Onix Text Retrieval Toolkit API reference.* Retrieved from lextek.com: lextek.com/manuals/onix/stopwords1.html

McGreal, R. (2010). Open educational resource repositories: An analysis. *Proceedings of the 3rd Annual Forum on e-Learning Excellence.* Dubai, UAE.

Piedra, N., Chicaiza, J., López, J., Martínez, O., & Caro, E. T. (2010). An approach for description of open educational resources based on semantic technologies. *In Education Engineering (EDUCON)* (pp. 1111-1119). IEEE.

Piedra, N., Chicaiza, J., López, J., Tovar, E., & Martinez, O. (2011). Finding OERs with social-semantic search. *Proceedings of the 2011 IEEE Global Engineering Education Conference (EDUCON)* (pp. 1195-1200). Amman, Jordan: IEEE.

Pirkkalainen, H., & Pawlowski, J. (2010). Open educational resources and social software in global e-learning settings. In P. Yliluoma (Ed.), *Sosiaalinen verkko-oppiminen* (pp. 23-40). Naantali: IMDL.

Shelton, B. E., Duffin, J., Wang, Y., & Ball, J. (2010). Linking opencoursewares and open education resources: Creating an effective search and recommendation system. *Procedia Computer Science, 1*(2), 2865-2870.

Tello, J. (2007). Estudio exploratorio de defectos en registros de meta-datos IEEE LOM de objetos de aprendizaje. *In Post-Proceedings of SPDECE 2007 - IV Simposio Pluridisciplinar sobre Diseno, Evaluacion y Desarrollo de Contenidos Educativos Reutilizables* (pp. 19-21). Bilbao, Spain.

Tunkelang, D. (2009). Faceted search. In G. Marchionini (Ed.), *Synthesis lectures on information concepts, retrieval, and services* (Vol. 5, pp. 1-80). Morgan & Claypool.

UNESCO. (2012, June 22). *2012 PARIS OER Declaration.* Retrieved from unesco.org: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/WPFD2009/English_Declaration.html

Unwin, T. (2005). Towards a framework for the use of ICT in teacher training in Africa. *Open Learning: The Journal of Open, Distance and e-Learning, 20*(2), 113-129.

Vaughan, L. (2004). New measurements for search engine evaluation proposed and tested. *Information Processing and Management, 40*, 677-691.

West, P., & Victor, L. (2011). *Background and action paper on OER.* Report prepared for The William and Flora Hewlett Foundation.

Wiley, D. (2006). *On the sustainability of open educational resource initiatives in higher education.* Retrieved from oecd.org:http://www1.oecd.org/edu/ceri/38645447.pdf

Yamada, T. (2013). Open educational resources in Japan. In G. Dhanarajan & D. Porter (Eds.), *Open educational resources: An Asian perspective* (pp. 85-105). Vancouver: Commonwealth of Learning and OER Asia.

Yergler, N. R. (2010). Search and ciscovery: OER's open loop. *Proceedings of Open Ed 2010.* Barcelona.

Athabasca University

Power Distance in Online Learning: Experience of Chinese Learners in U.S. Higher Education
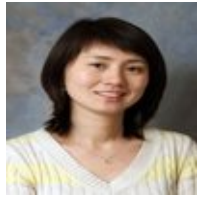
Yi (Leaf) Zhang
University of Texas at Arlington, USA

Abstract

The purpose of this research study was to explore the influence of Confucian-heritage culture on Chinese learners' online learning and engagement in online discussion in U.S. higher education. More specifically, this research studied Chinese learners' perceptions of power distance and its impact on their interactions with instructors and peers in an online setting. This study was conducted at a research university in the southwestern U.S. Twelve undergraduate students from the Confucian-heritage culture, including mainland China, Taiwan, and Hong Kong, participated in the study. This study provided evidence that the online setting benefited these Chinese learners' engagement in class discussion, but it may increase the level of anxiety in their participation. Learning, perceived by the Chinese learners, was more instructor-centered. Instructors were viewed by students as authorities, major sources of knowledge, and possessing high power. As a result, when encountering difficulties in learning, the Chinese learners were intimidated to interact with their instructors. Instead, they tended to seek help from peers, particularly those who shared similar cultural and linguistic backgrounds.

Keywords: Online learning; Chinese learners; power distance

Introduction

Distance education, particularly online learning, has become more popular and accessible in U.S. higher education as it marches into the arena of borderless education. Online education enables students to access a wider range of educational resources, to pace their own learning process, and to collaborate with others from different cultures and linguistic backgrounds (McLoughlin, 1999; Thompson & Ku, 2005). Online learning relies heavily on advanced computer and internet technologies. While online education brings significant benefits to students, it may lead many to struggle with technical aspects of online courses (Bol & Garner, 2011; Moore & Kearsley, 2011). Students taking online courses must be able to effectively use technology, work in virtual teams, pace themselves in completing assignments, and engage with peers and faculty (Richardson & Swan, 2003).

As international student enrollment in the U.S. reached another record high in the 2010-11 academic year (IIE, 2012), online learning that engages a global audience increasingly catches researchers' attention for further investigation from cross-cultural perspectives. It has been noted that technology can amplify the cultural dimensions of communication (McLoughlin & Oliver, 2000) and that instructional materials designed from a dominant culture could be challenging for learners from other cultures (Wild & Henderson, 1997). It is not surprising that international students in the U.S. experience technical challenges as well as the obstacles of cultural differences.

This study took a "Chinese learner" perspective due to the fast growth and large number of the Chinese student population in U.S. higher education (IIE, 2012). The term *Chinese learner* was coined by Watkins and Biggs (1996) and defined by Rao and Chan (2009) as

> Chinese students in Confucian-heritage culture classrooms who are influenced by Chinese belief systems, and particularly by Confucian values that emphasize academic achievement, diligence in academic pursuits, the belief that all children regardless of innate ability can do well through the exertion of effort, and the significance of education for personal improvement and moral self-cultivation. (p. 4)

Chinese learners can be found in different geographical locations and political systems, such as mainland China, Hong Kong, Taiwan, and Singapore (Watkins & Biggs, 1996). Compared to U.S. students and students from other cultures, Chinese learners may engage in online learning at different levels and exhibit different communication patterns. This study explored how students' cultural backgrounds affect their perception of online learning and engagement in online discussion. More specifically, this research studied Chinese learners' perceptions of power distance and its impact on their interactions with instructors and peers in an online setting.

Literature Review

Chinese Learners

A body of literature that focuses on Chinese learners suggests that Chinese learners are significantly different from their Western counterparts. However, these studies have a tendency to define the difference as deviation from Western norms and to imply that Chinese learners are less adequate in a Western learning environment. For instance, early studies (e.g., Ballard & Clanchy, 1991; Carson, 1992; Carson & Nelson, 1996; Dunbar, 1998; Flowerdew, 1998; Samuelowicz, 1987) portrayed negative pictures of students from Confucian-heritage culture as passive learners, reliant on simplistic rote memorization, assessment-driven, obedient to authority, with little interest in critical thinking, and fearful of showing different opinions to the instructor.

It is often believed that the Confucian-heritage culture contributed to these "negative" learning characteristics of Chinese learners. Murphy (1987) suggested that the Confucian ethic of *filial piety* can explain why Hong Kong students tend not to question the knowledge of their teachers. Bond (1992) agreed with Murphy that Confucian values require people to have respect for age and rank, such as parents, teachers, and seniors. Another factor in Confucian-heritage culture that greatly impacts students' learning is the concept of "face" (Bond, 1996). "Having face" means that one has status in front of others. It is not surprising that Chinese learners are hesitant to question or criticize their teachers and peers, for the fear of "losing face" or causing others' to lose face (Bond, 1996).

Some researchers argue that Chinese learners and their learning approaches have been misinterpreted by Western scholars and researchers. As an important source of research on Chinese learners, Biggs (1996, 1998) studied Hong Kong students and provided a less stereotypical description of Chinese learners. He believed repetition was a way of understanding, instead of simply rote learning. He also found although instructors were viewed as authorities they were constructivist educators and believed in student-centered education. Biggs indicated that these learning behaviors can be applied to other learning environments, which explains why many Chinese learners are successful in Western education systems and outperform their Western peers. Volet and Renshaw (1996) obtained similar findings from their study that investigated Singaporean Chinese students in Australian universities. They found that these students were highly responsive to the new learning environment and greatly motivated to achieve success in academic studies. Chan (1999) held a positive view towards Chinese learners as well. He found that Chinese learners value active and reflective thinking, open mindedness, and a spirit of inquiry. Jones (2005) found a considerable level of similarity in the understanding of critical thinking between Asian and Australian college students in macroeconomics. He acknowledged the differences between Asian and Western learners in their learning approaches, but claimed that the Confucian heritage culture does not

need to be viewed as a deficit in a Western setting.

Online Education

Distance education has become an indispensable component in today's higher education. With the development of technology, distance learning enables students to learn at their own pace, to have broader access to information, and to engage in learning with students from different cultures (Appana, 2008; Harasim, 2000; Kim, Liu, & Bonk, 2005). Interactions that occur in online settings differ from face-to-face discussions. Most of the online interactions, including learner-to-instructor, learner-to-learner, and learner-to-content, are asynchronous, which may reduce the extent of communication, delay replies, and require additional time and effort in preparing responses (Anderson, 2004; Curtis & Lawson, 2001). It was found that this feature could bring both advantages and disadvantages for students' learning.

Gunawardena, Wilson, and Nolla (2003) claimed that the online medium is beneficial for students' learning because it frees students from the bonds of physical appearances. Particularly for students whose first language is not English, the online environment provides them with more privacy and extra time to respond to class discussion (Yi & Majima, 1993). Beamer and Varner (2008) indicated that international students felt more comfortable to express their own opinions in the online setting when compared to face-to-face classrooms. Yildez and Bichelmeyer (2003) studied non-English speakers in face-to-face and virtual classrooms, including Confucian-heritage culture students from Taiwan. They reported that international students actually participated more in the online discussion because the online environment focused less on simultaneous responses, which require higher competencies in listening, speaking, and making comments on the spot. In fact, online classrooms provided students with more time to read and prepare their posts. Gerbic (2006) claimed that Chinese students preferred online discussion rather than face-to-face classes because they had better control of the pace of discussion and were more confident in expressing their opinions.

Other researchers noted that Chinese and other Asian students encountered more difficulties in learning online in a Western setting when compared to domestic students. Focusing on Chinese graduate students in the U.S., Tu (2001) argued that the influence of Confucian-heritage culture hindered Chinese students from participating in online discussion and minimized their learning experiences. Pan, Tsai, Tsai, Tao, and Cornell (2003) obtained similar findings. They indicated that Asian students (mostly from Confucian-heritage culture) were reluctant to participate in online discussions. Smith, Coldwell, Smith, and Murphy (2005) conducted a comparative study exploring student online learning behavior between Chinese and Australian students at an Australian university. They found that although these two groups of students demonstrated similar attitudes towards self-managed learning, the Chinese cohort was less comfortable with online learning, more reluctant to communicate with others, and contributed fewer online messages to class discussions. Chen, Bennett, and Maton (2008) studied the adaptation experiences of Chinese international students in Australia. Their study found

that Chinese learners needed more teacher control and interpersonal relationships. It concluded that the text-based communication medium did not enhance class participation for the Chinese students.

Conceptual Framework

Cultural attributes can affect learners' perceptions, expectations, and experiences. Hofstede (2001) defined culture as "the collective programming of the mind that distinguishes the members of one group or category of people from another" (p. 9) and identified five dimensions of culture: power distance, uncertainty avoidance, individualism versus collectivism, masculinity versus femininity, and long-term versus short-term orientation. These dimensions were created to measure the influence of a person's national culture on his or her individual values. The term power distance was first coined by Mulder, a Dutch social psychologist who studied interpersonal power dynamics in the 1960s (Hofstede, 2001, p. 79). Power distance deals with human inequality, which refers to how people in a hierarchical society respond to other individuals who hold positions that are superior or inferior to their own (Hofstede, 2001). In high power distance cultures (e.g., Confucian-heritage culture), people are more likely to accept a hierarchical structure and demonstrate greater respect for position, age, and/or authority than do those in low power distance cultures. This study particularly focused on how Chinese learners' perceptions of power distance impacted their online learning experiences. The dimension of power distance was chosen because, among all of the five dimensions, power distance was reported to have a greater influence on students' learning (Selinger, 2004).

Hofstede (2001) compared Asian and American cultures and indicated the former has a greater power distance and stronger uncertainty avoidance, while the latter has a smaller power distance and weaker uncertainty avoidance. Thus, in an online learning setting in the U.S., Chinese learners have to overcome not only challenges that online education brings, but also differences in cultural distance (Wilson, 2001). This study investigated Chinese learners' perceptions of power distance and its impact on their online learning experiences in the U.S., particularly their interactions with the instructor and other students.

Research Methodology

Setting and Participants

This study was conducted at a research university in the southwestern U.S. Twelve undergraduate students participated in the study. All of the students were from the Confucian-heritage culture, including mainland China, Taiwan, and Hong Kong. They were purposefully chosen to ensure that they were qualified to provide necessary

perspectives (Creswell, 2009). These participants were from eight different majors, and the length of time they had studied at the university varied from eight months to almost four years. Seven of the participants were female. To protect identification and ensure anonymity, each participant was assigned an English pseudonym.

For the purpose of this study, online courses were defined as "those in which at least 80 percent of the course content is delivered online" (Allen & Seaman, 2006, p. 4). Among all of the participants, Alice had experienced the least online learning as she was taking her first online class when she was interviewed. The other participants had taken a minimum of two and maximum of four online courses in the U.S. Participant characteristics are described in Table 1.

Table 1

The Participants' Characteristics

Participants (Pseudonym)	Gender	Major	Home origin	First enrolled in the university	No. of online courses
Alice	F	Accounting	Mainland China	Fall 2012	1
Ben	M	Industrial engineering	Mainland China	Spring 2011	2
Cathay	F	TESOL	Hong Kong	Fall 2011	2
David	M	Computer science & engineering	Taiwan	Fall 2010	4
Eva	F	Accounting	Taiwan	Fall 2010	3
Frankie	M	Marketing	Hong Kong	Spring 2009	2
Gloria	F	Mathematics	Mainland China	Fall 2009	3
Heather	F	Electrical engineering	Taiwan	Fall 2009	2
Iris	F	Computer science & engineering	Mainland China	Fall 2010	2
Jack	M	Marketing	Mainland China	Fall 2012	2
Kim	F	Psychology	Hong Kong	Fall 2010	2
Larry	M	Electrical engineering	Taiwan	Fall 2011	2

Data Collection and Analysis

Data were collected from face-to-face individual interviews with the participants. Prior to the data collection, two pilot interviews were conducted to test the interview protocols. At the end of the pilot interviews, the researcher revised the interview questions according to the interviewee's comments. On average, the interviews lasted 30 to 50 minutes. The interviews were semi-structured, which allows the researcher to

explore new information that emerged from conversation with the participants (Creswell, 2009). The interview questions were designed to explore the Chinese learners' experiences with online education in the U.S. and focused particularly on their interactions with instructors and peers.

Interviews were conducted in both mandarin Chinese and English. The participants were allowed to choose to use either language during the interview. Except for two (Cathay and Kim), all of the interviews were conducted primarily in mandarin Chinese. Most of the students shared their stories in Chinese but responded in English when it came to academic-related terms, such as syllabus, projects, and Blackboard Learn. All interviews were audio recorded and transcribed verbatim into text in the language that the respondents chose. Member checking was performed to allow the participants to review their responses to the interview questions. In so doing, the participants had opportunities to revise or to add new information (Lincoln & Guba, 1985). Chinese transcripts were translated into English for further analysis. The transcripts were first open coded through a first review to identify initial topics and categories. Thematic findings were created by making comparisons and connections between categories (Esterberg, 2002).

The Researcher's Role

The role of the researcher as the primary data collection instrument should not be neglected and his or her personal values should be identified in qualitative studies (Creswell, 2009). As a former international student from mainland China and one who took several online courses in the setting of U.S. higher education, I bring my own understanding of both Confucian-heritage culture and experiences of online learning as an English as a second language learner to this study. My background made it easier to communicate with the participants at the interviews because of our shared experiences and perspectives. However, my previous experiences may shape the way I understand participants' experiences and the way I interpret the data collected from the interviews. This may lead to certain biases, although every effort was made to ensure objectivity.

Limitations

This study took a qualitative approach and focused primarily on students at a research university in the southwestern U.S. The findings of the study are not expected to be generalized to other settings. Although this study focused on Chinese learners who share Confucian-heritage culture in common, the researcher acknowledged that this is not a homogeneous group and there is substantial within-group variation, including country of origin, age, gender, socio-economic status, educational experiences, and parental influences.

Findings

Through face-to-face interviews with 12 participants, the researcher found evidence that students' perceptions of power distance impacted their expectation of online learning, participation in class discussion, and interactions with others in the online setting. Four themes emerged from the analysis and are presented with supporting quotes, including engagement in online discussion, lack of instructors' participation, avoidance of offensiveness and conflicts, and online learning community and support.

Engagement in Online Discussion

Eleven out of 12 participants reported that the asynchronous feature of online learning had been helpful for them to participate in class discussions. This feature gave students time to consider answers, conduct research, and edit their responses. Many participants, particularly those who are experienced in expressing ideas in English, found it easier to respond to discussions in writing than speaking. Ben shared,

> I felt more confident participating in online discussion because I can take as much time as I need. In the online discussion, I do not need to worry about if I have any accent, if I fully understand the question, or if I remember all the terms. Writing is not easy, but I have more time to prepare.

Iris appreciated the delayed communication in the online learning environment as well. She shared similar experiences: "In online classes, I can read and reread the others' posts and when I respond, I am not under pressure that I have to come up with an answer within a minute."

Nine participants enjoyed online discussion because they were more involved in the process. The Chinese learners felt it was easier to voice their opinions in online discussions. As they indicated, the online setting provides equal opportunities for each student to participate. Frankie compared his experience in both online and face-to-face classes and felt more comfortable in online discussion.

> I felt less stress to present my thoughts in an online setting.... I found it very challenging to jump into a discussion in a face-to-face classroom. Some of my classmates can continue talking for a long time and I do not know how to stop them without being rude.

Having studied in a bilingual environment for 12 years in Hong Kong, Cathay came to the U.S. with an excellent TOEFL score and English has become like her native language. Cathay concurred with Frankie although she experienced no linguistic barriers.

> I was taught that I should not start talking until others

finish talking. However, I found often that I was left out in class discussions in a face-to-face setting.... In online discussions, I have no problems at all expressing my own thoughts and responding to the others. I do not have to fight for opportunities to speak up.

Lack of Instructors' Participation

Although most of the participants enjoyed online discussion, eight felt lost when instructors were not involved or not providing guidance in the discussion. Several students reported a high expectation on instructors' participation in online discussion and demanded immediate feedback from them. Gloria indicated that she had limited gains from class discussions in an online course due to the lack of presence of her instructor.

I did not feel I learned much from online discussions. My instructor basically provided a question for discussion at the end of each class and asked us to post our thoughts and respond to the others' posts. However, she did not tell us who had better responses, which posts made mistakes, or what we should do to make improvement.

Iris expressed similar frustration. She shared with the researcher that she enjoyed reading the posts of her classmates in online discussions, but learning for her was beyond that. It involved more instructor guidance and participation. She valued the knowledge from her instructor more than from the students.

I missed talking with instructors like in the face-to-face classes. If the discussions were in a traditional classroom, you could always hear from the professor and know what he/she thought about the students' inputs.

Avoidance of Offensiveness and Conflicts

Almost all of the participants expressed concerns of contacting instructors when they have questions regarding class assignments and course materials. Different from face-to-face classes, students in an online setting primarily communicate with their instructors via email or postings on the Internet. The participants worried that their expression may cause misunderstanding or their choice of words may accidentally offend their instructors.

Alice, who was taking her first online course ever in the U.S., shared her anxiety.

It always takes me a long time to draft an email to my instructor. I am afraid that I do not sound polite enough in the email...I am less concerned about this [offending

> my instructor in an email] in face-to-face classes, because I feel the instructors have a better understanding about who I am. But in the online class, I am only judged by how I wrote. I don't want to offend my instructor by any chance.

Similar concerns were reported by many respondents when they were participating in online class discussions. These Chinese learners felt either reluctant to express their own opinions or intimidated to make mistakes in their posts online. Several students referred to their online postings as "permanent records." As Kim indicated, "I don't want to make any mistakes or say anything stupid... my comments will be posted in the discussion forum for the entire semester."

When a conflict or controversial topics were presented in the online discussion, many of the Chinese learners chose to "stick with the acceptable answers" and tended to stay away from the heated debate. Ben indicated when there was a controversial discussion he usually chose to post natural comments. He felt "it was pointless to get things more complicated and make others upset." Cathay indicated disagreeing might be offensive to the others.

> It could be offensive if you disagree with someone on their own experiences, cultures, or traditions. Rather than saying "you are wrong," there are many better ways to present a different idea.... It is especially important to online discussions because our body languages are not seen.

Online Learning Community and Support

The participants viewed instructors as important sources of knowledge and valued their teaching and sharing. However, they felt more comfortable to turn to peers when they were facing difficulties. The participants indicated that communicating with peers was less intimidating compared to the instructors. Heather found her classmates were responsive when she posted her questions in a discussion forum.

> I had some questions regarding an assignment and I decided to try posting them in the [online] discussion forum...to see if anyone will help me.... I actually received responses from several classmates and the fastest one responded to me in less than five minutes.

The participants valued sharing between themselves and their classmates. For some, this was a process of self-validation. Kim found it helpful when she talked with her classmates who had the same question.

> I was anxious at first because I thought I was the only

> one in my class had such a stupid question.... After I
> shared my concerns with another student I realized that
> there were a couple of other students in my class
> wondered about the same thing. We then got together
> and found a solution.... Knowing you are not alone is
> encouraging.

When searching for help, the participants particularly favored peers from similar cultural and linguistic backgrounds. They also tended to form groups with those they felt more connected with. Eva was very excited when she found out two of her classmates in an online course were from her hometown in Taiwan.

> We three always got together to discuss our homework.
> If we have any questions, we checked with each other
> first before we contacted our professor. It helped that we
> all spoke the same language, but sharing the same
> culture helped more.

Discussion

Interviews with 12 international students from the Confucian-heritage culture revealed how Chinese learners interact with instructors and peers and how they perceive their learning experiences in an online setting. The findings of this study also uncovered the impact of power distance on Chinese learners' online academic experiences in the U.S.

Perceptions of Instructors

Confirming existing findings of power distance, the Chinese learners demonstrated a strong power distance in the online setting. The participants viewed instructors as a significant source of knowledge and showed greater respect to them. Similar to the findings of McMahon's (2011) study on Chinese students in U.K. higher education, this study found that the Chinese learners perceived professors as authority figures who are supposed to play a dominant role in class discussion. The students expected to receive guidance from the instructors in online discussion. Thus, reading other classmates' posts and discussing topics with peers were viewed as less significant than instructor-led learning activities. Indeed, many participants expressed concerns when instructors' involvement in online discussion was lacking, thus devaluing their entire online learning experience. This echoed Peters' (1998) finding that Asian students were usually other-ruled rather than autonomous learners.

The findings of this study also indicated that students from the Confucian-heritage culture might be unaccustomed to the online model of learning in the U.S. The Chinese learners can be led towards greater autonomous learning if instructors provide them with explicit explanations and expectations for the class (Kennedy, 2002). The

instructors can also utilize multiple media to engage Chinese learners in class discussion.

Online Interactions

As discussed above, these Chinese learners believed that instructors played an authoritarian role in learning. Accordingly, the participants demonstrated a strong tendency to avoid approaching instructors when they had questions about course materials or assignment requirements. When they had to write to their instructors, the students spent a considerable amount of time on editing and grammar checking. The students were especially concerned whether their writing displayed a polite manner. For instance, Gloria spent hours drafting an email to the instructor to ensure that it read politely enough. As Liu (2001) argued, the way Chinese learners interact with their instructors is usually impacted by "the socio-cultural factors combined with linguistic and affective factors" (p. 176).

These findings suggest that the Chinese learners viewed their classes as hierarchical structures and considered instructors as superiors in the structure. Instructors in U.S. higher education may need to take additional efforts to approach the Chinese students in order to decrease the distance between themselves and the students. In so doing, the Chinese learners could be better engaged in online discussion and other learning activities.

Communication with instructors was viewed as a formal activity, while interaction with peers was reported as casual and self-ensuring. The participants felt more comfortable to seek help from their peers. None of the participants shared concerns of contacting classmates for assistance in online courses. To minimize the influence of cultural and linguistic differences, many participants chose to form sub-groups with those who were from a similar cultural background and spoke the same language. This may indicate that peers were considered as equivalent counterparts and played an important role in Chinese learners' online participation. Instructors should encourage more peer-to-peer interactions and create additional learning opportunities among students in online discussion. Instructors should also encourage collaboration among students from diverse cultural backgrounds and promote interactions between international students and their domestic counterparts.

Mixed Experience with Text-Based Discussion

The participants expressed mixed attitudes towards online discussions. On the one hand, the students appreciated the fact that they did not need to provide prompt responses, thus they felt less stressed when sharing their opinions with the class. Many students indicated that they were more engaged in online discussion because each student in class was given equal opportunities to express themselves. These findings confirmed previous research on Chinese learners, international students, and non-English speakers (e.g., Yildez & Bichelmeyre, 2003; Pan, Tsai, Tao, & Cornell, 2003).

This indicated that the online environment may provide Chinese learners, particularly those whose first language was not English, with more privacy and additional time to prepare for class discussion by removing barriers of being embarrassed or being shy.

On the other hand, text-based interaction in online discussion requires students to complete a higher amount of reading and writing. As a result, students have to spend more time to review the others' posts, to respond in English, and to edit their writing with grammar and spelling checks. The participants were very cautious with their responses because they viewed their posts as permanent. They also tended to avoid conflicts and disagreement, which was regarded as impoliteness or offensiveness in the Confucian-heritage culture (Shih & Cifuentes, 2003; Zhang, 2003).

The findings suggest that overall these Chinese learners were more engaged in online discussions, although it may require a higher level of reading and writing. This may indicate that the online discussion provided a more democratic learning environment. This could be attributed to the decrease of power asymmetries in the text-based online discussion. As Chester and Gwynne (1998) indicated, the online environment could make intercultural communication easier because cultural indicators were not as noticeable as they would be in a visual medium.

Conclusion

From a qualitative approach, this study investigated Chinese learners' interactions with instructors and peers in an online environment. It also revealed the influence of Confucian-heritage culture, particularly power distance, on students' online discussion experiences. This study provided evidence that the online setting benefited these Chinese learners' engagement in class discussion, but it may increase the level of anxiety in their participation. Learning, perceived by the Chinese learners, was more instructor-centered. Instructors were viewed by the students as authorities, major sources of knowledge, and possessing high power. As a result, when encountering difficulties in learning, the Chinese learners were intimidated to interact with their instructors. Instead, they tended to seek help from peers, particularly those who shared similar cultural and linguistic backgrounds.

The findings of this study can provide online educators with a better understanding of Chinese learners in the U.S. and increase their awareness of the cultural influence on students' online learning activities. This study contributed to current understanding of Chinese learners, as well as added evidence to the existing literature. This study may also be relevant for students from other cultures, learners of English as a foreign language, and other students who take online courses. Future studies could focus on other aspects of cultural influence on students' learning online and interaction of the factors in students' learning. Gender differences should be examined in future research because power distance might be perceived differently by male and female students.

References

Allen, I. E., & Seaman, J. (2006). *Making the grade: Online education in the United States*. Needham, MA: Sloan-C.

Anderson, T. (2004). Toward a theory of online learning. In T. Anderson & F. Eilloumi (Eds.), *Theory and practice of online learning* (pp. 33-54). Canada: Athabasca University. Retrieved from http://cde.athabascau.ca/online_book/ch2.html

Appana, S. (2008). A review of benefits and limitations of online learning in the context of the student, the instructor, and the tenured faculty. *International Journal on E-Learning, 7*(1), 5-22.

Ballard, B., & Clancy, J. (1991). *Teaching students from overseas: A brief guide for lectures and supervisors.* Melbourne: Longman Cheshire.

Beamer, L., & Varner, I. (2008). *Intercultural communication in the global workplace* (4th ed). Boston, MA: McGraw-Hill Irwin.

Biggs, J. (1996). Western misperceptions of the Confucian-heritage learning culture. In D. Watkins & J. Biggs (Eds.), *The Chinese learner: Cultural, psychological and contextual influences* (pp. 45-67). Hong Kong: Comparative Education Research Center, the University of Hong Kong.

Biggs, J. (1998). Learning from the Confucian heritage: So size doesn't matter? *International Journal of Educational Research, 29*, 723-738.

Bol, L., & Garner, J. (2011). Challenges in supporting self-regulation in distance education environments. *Journal of Computing in Higher Education, 23*(2-3), 104-123.

Bond, M. (1992). *Beyond the Chinese face: Insights from psychology*. Hong Kong: Oxford University Press.

Bond, M. (1996). *The handbook of Chinese psychology*. Hong Kong: Oxford University Press.

Carson, J. G. (1992). Becoming biliterate: First language influences. *Journal of Second Language Writing, 1,* 37-60.

Carson, J. G., & Nelson, G. L. (1994). Writing groups: Cross-cultural issues. *Journal of Second Language Writing, 3,* 17-30.

Chan, S. (1999). The Chinese learner – a question of style. *Education and Training, 41*(6/7), 294-305.

Chen, R. T., Bennett, S., & Maton, K. (2008). The adaptation of Chinese international

students to online flexible learning: Two case studies. *Distance Education, 29*(3), 307-323.

Chester, A., & Gwynne, G. (1998). Online teaching: Encouraging collaboration through anonymity. *Journal of Computer Mediated Communication, 4*(2), 1-9.

Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (3rd ed.). Los Angeles, CA: SAGE Publications, Inc.

Curtis, D. D., & Lawson, M. J. (2001). Exploring collaborative online learning. *The Journal of Asynchronous Learning Networks, 5*(1), 21-34.

Dunbar, R. J. M. (1998). The social brain hypothesis. *Evolutionary Anthropology, 6*, 178-190.

Esterberg, K. G. (2002). *Qualitative methods in social research.* Boston: McGraw-Hill.

Goodman, J., Schlossberg, N. K., & Anderson, M. (2006). *Counseling adults in transition: Linking practice with theory.* New York, NY: Springer.

Flowerdew, L. (1998) A cultural perspective on group work. *ELT Journal, 52*(4), 323–328.

Gerbic, P. (2006). Chinese learners and online discussions: New opportunities for multicultural classrooms. *Research and Practice in Technology Enhanced Learning, 1*(3), 221-237.

Gunawardena, C., Wilson, P., & Nolla, A. (2003). Culture and online education. In M. Moore & W. G. Anderson (Eds.), *Handbook of distance education* (pp. 753-775). Mahwah, NJ: Lawrence Erlbaum Association.

Harasim, L. (2000). Shift happens: Online education as a new paradigm in learning. *Internet and Higher Education, 3*, 41-61.

Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions, and organizations across nations* (2nd ed.). Thousand Oaks, CA: SAGE Publications.

Jones, A. (2005). Culture and context: Critical thinking and student learning in introductory macroeconomics. *Studies in Higher Education, 30*(3), 339-354.

Kennedy, P. (2002). Learning cultures and learning styles: Myth-understandings about adult (Hong Kong) Chinese learners. *International Journal of Lifelong Education, 21*(5), 430-445.

Kim, K., Liu, S., & Bonk, C. J. (2005). Online MBA students' perceptions of online learning: Benefits, challenges, and suggestions. *Internet and Higher Education, 8,* 335-344.

Lincoln, Y.S., & Guba, E.G. (1985). *Naturalistic inquiry.* Newbury Park, CA: Sage.

Liu, J. (2001). *Asian students' classroom communication patterns in U.S. universities: An emic perspective.* Westport, CT: Ablex.

McLoughlin, C. (1999). Culturally responsive technology use: Developing an online community of learners. *British Journal of Educational Technology, 30*(3), 231-245.

McLoughlin, C., & Oliver, R. (2000). Designing learning environments for cultural inclusivity: A case study of indigenous online learning at tertiary level. *Australian Journal of Educational Technology, 16*(1), 58-72.

Moore, M. G., & Kearsley, G. (2011). *Distance education: A system view of online learning (3rd ed.).* Belmont, CA: Wadsworth, Cengage Learning.

Murphy, D. (1987). Offshore education: A Hong Kong perspective. *Australian Universities' Review, 30(*2), 43-44. Retrieved from http://www.eric.ed.gov/PDFS/EJ364973.pdf

Pan, C., Tsai, M., Tsai, P, Tao, Y., & Cornell, R. (2003). Technology's impact: Symbiotic or asymbiotic impact on differing cultures? *Educational Media International, 40*(3-4), 319-330.

Rao, N., & Chan, C. K. K.(2009). Moving beyond paradoxes: Understanding Chinese learners and their teachers. (p. 4-32). In C. K. K. Chan & N. Rao (Eds), *Revisiting the Chinese learner: Changing contexts, changing education.* Hong Kong: The Comparative Education Research Centre, University of Hong Kong.

Richardson, J. C., & Swan, K. (2003). Examining social presence in online courses in relation to students' perceived learning and satisfaction. *Journal of Asynchronous Learning Networks, 7*(1), 68-88.

Samuelowicz, K. (1987). Learning problems of overseas students. *Higher Education Research and Development,* 6, 21-134.

Selinger, M. (2004). Cultural and pedagogical implications of a global e-learning programme. *Cambridge Journal of Education, 34,* 223-239.

Shih, Y. C., & Cifuentes, L. (2003). Taiwanese intercultural phenomena and issues in a United States-Taiwan telecommunications partnership. *Educational Technology Research and Development, 51*(3), 82-102.

Smith, P., Coldwell, J., Smith, S., & Murphy, K. (2005). Learning through computer mediated communication: A compassion of Australian and Chinese heritage students. *Innovations in Education and Training International, 42*(2), 123-134.

Tu, C. (2001). How Chinese perceive social presence: An examination of interaction in online learning environment. *Educational Media International, 38*(1), 45-60.

Volet, S., & Renshaw, P. (1996). Chinese students at an Australian university: Adaptability and continuity. In D. Watkins & J. Biggs (Eds.), *Learning theories and approaches to learning research: A cross-cultural perspective* (pp. 205-220). Hong Kong: Comparative Education Research Centre, University of Hong Kong.

Watkins, D. A., & Biggs, J. B. (eds.). (1996). *The Chinese learner: Cultural, psychological and contextual influences.* Hong Kong: The Comparative Education Research Centre, University of Hong Kong.

Watkins, D. A., & Biggs, J. B. (Eds.). (2001). *Teaching the Chinese learner: Psychological perspectives.* Hong Kong: The Comparative Education Research Centre, University of Hong Kong.

Wild, M., & Henderson, L. (1997). Contextualising learning in the World Wide Web: Accounting for the impact of culture. *Education and Information Technologies, 87*(3), 406-423.

Wilson, M. S. (2001). Cultural considerations in online instruction and learning. *Distance Education, 22*(1), 52-64.

Yi, H., & Majima, J. (1993). The teacher-learner relationship and classroom interaction in distance learning: A case study of the Japanese language classes at an American high school. *Foreign Language Annals, 26*(1), 21-30.

Yildez, S., & Bichelmeyer, B. (2003). Exploring electronic forum participation and interaction by EFL speakers in two web-based graduate-level courses. *Distance Education, 24*(2), 175-193.

Zhang, W. Y. (2003). A survey of online teaching in Asia's open universities. *Distance Education in China, 9*, 35-42.

Athabasca University

Assessment of the Effectiveness of Internet-Based Distance Learning through the VClass e-Education Platform

Chadchadaporn Pukkaew
Asian Institute of Technology, Thailand

Abstract

This study assesses the effectiveness of internet-based distance learning (IBDL) through the VClass live e-education platform. The research examines (1) the effectiveness of IBDL for regular and distance students and (2) the distance students' experience of VClass in the IBDL course entitled Computer Programming 1. The study employed the common definitions of evaluation to attain useful statistical results. The measurement instruments used were test scores and questionnaires. The sample consisted of 59 first-year undergraduate students, most of whom were studying computer information systems at Rajamangala University of Technology Lanna Chiang Mai in Thailand. The results revealed that distance students engaged in learning behavior only occasionally but that the effectiveness of learning was the same for distance and regular students. Moreover, the provided computer-mediated communications (CMC) (e.g., live chat, email, and discussion board) were sparingly used, primarily by male distance students. Distance students, regular students, the instructor, and the tutor agreed to use a social networking site, Facebook, rather than the provided CMC during the course. The evaluation results produce useful information that is applicable for developing and improving IBDL practices.

Keywords: Internet-based distance learning; effectiveness of internet-based distance learning; VClass e-education platform; evaluation process

Introduction

Distance learning involving communication technology such as internet-based distance learning (IBDL) enables institutions to conduct classes on limited budgets and with limited teaching staff while providing the same education quality to both distance and regular students. Royalty-free software applications that are designed for education, such as the VClass learning management system (VClass LMS), are ideal for circumventing budget and teacher shortages, and many universities have adopted IBDL. The effectiveness of online learning environments must be examined, and methodologies for evaluating this effectiveness are necessary. Therefore, this study assesses the effectiveness of the IBDL pedagogy provided by the VClass e-education platform in live mode via a designed evaluation process and discusses its implementation.

The following sections describe the research goal and objectives as well as the design and details of the evaluation process and its implementation for IBDL. Subsequently, a discussion of the results and a summary and conclusion are presented.

Research Goal and Objectives

IBDL technology is vital to educational institutions, regardless of budget and teaching staff. This technology provides the same quality of education to regular and distance students. Evaluation plays a key role in the utilization of IBDL in educational institutions.

This study assesses the effectiveness of IBDL implemented through the VClass e-education platform in an educational institution to aid in determining its feasibility in universities. Specifically, this study has the following three research objectives:

1. to design an evaluation process to assess the effectiveness of IBDL,

2. to investigate the effectiveness of VClass IBDL for regular and distance students by utilizing the designed evaluation process,

3. to further analyze the distance student experience with IBDL.

The Study

Several studies have proposed evaluation models for IBDL (Baker, 2003; Passerini & Granger, 2000; Sims, Dobbs, & Hand, 2002). Passerini and Granger (2000) proposed a development framework that comprised a behaviorist step-by-step development process that focused on the constructivist paradigm. This framework consisted of analysis, design, development, evaluation, and delivery processes, which were similar to the phases of the system development life cycle. In evaluating the framework, a variety of methods (e.g., questionnaires, user focus groups, or interviews) could be utilized as formative evaluations, and summative evaluations occurred after the instruction was

implemented. These evaluations were designed to assess the overall effectiveness of the instructional layout. Feedback on a variety of criteria, particularly the asynchronous and synchronous communication experience, could be refined from both formative and summative evaluations.   Sims, Dobbs, and Hand (2002) proposed a proactive evaluation framework by integrating the production process. The framework identified critical online learning factors and influences in planning, designing, and developing learning resources during formative assessment by focusing on the decision-making process, which was based on the complex interaction between subject-specific content, learning outcomes, and online computer-based learning environments.   The online learning factors of the proposed framework, which were considered to be critical to effective online learning, comprised strategic intent, content, learning design, interface design, interactivity, assessment, student support, utility of content, and outcomes. For the assessment criteria of this framework, five elements (i.e., assignments, examinations, project work, work placement, and authentication) were suggested to assess teacher-, peer-, or student-directed factors within the context of critical factors, including the assessment of new environments in which the performance data were collected (e.g., real-world workplace environments).   Baker (2003) proposed a framework of K-12 curriculum components to evaluate outcomes that are specific to online distance learning courses; this framework integrated an adaptation of Tyler's principles with the level of cognitive learning in Bloom's taxonomy.

Baker (2003) indicated three factors by which distance learning courses differ from traditional in-class courses: 1) a personal interaction factor, which refers to the instructor's opportunity to provide feedback and direction and to observe learning activities in real time; 2) an interaction factor, which refers to interactions among learners as they share experiences; and 3) a class attendance factor, which refers to learners' responsibility and motivation to perform the required tasks. These factors should be considered in selecting distance learning tools. Ferguson and Wijekumar (2000), as cited in Baker (2003), suggested a variety of web-based tools for distance learning instructional methods and course design strategies, including course outline posting, course notes, course reference materials, chat rooms, email, online tests, group discussion boards, digital drop boxes, interactive activities, feedback, virtual classrooms, and whiteboarding. Additionally, free distance learning tools that include the concerned factors are available on the Internet (BbCollaborate, VYEW, and WizIQ, http://lizstover.com/free-tools.html).

Comparative studies of the effectiveness of online learning remain to be reported. Several studies that assessed the effectiveness of distance learning by comparing regular and distance students found no significant differences in learning outcomes (Abraham, 2002; Shachar & Neumann, 2003; Smith & Dillon, 1999; Zhao, Lei, Yan, Lai, & Tan, 2005). Other studies found that internet-based student performance was significantly higher than classroom-based performance for four examined items (i.e., knowledge, comprehension, application, and overall exam scores) because of the increased student-centeredness of IBDL and because students prepared more effectively for the internet-

based classroom examination (Thomas, Simmons, Jin, Almeda, & Mannos, 2005). Several meta-analyses have reported that significant differences in several factors were found in studies that compared the effectiveness of regular and distance student performances (Shachar & Neumann, 2003; Zhao, Lei, Yan, Lai, & Tan, 2005). Additionally, several studies have reported that "students who had the opportunity to interact with each other face-to-face performed better than those lacking that opportunity" (Koch & McAdory, 2012).

Evaluation Elements for IBDL and VClass

In general, evaluation methods appear to be acknowledged by scholars in the field. Nevertheless, certain models may not clearly present the meanings or definitions of terms involved in educational evaluation. Therefore, this paper restates the primary terminology used in the evaluation processes as follows.

Measurement.

In relation to evaluation, "measurement" is the act or process of measuring something (Hornby, 1995; Levine, 2005). Educational measurement is the process of calculating the success of an instructional activity using a data set (e.g., test scores, midterm scores, or dropout rate).

Assessment.

Educational "assessment" refers to a process that attempts to understand and improve student learning. This process includes clarifying instructor expectations to students and setting appropriate outcomes for learning by using relevant information (Huitt, Hummel, & Kaeck, 2001; Levine, 2005).

Evaluation.

"Evaluation" entails using determined criteria and standards to assess the value of systematically acquired information regarding accuracy, effectiveness, economic efficiency, or satisfactory outcomes, either quantitatively or qualitatively. Evaluations provide relevant feedback to stakeholders (Bloom, 1956, p. 185, cited in Bloom, Hastings, & Madaus, 1971; Levine, 2005; Trochim, 2006).

Computer-mediated communication.

"Computer-mediated communication" (CMC) is the process by which people create, exchange, and perceive information when using networked telecommunications that facilitate encoding, transmitting, and decoding messages. CMC can be synchronous, for example, chat rooms, or asynchronous, for example, discussion boards and emails (Romiszowski & Mason, 1996).

Characteristics of the VClass e-education platform.

VClass LMS is a royalty-free e-education platform that was developed by Distributed Education Center (DEC), which is a subunit of the Internet Education and Research Laboratory at the Asian Institute of Technology (AIT) in Thailand. VClass aims to enable the large-scale sharing and archiving of teaching and learning resources among Thai universities, which can be delivered live or non-live using an H.264 high-definition video format with IPv4 and IPv6 technology.

VClass (DEC, 1998) in live mode uses three servers, VClass LMS, conference, and session initiation protocol (SIP). The VClass LMS server stores learning resources, student and instructor profiles, and recorded video streams, which students and instructors utilize before and after class sessions. The conference and SIP servers are used for video conferencing, streaming multimedia distribution, and instant messaging from the sender to the remote location over the internet networking system. Thus, VClass in live mode allows instructors and distance students to communicate by microphone and instant messaging in real time.

Methodology

As certain studies have suggested (Ferguson & Wijekumar, 2000, cited in Baker, 2003), the use of the educational technology of this study is based on the idea of using an educational technology that was developed and available in our country. Thus, a royalty-free software application namely VClass which was developed by DEC at AIT in Thailand was utilized.

Design of an Evaluation Process for VClass IBDL

Learning environments.

The learning environment for VClass in live mode, as illustrated in Figure 1, is divided into two parts, regular and distance classroom settings. Both settings must have internet access.
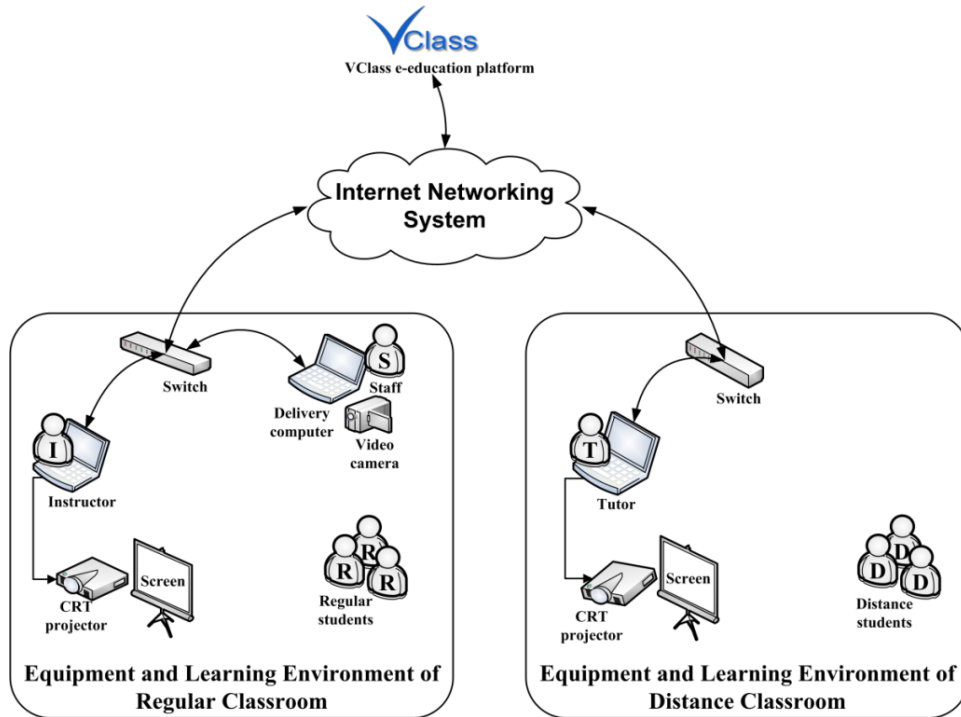
Figure 1. Learning environment for IBDL through VClass.

In the regular classroom, a few components are added: a switching hub, delivery computer, video camera, and staff. The staff member connects the equipment, logs into VClass 15 minutes before the class starts, and coordinates with the IT department regarding problems with the internet networking system. Moreover, the staff member helps the instructor monitor the communication signal via the audio device or instant messages from the remote location. After each class session, the staff member must convert the recorded video lecture into a compatible format (e.g., flv or mp4) for uploading to VClass LMS. Distance students can review the previous class on demand; this ability represents part of the subject group treatment.

The distance classroom is a normal classroom that connects to the Internet. A tutor is vital to the proper operation of the distance classroom to coordinate among the instructor, distance students, staff of the regular classroom, and IT department on the remote side. The tutor also facilitates classroom operations and solves general problems (e.g., clarifying uncertainties regarding course content, coordinating assignment submissions, and proctoring tests).

For this study, class sessions were delivered from the sender to the remote location via the internet networking system. The remote location received and distributed the live class using the equipment in the distance classroom, including a computer with a web camera and audio device for communication with the sender side. The components of these learning environments were the inputs of the system process.

Evaluation process.

The evaluation process of IBDL through VClass gauges the effectiveness of IBDL in live mode. Figure 2 illustrates how the model measures the effectiveness of IBDL. The evaluation's design was based on the definitions above for understandability, practicability, and applicability, especially for learning through IBDL technology, and applying to the evaluation of instructional activities. The process considers three main parts—IBDL technology in live mode, the instructional process of IBDL in live mode, and the evaluation of the effectiveness of IBDL—which are discussed below.

IBDL technology in live mode.

IBDL technology is evaluated regarding its efficiency or effectiveness (i.e., economy, speed, and quality). Regarding efficiency, scientific approaches can be used to evaluate the performance of IBDL technology. In contrast, the effectiveness of IBDL technology can be evaluated by measuring users' attitudes toward its features. Herein, this study adopted the existing resources and equipment of the pilot project, but they were not the primary focus of the evaluation. Nevertheless, open-ended survey questions were provided to measure users' attitudes concerning the existing resources of the pilot project.
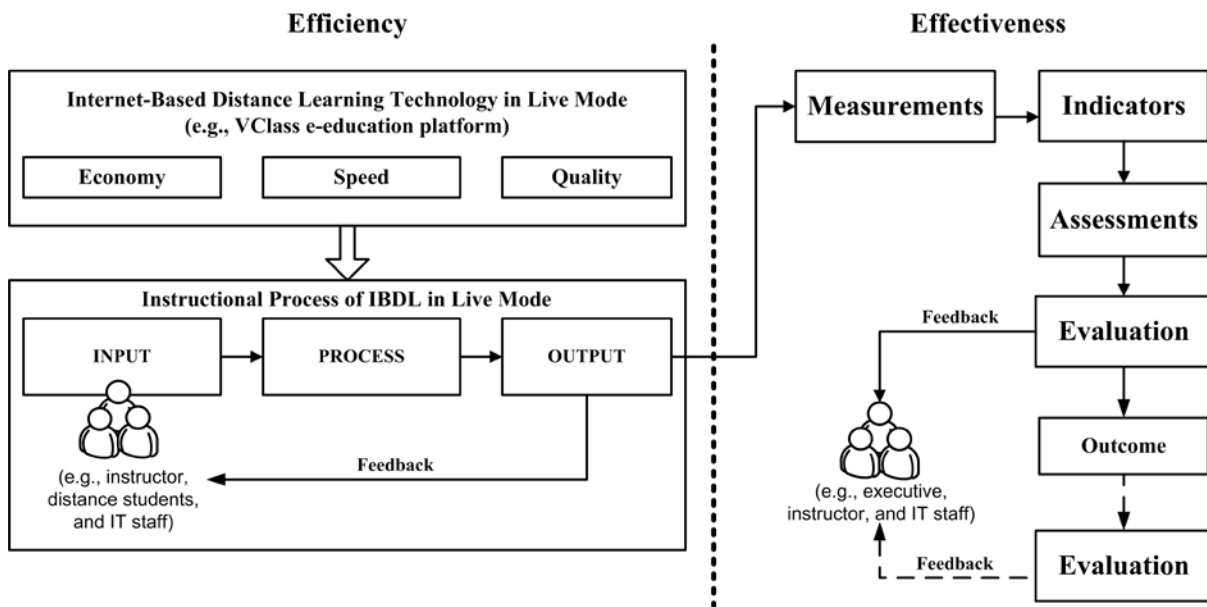
Figure 2. Evaluation process for IBDL through VClass.

Instructional process of IBDL in live mode.

The teaching and learning process is crucial in IBDL activities and consists of input, process, output, and feedback. To evaluate the instructional process, the entities involved should be considered in identifying the input, process, output, and feedback for data collection based on the research goal and objectives.

Figure 3 illustrates the entities that are involved in each part of the instructional process of IBDL in live mode. The input component involves several entities: 1) persons, including students, the instructor, and the tutor; 2) the equipment, comprising the computer that sends and receives the video/audio conference, internet connection equipment, projector, digital camera, and microphone; 3) the learning environment, including the lighting, air conditioning, and size of the distance classroom; and 4) the IBDL treatment plan for distance students, comprising the schedule of learning and communicating, grade/score level, assignment submission, and digital learning materials, including recorded video lectures and flexible office hours.

The process component refers to the methodologies or procedures (e.g., teaching and learning through VClass in live mode, selected CMC systems) that operate on input entities through the VClass system. The suggested treatment for the subject group is the adoption of CMC system technology that is free and widely available (in VClass), such as e-mail, chat rooms, and discussion boards. Recorded video lectures, another treatment for distance learning that can be used to review material throughout the course, are also suggested.
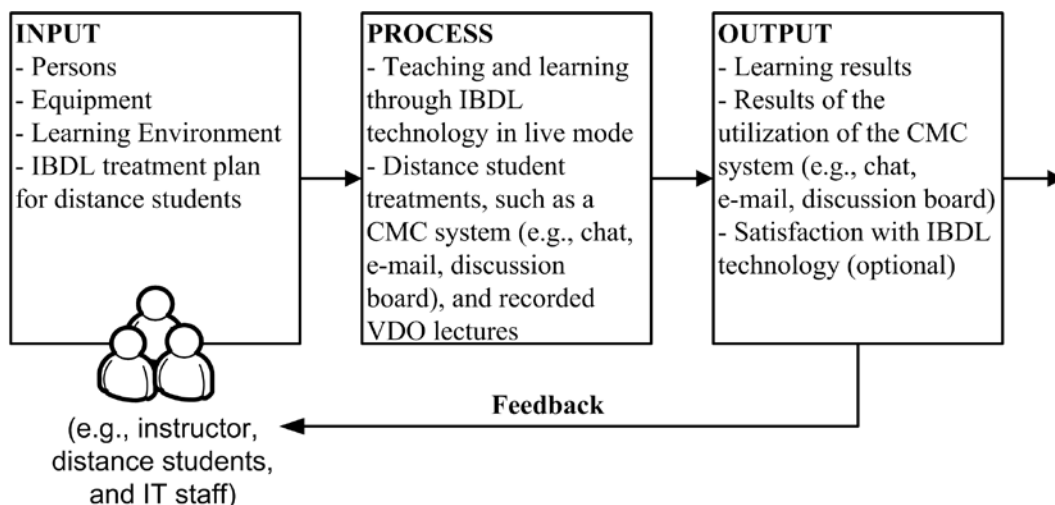

Figure 3. Input, process, and output of the instructional process of IBDL in live mode.

Once the operations of the process components are completed, the affected component (i.e., the output component) is produced. In this case, the output consists of the learning results and the utilization of the CMC system; student satisfaction with the

learning experience is an optional element. Feedback on the system process (e.g., assignment, test, and midterm scores) is sent to stakeholders as formative results for improving the input and the overall process.

The survey questions on the system process collect the general information (e.g., age, gender, educational level, internet experience, and prior IBDL course) and test results of both student groups. Distance students are also asked to complete a self-assessment and share their IBDL experience; this information is used for comparing the learning behaviors of regular and distance students. A Likert scale is employed for this assessment. The learning behaviors gleaned from the self-assessment are sorted into two categories, before and after class attendance. In the "pre-attendance" survey, the distance students are asked about the frequency of attendance, use of the CMC, downloads of learning material, and review of course content. "After-attendance" questions cover how often course content (recorded video lectures) was downloaded and reviewed and the expression of uncertainty about the course content to the instructor/tutor via each available communication channel. The number of questions that the students asked in their regular and IBDL classes is also included to evaluate the learning behavior of both groups. To evaluate their IBDL experience, the survey asks distance students open- and closed-ended questions on communication between themselves, the instructor, and the tutor through e-mail, live chat, and social media Web sites. The frequency of use of the communication channels, the utility of employing recorded video lectures, distance students' preferred communication channel, and other opinions and attitudes regarding IBDL and the communication channels are observed.

Evaluation of the effectiveness of the IBDL component.

This component comprises the evaluation process concerning the effectiveness of learning through IBDL technology. In the evaluation process, the outputs of the system process indicate the effectiveness of the learning component and should contain measures of student outcomes (e.g., minimum scores of assigned tasks, grades). The outputs of each student are analyzed statistically (e.g., average grade, standard deviation) to evaluate quantitatively and qualitatively his or her learning. Measurements are the starting point of an evaluation in the effectiveness section (Figure 2). In IBDL, the success of instructional activity hinges on learning results, and the utilization of the CMC system relies on the use of IBDL through VClass. Success is assessed by comparing the assigned indicators (e.g., grading scale, pass/fail scale for tests or assignments). The assessments, along with the other results (e.g., the use of the CMC system), are considered summative results. The evaluation results reveal the effectiveness of IBDL through VClass as justified output, or the so-called outcome. The final results are submitted as feedback to stakeholders (e.g., administrators, instructors, and IT staff) to improve the target IBDL application. Outcomes may be evaluated as input for subsequent subjects.

Herein, evaluation is defined as the systematic acquisition and assessment of

information aimed at estimating the value of various measurements of student performance. Assigned indicators evaluate student output quantitatively or qualitatively regarding accuracy, effectiveness, economic efficiency, or satisfactory outcomes for learning through VClass in live mode. Evaluation also entails the provision of useful feedback to stakeholders.

The designed evaluation process for IBDL measures, assesses, and evaluates a distance learning system to acquire information that can help to develop, improve, and affirm its effectiveness. However, before the processes are applied, the goal and objectives of the experiment must be defined, and hypotheses must be proposed. Subsequently, inputs should be identified, and a plan should be formed to describe how the system will operate on the inputs to render the desired outputs. For instructional practice, the desired outputs should be identified through testing, and indicators should be prepared to assess the measurement results (e.g., pass or fail), which should then be distributed to stakeholders as formative evaluation feedback to improve teaching and learning. Finally, the experimental hypotheses must be tested with statistics to arrive at the results of the evaluation. Data collection instruments (e.g., questionnaires, interviews, or focus groups) should be prepared accordingly. Questionnaires were used because of the ease of surveying distance students by this method. The quantitative and qualitative evaluations were based on the same measurement instrument. Validity methodology and reliability testing demonstrated the reliability of the questionnaire. Statistical analyses were then used to test the hypotheses. Once evaluation results are attained through statistical analysis, summative evaluation feedback must be given to stakeholders. The following section describes the utilization of the designed evaluation process.

Utilization of the Evaluation Process

To evaluate the effectiveness of IBDL through VClass in live mode, the second and third research objectives were examined by implementing the designed evaluation process and statistically analyzing its results. However, this study does not evaluate the efficiency of IBDL technology in live mode or the efficiency of the instructional process; only the effectiveness of IBDL is evaluated and reported. Hence, the instructional process of IBDL in live mode component focuses solely on its input, process, and output to assess statistically the effectiveness of IBDL.

The course described in this study represents the first application of IBDL at Rajamangala University of Technology Lanna (RMUTL). The Office of Academic Resource and Information Technology provided a video conference server for VClass on a conferencing channel, and the supporting team of the DEC provided the VClass e-education platform. The VClass LMS server was used to save the recorded video lectures and discussion boards for communications between the instructor and distance students. The Metropolitan Ethernet, with a bandwidth of 100 Mbps on IPv4 technology, connects the main and branch campuses of RMUTL.

Sampling and population.

Because the distribution of the population could not be calculated, non-probabilistic sampling techniques were used such as convenience sampling; nevertheless, the sampling satisfies the research objectives of the experiment (Pongvichai, 2011) as a pilot project of RMUTL. The distance classroom students were first-year undergraduates at Jomthong, a branch campus. The students were studying in the Computer Information Systems Department, Faculty of Business Administration and Liberal Arts, RMUTL, Chiang Mai campus, Thailand. This department has only one regular classroom for undergraduate students on the main campus. Therefore, "distance students" refers to students at the branch campus, and "regular students" refers to students at the main campus. The experiment was conducted during the first semester of the Computer Programming 1 course, from June to September 2011. This department's curriculum is arranged as a learning package with 25 to 35 students per classroom. A regular classroom from the main campus and a distance classroom from the branch campus were selected in the pilot project. The sample consisted of 59 students—31 distance students and 28 regular students. According to Krejcie and Morgan's (1970) table of sample sizes, this small population was sufficient to result in a 95% confidence level and could be examined using measures of central tendency.

Hypotheses.

The hypotheses were divided into the following two categories based on research objectives: 1) the effectiveness of IBDL, comparing regular and distance students, and 2) the distance students' experience with IBDL through VClass. Each category was subdivided into sub-hypotheses to examine the variables in each research objective. The expectations of this study were to acquire new knowledge from the collected information. However, only the null hypotheses are presented.

In the first category, the average score for the effectiveness of learning is an essential variable in evaluating the normal distribution of sampling. This study examines variables such as the proportion of students passing an exam based on an assigned indicator, differences in learning behavior (e.g., a student's behavior before and after class attendance), the effectiveness of learning, the relationship of overall average scores for learning behaviors with the effectiveness of learning, and the independence of gender and learning behavior from the effectiveness of learning. Therefore, seven hypotheses are set with a 0.05 significance level:

$H1.1_0$: The average scores of distance and regular students have a normal distribution.

$H1.2_0$: The proportion of distance and regular students who score 50 or higher is 85%.

$H1.3_0$: The effectiveness of learning is independent of gender for distance and regular students.

H1.4$_0$: The overall average scores of each learning behavior do not differ between distance and regular students.

H1.5$_0$: The effectiveness of learning is independent of the average scores of each learning behavior for distance and regular students.

H1.6$_0$: The effectiveness of learning for distance and regular students does not differ.

H1.7$_0$: The overall average scores of each learning behavior in the effectiveness of learning of distance and regular students do not differ.

In the second category, the communication between distance students, the instructor, and the tutor is subdivided into two groups—four hypotheses each—to evaluate communication channels (e.g., e-mail, live chats, and the social media Web site). Generally, communication channels are examined regarding the independence and differences between genders, internet experience, and effectiveness of learning. Finally, eight hypotheses are set to investigate distance students' experience with IBDL with a 0.05 significance level as follows.

H2.1$_0$: The overall average usage of each communication channel with the instructor is independent of the gender of distance students.

H2.2$_0$: The overall average usage of each communication channel with the instructor is independent of the level of internet experience of distance students.

H2.3$_0$: The effectiveness of learning and the overall average usage of each communication channel with the instructor are independent of each other.

H2.4$_0$: The overall average usage of each communication channel with the instructor does not differ by the gender of distance students.

H2.5$_0$: The overall average usage of each communication channel with the tutor is independent of the gender of distance students.

H2.6$_0$: The overall average usage of each communication channel with the tutor is independent of the level of internet experience of distance students.

H2.7$_0$: The effectiveness of learning and the overall average usage of each communication channel with the tutor are independent of each other.

H2.8$_0$: The overall average usage of each communication channel with the tutor does not differ by the gender of distance students.

Data collection instrument.

Questionnaires were used to assess the performance and opinions of distance and regular students. Punpinij (2010) stated that a questionnaire response rate of 85% is adequate for the analysis and reporting of evaluation results and that the error rate should be no more than 5%. A response rate of 90% or higher is extremely good. In the present paper, online questionnaires were produced using Google Docs. The response rate was 100%; therefore, the responses for both groups can be used for analysis.

Category of measurement instrument.

For distance students, the measurement instrument is separated into three parts, corresponding to survey question indicators: 1) participant characteristics; 2) self-assessment of learning behaviors; and 3) previous experience with IBDL. For regular students, the measurement instrument is separated into two parts: 1) student characteristics; and 2) self-assessment of learning. Quantitative and qualitative data collection utilized both closed- and open-ended questions to elicit useful information and suggestions from participants.

Validity.

The validity of each questionnaire was controlled using the content validity method. Questionnaire items were designed based on learning behavior and distance student experience with IBDL. Three experts reviewed the questionnaire items of distance students for content validity. Valid questionnaire items were selected by using the index of concordance or content validity index formula (Pongvichai, 2011) and, therefore, had values greater than +0.50. The items were modified based on the information obtained by the experts. The distance students answered the modified items, and the regular students answered all items except those pertaining to IBDL.

Reliability.

Reliability refers to the consistency of a set of measurements by a given instrument. Cronbach's alpha (Cronbach, 1951) was used to measure the reliability of the internal consistency of the survey instrument because using the test-retest method was inconvenient (Pongvichai, 2011). Cronbach's alpha is a coefficient that is used for ordered rating scale survey instruments, such as a Likert scale that measures participants' attitudes. Wasserman and Bracken (2003) suggested that Cronbach's alpha of 0.60 or higher indicates acceptable coefficient of internal consistency for group assessment. George and Mallery (2003) proposed that Cronbach's alpha of 0.7–0.8 is acceptable; 0.8–0.9 is good; and ≥0.9 is excellent. In the current study, Cronbach's alpha (α) was computed for each set of survey question indicators using SPSS.

Reliability of the measurement instrument of distance students.

Part 2, "the self-assessment of learning behaviors," is divided into two categories that represent the "before" and "after" of student attendance in the IBDL class. Quantitative data were collected from distance students using a Likert scale. Cronbach's alpha is

0.8612 and 0.9487 for the "before the class" and "after the class" data, respectively, both higher than the values suggested by Wasserman and Bracken (2003) and George and Mallery (2003).

Reliability of the measurement instrument of regular students.

Part 2, "the self-assessment of learning behaviors," is divided into the following two categories: the "before" and "after" of student attendance in the regular class. Cronbach's alpha for "before" (0.6870) is higher than the value suggested by Wasserman and Bracken (2003). Cronbach's alpha for "after" (0.9332) exceeds the values suggested by Wasserman and Bracken (2003) and George and Mallery (2003). A number of items could have been deleted without any substantial negative effect on Cronbach's alpha, but none were deleted.

The value of reliability might depend on the items in each part of the questionnaire, such that a greater number of items results in higher reliability. Moreover, participants may not answer properly, especially if there are many items. Hence, each part of the questionnaire should include only those items that are necessary to evaluate the research hypotheses. Therefore, validity and reliability play an important role in the questionnaire.

Results

Distance Student Characteristics

There were 31 students in the distance classroom (17 males, 14 females), with an age range of 18–21 years (38.70%, 48.39%, 9.68%, and 3.23% were 18, 19, 20, and 21 years old, respectively). In all, 54.84% had more than 6 years of internet experience (5–6 years, 22.58%; 3–4 years, 19.35%; and 1–2 years, 3.23%), and 16.13% had experience with distance learning.

Regular Student Characteristics

There were 28 students in the regular classroom (19 males, 9 females), with an age range of 17–22 years (3.70%, 51.90%, 25.90%, and 3.7% were 17, 18, 19, and 20–22 years old; 11.10% were unreported). In all, 55.60% had 5–6 years of internet experience, and 44.40% had 3–4 years.

Quantitative Evaluation Results

The three groups of hypotheses were tested using the Pearson chi-square test, independent samples t-test, Levene's test for equality of variances, frequency, and percentage. The Pearson chi-square test was used to calculate the independent scale.

The independent samples *t*-test measured the difference of scales between distance students and regular students. Levene's test for equality of variances measured the variances of the responses. Frequency and percentage were used to determine the number and percent of responses received.

The university grading system consisted of eight grades: A (80–100), B+ (75–79), B (70–74), C+ (65–69), C (60–64), D+ (55–59), D (50–54), and F (0–49). The percentages of distance students who received each grade are as follows: A, 10%; B+, 3%; B, 3%; C+, 19%; C, 7%; D+, 19%; D, 32%; and F, 7%. The corresponding percentages of regular students are as follows: A, 4%; B+, 4%; B, 4%; C+, 7%; C, 11%; D+, 18%; D, 7%; F, 30%; and "Withdraw," 15%. The majority of distance students received a D (32%), D+ (19%), or C+ (19%), and the majority of regular students received F (30%), D+ (18%), or C (11%). Several regular students withdrew, whereas no distance students withdrew. The results of normal distribution testing, however, indicated that two outliers in the distance classroom had extremely high scores ($>=87$). Their data were separated to evaluate individually to keep the evaluation of the remaining distance student scores correct and normal. Therefore, the questionnaire responses in the final analysis comprised 29 distance and 23 regular students. Hence, the normal distribution result of $H1.1_0$ is accepted at 0.080 for distance student and at 0.200 for regular student.

The hypothesis of the effectiveness of VClass IBDL consists of seven sub-hypotheses. Five null hypotheses ($H1.1_0$, $H1.3_0$, $H1.5_0$, $H1.6_0$, and $H1.7_0$) were accepted for both distance and regular students. For $H1.3_0$, Pearson chi-square test was used to make the calculations. The result indicates that the significance values (Asymp. Sig. [2-sided]) for distance and regular students were 0.615 and 0.175 respectively. Therefore, $H1.3_0$ was accepted. Regarding $H1.5_0$, the significance values (Asymp. Sig. [2-sided]) for distance students before and after class attendance were 0.127, and 0.490 respectively. For regular students, the result indicates that the significance values (Asymp. Sig. [2-sided]) before and after class attendance were 0.515 and 0.259 respectively. Additionally, the number of times questions were asked in class was calculated. The Pearson chi-square values for distance and regular students were 0.581 and 0.913 respectively. Therefore, the hypothesis $H1.5_0$ was accepted. For $H1.6_0$, the F-value was 1.878, and the significance value, computed using Levene's test for equality of variances, was 0.177, which is higher than the assigned significant level. The *t*-test for equality of means indicated that the *t*-value was 1.076 and significance value (Sig. [2-tailed]) was 0.287. Thus, $H1.6_0$ was accepted. $H1.7_0$ was accepted on the basis of the significance level of the individual learning behaviors of (1) distance students (before [0.317] and after [0.562], class attendance, and number of times questions were asked in class [0.063]) and (2) regular students (before [0.515] and after [0.259], class attendance, and number of times questions were asked in class [0.749]). Nevertheless, the extremely low values for the number of times questions were asked in the distance students' class (0.063) may be attributable to the average of the number of times questions were put to the instructor and to the inefficient use of the communication channels provided to the

distance students and the instructor.

For the rejected hypothesis, one null hypothesis, $H1.2_0$, was accepted for distance students but rejected for regular students. Thus, the proportion of distance students who could pass to the next subject was 85% or greater, whereas the proportion of regular students was less than 85%. For hypothesis $H1.4_0$, differences in the overall averages of each group's individual learning behaviors (e.g., before and after attending the class, asking questions in class) were evaluated. The null hypothesis $H1.4_0$ was rejected for both student groups. The indicators of each learning behavior of both groups were tested to identify differences between the groups. For "before the class," the *t*-test for equality of means indicated that the frequency of class attendance (0.002), downloading learning material (0.000), and reviewing lessons (0.001) differed between distance and regular students. That is, regular students engaged more frequently in nearly every learning behavior. For "after the class," the *t*-test for equality of means showed that reviewing lessons (0.000) and asking the instructor questions on live chat (0.023) or the discussion board (0.022) also differed between the groups. Again, regular students engaged more frequently in nearly every learning behavior. Distance students were provided with downloadable video lectures of each class in VClass LMS and a tutor who could answer questions on the communication channel, although they utilized these resources only occasionally. Overall, the average number of questions directed at the instructor during the semester was approximately two per distance student and five per regular student.

Eight hypotheses on the distance student experience with IBDL through the VClass e-education platform were tested. Four empty hypotheses ($H2.1_0$, $H2.3_0$, $H2.5_0$, and $H2.7_0$) were accepted, and the remaining hypotheses ($H2.2_0$, $H2.4_0$, $H2.6_0$, and $H2.8_0$) were rejected. For the accepted hypothesis, Pearson chi-square test was used. The results indicated that the significance value (Asymp. Sig. [2-sided]) of $H2.1_0$, $H2.3_0$, $H2.5_0$, and $H2.7_0$ were 0.217, 0.670, 0.206, and 0.433 respectively. For hypotheses $H2.2_0$ and $H2.6_0$, the independence of prior internet experience and the overall average usage of each communication channel (live chat, e-mail, and the discussion board) were tested. The results indicated that as distance students' internet experience increased, their use of communication channels with the instructor and tutor decreased. In relation to hypotheses $H2.4_0$ and $H2.8_0$, the use of live chat and the discussion board differed by gender, as male distance students utilized these channels more often than their female counterparts.

Qualitative Evaluation Results

In the qualitative evaluation, the distance students expressed the following opinions and made suggestions in their responses to the open-ended questions:

1. The downloadable video lectures of each class session are useful for reviewing material, and learning materials in digital format must be available for download before class.

2. The preferred communication channels are e-mail, live chat, discussion boards for collaborative learning, and social media websites (Facebook).

3. Some students prefer to direct questions to their tutor or instructors at the branch campus.

4. The obstacles to IBDL are as follows: (a) asking questions using a microphone via a computer is difficult, (b) the images in the real-time video stream are not clear, (c) the instructor's voice is not clearly transmitted from the amplifier, and (d) the internet connection at the branch campus is too slow.

5. Equipment and learning environment (e.g., video stream image, sound, and light) should be suitable and made available for IBDL, including stable internet speed.

6. Distance students should adapt to distance learning.

7. The instructor should teach more slowly, talk to the students, and motivate them to learn.

8. Certain distance students would prefer to learn in a regular classroom.

Summary and Conclusion

An assessment of the effectiveness of IBDL requires an intensive plan to assess the effectiveness of IBDL pedagogy. Designing an evaluation process is essential and needs to be done before working on assessment. The proposed evaluation process performs the function of assessment guidelines. This study focuses on the instruction process of IBDL in the live mode component of the evaluation process. This component represents the input, process, and output elements. Each element indicates items concerning the instruction process. This allows the evaluator to see the item involved in the instruction process as a whole and to identify the outputs required for an evaluation. Once the requisite outputs are rendered, an assessment of effectiveness can be conducted. This study used mean of statistics to assess the effectiveness of IBDL. The starting point of the effectiveness part is measurements component. Input data on the measurements (e.g., test scores and completed questionnaires) were processed using mean of statistics. Indicators (e.g., grade and assigned significance level) indicate the output of the effectiveness that is assessments component. To obtain the evaluation result, the researcher analyzes and interprets the assessment results. Then the evaluation results are sent to stakeholders to improve and approve the IBDL. An evaluation should be conducted not only at the end of the study (summative) but also during the ongoing process (formative) in order to improve the process and obtain better results at the end of the study. Regardless of whether the evaluation results are positive, they provide useful information for improving and developing the IBDL pedagogy.

Hence, after the instructional process of IBDL in live mode produced its outputs, mean of statistics was used to assess the value of systematically acquired information. Two areas for improvement were found, which support the second and third objectives of this study. First, according to the second objective, distance students engaged in learning behavior only occasionally. Surprisingly, the effectiveness of learning was the same for both groups, possibly owing to the helpfulness of the tutor, who scheduled extra classes for the distance students before examination day; the distance students' request for assistance from instructors at the branch campus; and their fear of failing the exam, which motivated them to study. Second, CMC, such as live chat, e-mail, and discussion boards, was sparingly used by distance students; most of the use was by male distance students. Moreover, social media and MSN messenger were utilized as communication channels to reduce the problems of distance and stress in communication between instructors, students, and peers. As described in several studies, teachers are highly respected and typically considered as being knowledgeable and authoritative because traditional Thai culture places a very high value on learning. Additionally, Thai students may not feel as comfortable asking questions and/or voicing their opinions as Western students; however, they listen attentively, take notes very carefully, and are well behaved (Nguyen, 2008; Pagram & Pagram, 2006). Moreover,

> [t]he high power distance characterizing Thai culture shapes the behavior of administrators, teachers, students and parents to show unusually high deference (greng jai) toward those of senior status in all social relationships which results in a pervasive, socially legitimated expectation that decisions should be made by those in positions of authority. (Hallinger & Kantamara, 2000)

These factors may explain why the interaction quality between the instructors and students was not sufficient and must be improved. However, a social network, such as Facebook, was found to be utilized by the instructor and students. The two areas, ultimately, become invaluable feedback of the study for stakeholders to analyze and to improve IBDL in live mode for better results.

In conclusion, assessments of the effectiveness of VClass IBDL did not show significant differences between regular and distance students. The utilization of educational technologies over the internet networking system may help solve the teacher shortages and tight budget problems to maintain equal instructional quality at the main and branch campus. VClass is an example that can be used as an educational and communicational technology in live mode. However, other educational technologies must also be studied. Moreover, modern social media networking sites such as Facebook play an important role in the communication between instructor, tutor, and students when they are in different times and places. Furthermore, social media provide an opportunity for students to communicate under usage agreements for academic purposes, including reducing the gap of high respect that students have for instructors, particularly in Asia. Therefore, these two observations are useful to

stakeholders in developing, approving, and improving VClass IBDL, especially by integrating Facebook into the VClass e-education platform. Additionally, the interactivity in synchronous virtual classroom methodologies may be integrated into IBDL in live mode, as suggested by certain studies (Martin, Parker, & Deale, 2012), to motivate distance students to learn and obtain immediate feedback from the instructors. Nevertheless, other IBDL technologies and CMC should be considered in IBDL pedagogy.

Acknowledgements

References

Abraham, T. (2002). Evaluating the virtual management information systems classroom. *Journal of Information Systems Education, 13*(2), 125-134.

Baker, R. K. (2003). A framework for design and evaluation of internet-based distance learning courses phase one-framework justification, design and evaluation. *Online Journal of Distance Learning, 6*(2).

Bloom, B. S., Hastings, J. T., & Madaus, G. F. (1971). *Handbook on formative and summative evaluation of student learning.* New York: McGraw-Hill.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*(3), 297-334.

Distributed Education Center, Asian Institute of Technology. (1998). *VClass.* Retrieved from VClass Web site: http://www.vclass.net

Ferguson, L., & Wijekumar, K. (2000). Effective design and use of web-based distance learning environments. *Professional Safety, 45*(12), 28-32.

George, D., & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference, 11.0 update* (4th ed.). Boston: Allyn and Bacon.

Hallinger, P., & Kantamara, P. (2000). Educational change in Thailand: Opening a window onto leadership as a cultural process. *School Leadership and Management*, 189-205.

Hornby, A. S. (1995). *Oxford advanced learner's dictionary of current English* (5th ed.). (J. Crowther, K. Kavanagh, & M. Ashby, Eds.). England: Oxford University Press.

Huitt, B., Hummel, J., & Kaeck, D. (2001). *Assessment, measurement, evaluation, and research.* Retrieved from edpsycinteractive.org Web site: http://www.edpsycinteractive.org/topics/intro/sciknow.html

Koch, J. V., & McAdory, A. R. (2012). Still no significant difference? The impact of distance learning on student success in undergraduate managerial economics. *Journal of Economics and Finance Education, 11*(1), 27.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30*, 607-610.

Levine, S. J. (2005). *Evaluation in distance education.* Retrieved from LearnerAssociates.net Web site: http://www.learnerassociates.net/debook/evaluate.pdf

Likert, R. (1932). A technique for the measurement of attitudes. *Archives of Psychology, 22*(140), 1-55.

Martin, F., Parker, M. A., & Deale, D. F. (2012). Examining interactivity in synchronous virtual classrooms. *The International Review of Research in Open and Distance Learning, 13*(3).

Nguyen, T. (2008). Thailand: Cultural background for ESL/EFL teachers. Retrieved from http://www.hmongstudies.org/ThaiCulture.pdf

Pagram, P., & Pagram, J. (2006). Issue in e-learning: A Thai case study. *The Electronic Journal of Information Systems in Developing Countries, 26*(6), 1-8.

Passerini, K., & Granger, M. J. (2000, January). A developmental model for distance learning using the Internet. *Computers & Education, 34*(1), 1-15.

Pongvichai, S. (2011). *Data analysis in statistics with computer: Emphasis on research.* Bangkok, Thailand: Chulalongkorn University.

Punpinij, S. (2010). *Research techniques in social science.* Bangkok: Witthayaphat.

Romiszowski, A., & Mason, R. (1996). Computer-mediated communication. In D. Jonassen (ed.), *Handbook of research for educational communications and technology* (pp. 438–456). New York: Macmillan.

Shachar, M., & Neumann, Y. (2003). Differences between traditional and distance education academic performances: A meta-analytic approach. *International Review of Research in Open and Distance Learning, 4*(2), 1-20.

Sims, R., Dobbs, G., & Hand, T. (2002). Enhancing quality in online learning: Scaffolding planning and design through proactive evaluation. *Distance Education, 23*(2), 135-148.

Smith, P. L., & Dillon, C. L. (1999). Comparing distance learning and classroom learning: Conceptual considerations. *The American Journal of Distance Education, 13*(2), 6-23.

Thomas, H. F., Simmons, R. J., Jin, G., Almeda, A. A., & Mannos, A. A. (2005). Comparison of student outcomes for a classroom-based vs. an internet-based construction safety course. *The American Society of Safety Engineers, 2*(1).

Trochim, W. M. (2006, October 20). *The research methods knowledge base (*2nd ed.)*.* Retrieved from The Research Methods Knowledge Base website: http://www.socialresearchmethods.net/kb/

Wasserman, J. D., & Bracken, B. A. (2003). Psychometric characteristics of assessment procedures. In I. B. Weiner, J. R. Graham & J. A. Naglieri (Eds.), *Handbook of*
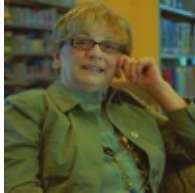
psychology: Assessment psychology (Vol. 10, p. 55). Canada: John Wiley and Sons, Inc.

Zhao, Y., Lei, J., Yan, B., Lai, C., & Tan, H. S. (2005). What makes the difference? A practical analysis of research on the effectiveness of distance education. *Teachers College Record, 107*(8), 1836-1884.

Athabasca University

Editorial – Leadership in Open and Distance Learning Notes

Marti Cleveland-Innes
LODLN Section Editor, IRRODL

One might ask "who needs leadership?" in higher education organizations, organizations full of talented, highly intellectual faculty. Highly trained as experts in a discipline or field of study, faculty are also expected to self-manage their organizations through service, and teach functions that require further expertise for which they may have little or no systematic training. In discussion with faculty, it is suggested that "like good teaching, academic leadership is not telling or transmitting information and ideas; it is a sort of conversation aimed at helping people to change and develop" (Ramsden, 1998, p. 163). If we accept these premises as true, it is reasonable to look at micro-interactional processes that support change and development, as indicated in the Powers article on leader-member exchange theory.

Founded in early versions of social exchange considerations, leader-member exchange rests on earlier exchange propositions suggested by Homans in 1958:

The Success Proposition. "For all actions taken by persons, the more often a particular action of a person is rewarded, the more likely the person is to perform that action" (under similar stimulus conditions)" (p. 16).

The Stimulus Proposition. "**If** in the past the occurrence of a particular stimulus, or set of stimuli, has been the occasion on which a person's action has been rewarded, then the more similar the present stimuli are to the past ones, the more likely the person is to perform the action, or some similar action, now" (pp. 22-23).

The Deprivation-Satiation Proposition. "The more often in the recent past a person has received a particular reward, the less valuable any further unit of that reward becomes for him" (p. 29).

The Value Proposition. "The more valuable to a person is the result of his action, the more likely he is to perform the action" (p. 25).

The Rationality Proposition. "In choosing between alternative actions, a person will choose that one for which, as perceived by him at the time, the value, *V,* of the result, multiplied by the probability, *p,* of getting the result, is the greater" (p. 43, as quoted by Emerson, 1976, pp. 339-340).

Notably behaviorist in perspective, this gives us the opportunity to consider that, in spite of the reductionist views and limitations of such thinking, this kind of internal assessment is still a part of interaction – within the chaotic influences of context and social construction (Ulh-Bien, 2011). Internal assessment is continuous throughout interaction for those doing the interacting within relationships. Key to understanding leader-member exchange is the notion that relational leadership emerges through processes of exchange in the interaction between people, and not the people themselves. It is these unique processes that single-out leadership among faculty, such that leadership in this setting must be considered as unique as the individuals and interactions themselves.

References

Emerson, R. M. (1976). Social exchange theory. *Annual Review of Sociology, 2,* 335-362.

Homans, G. C. (1965). Social behavior as exchange. *Sociological theory.* New York: Macmillan.

Uhl-Bien, M. (2011). Relational leadership theory: Exploring the social processes of leadership and organizing. In *Leadership, gender, and organization* (pp. 75-108). Netherlands : Springer.

Athabasca University

Leader-Member Exchange Theory in Higher and Distance Education

Robert Leo Power
College of the North Atlantic-Qatar, Qatar

Abstract

Unlike many other prominent leadership theories, leader-member exchange (LMX) theory does not focus on the specific characteristics of an effective organizational leader. Rather, LMX focuses on the nature and quality of the relationships between a leader and his or her individual subordinates. The ideal is for a leader to develop as many high-quality relationships as possible. This will lead to increases in subordinates' sense of job satisfaction and organizational citizenship, as well as to increased productivity and attainment of organizational goals. LMX has been criticized for its potential to alienate some subordinates, failing to account for the effects of group dynamics and social identity, and failing to provide specific advice on how leaders can develop high-quality relationships. However, LMX has been heralded as an important leadership theory in higher and distance educational contexts because of its emphasis on promoting autonomy and citizenship, as well as its ability to complement and mediate transformational leadership styles. Recent authors have attempted to provide specific advice for leaders who want to learn how to build and capitalize on the high-quality relationships described by LMX theory.

Keywords: Distance education; higher education; leader-member exchange theory; leadership; LMX; open and distance learning; social identity theory of leadership

Leader-Member Exchange Theory in Higher and Distance Education

In recent years criticism has been leveled on higher education systems in North America, as well as other parts of the world, for their perceived failure to transform themselves to meet the changing needs of society (Keller, 2008; Latchem & Hanna, 2001). Much of that criticism focuses on perceptions of stubborn adherence to outdated business models, lack of accessibility for key segments of the population, and failure to adopt technological and pedagogical innovations that will better serve the needs of learners. To this end, there has been a recent focus on transformational leadership amongst educational researchers and writers from around the globe. However, calls for the promotion of leaders with transformative visions, by themselves, are not enough to provide the type of leadership needed in higher and distance education today (Graen & Uhl-Bien, 1996). What is needed is a shift away from a preoccupation with the characteristics of effective leaders, and a focus on the behaviors of those leaders that will inspire others to follow them towards the transformation of higher education. An understanding of how effective higher and distance education leaders behave in relation to their followers can be found in leader-member exchange (LMX) theory. LMX has been described as a perfect complement to transformational leadership because of its support for the autonomous nature of academic faculty and its ability to create social capital, act as an antecedent to organizational citizenship and transformative behaviors, and promote higher quality relationships between coworkers. Leaders who want to inspire others to participate in the transformation of higher education must have a good understanding of LMX theory and its benefits. Likewise, they must be aware of its criticisms in order to avoid what some have described as potential flaws in LMX theory as a guide for effective leadership.

The Impact of Leader-Member Exchange Theory

Leader-member exchange theory (LMX) represents a departure from common leadership theories. Most theories focus on the characteristics of effective leaders. In contrast, LMX focuses on the relationships, which may be affected by personal characteristics, between leaders and followers (Graen & Uhl-Bien, 1996; Truckenbrodt, 2000). Graen and Uhl-Bien (1996) impart a sense of urgency to look beyond the traits of effective leaders by describing a taxonomy of leadership with multiple domains including the leader, the follower, and the dyadic relationship. They warn that focusing on only one domain could result in flawed research designs and understandings of effective leadership. LMX brings the follower and relationship domains into the foreground of research alongside the study of such leadership styles as transformational leadership.

The central concept of LMX is that leadership is more effective when "leaders and followers are able to develop mature [partnerships] and thus gain access to the many

benefits these relationships bring" (Graen & Uhl-Bien, 1996, p. 225). LMX focuses on the dyadic relationship between leaders and individual followers, as opposed to the organizational group (Lunenburg, 2010; Truckenbrodt, 2000). Relationships are different with each follower, with some being of higher quality than others. Followers in high-quality relationships are part of an "in-group," while those experiencing lower quality relationships are "out-group" members (Lunenburg, 2010). In-group followers enjoy increased job latitude, more open communications, and greater confidence from leaders. This often results in reciprocation from in-group followers, who assume "greater responsibility, and commitment to the success of the organization" (p. 2). Relationships with out-group members are typically governed "within the narrow limits of their formal employment contract" (p. 2). Leaders who understand the significance of LMX are empowered with the understanding that they need to avoid the creation of out-groups wherever possible, and maximize the size of the in-group upon which they can rely.

Lunenburg (2010) presents findings that validate the implications of LMX for organizational effectiveness. He demonstrates that leaders do differentiate between followers, and this differentiation is not random. Such distinctions are not desirable, and leaders should strive to maximize the number of high-quality relationships they develop with their followers. This is because out-group members may grow to resent their apparent "inferior" status, experience more stress, and be less committed to overall organizational success. In contrast, followers in high-quality LMX relationships demonstrate organizational commitment beyond contractual obligations, and develop a sense of citizenship that can be vital to promoting dramatic organizational change. Uhl-Bien (2003) describes how high-quality dyadic relationships enable the recognition and leveraging of the skills of the right people when those resources are needed. The relational focus of LMX can also help in identifying the right people to act as emerging leaders within an organization because it

> recognizes leadership wherever it occurs, is not restricted to a single or even small set of formal or informal leaders, and in its strongest form, functions as a dynamic system embedding leadership, environmental, and organizational aspects (Hunt & Dodge, 2001, in Uhl-Bien, 2003, p. 129).

Developing effective relationships, and identifying the right people for critical roles within an organization requires an understanding of how followers interact with each other, and with organizational leaders, in their daily routines. Academics have frequently been described as highly autonomous (Latchem & Hanna, 2001), which adds impetus to the importance of leaders developing high quality relationships on an individual basis. Academic faculty have high levels of expertise in their particular fields, and can be very passionate about issues and tasks in which they have a professional interest or stake. High quality LMX relationships can enable leaders to identify the

passions of individual academic faculty, and then draw upon these passions to foster a sense of organizational citizenship and transformative collaboration.

Graen and Uhl-Bien (1996) highlight the connection between LMX and creating transformative collaboration. They describe LMX as both transactional and transformational, noting that the evolution of highly effective relationships results in the emergence of transformative behaviors for both parties. Wang et al. (2005) provide evidence for this assertion in their study of LMX as a mediator for transformational leadership in organizations throughout China. They describe transformational leadership behaviors as social currency that effect stronger dyadic relationships. They also correlate transformational leaders' high-quality LMX relationships with more effective task performance, increased organizational citizenship behaviors, and increased willingness amongst followers to take on extra roles and change how they do their jobs. According to Wang et al. (2005, p. 429), "LMX makes transformational leadership more personally meaningful" for the follower. Wang et al.'s findings are consistent with Truckenbrodt (2000), who found that high-quality LMX relationships are antecedents for increased organizational commitment and both altruistic and compliant organizational citizenship behaviors. Sherony and Green (2002) emphasize the danger of not fostering high-quality LMX relationships as widely across an organization as possible. They note that the diversity in the LMX relationships of coworkers and their leaders is predictive of scores when examining coworker exchanges (CWX), and that too much diversity in coworkers' relationships can have a negative impact upon job performance and organizational commitment.

Addressing Criticisms of Leader-Member Exchange Theory

Recognizing the potential for LMX to help lead effective transformations within higher and distance education organizations requires an understanding of its criticisms and potential flaws as a leadership theory. Identifying criticisms will enable leaders to make proactive decisions about the appropriateness of LMX in their own contexts, and to avoid potential flaws that may result in counterproductive leadership.

A web search of the term LMX turns up numerous supporting and detracting sites. Management Study Guide (2012), which offers leadership training programs, lists LMX's two main weak points as the alienation of out-group subordinates and failure to explain how to develop high-quality relationships. Lunenburg (2010) acknowledges the claim that low-quality dyadic relationships lead to resentment amongst some followers. However, as previously noted, leaders who prescribe to LMX should be aware of the dangers of potentially alienating some followers. These leaders should strive to minimize the number of out-group followers within the organization by developing as many high quality dyadic relationships as possible.

Uhl-Bien (2003) recognizes the claim made by Management Style Guide (2012) of a lack of guidance on relationship development, noting that "a question that needs to be addressed is...what leads to development of higher and lower quality work relationships (e.g., antecedents to LMX)" (p. 130). If LMX is to be used to help understand how transformational leaders are to affect necessary changes in higher and distance education, then an understanding of how to nurture high-quality dyadic relationships is essential. While the lack of such guidance has been cited as a criticism of LMX (Hogg et al., 2005; Management Study Guide, 2012; Uhl-Bien, 2003), a wealth of advice can be found in the work of several recent authors. For instance, Lunenburg (2010, pp. 3-4) cites a number of tips from Krietner and Keninki (2010), and provides a detailed outline of five distinct stages in the development of high-quality relationships. The stages described by Lunenburg involve building upon a sense of mutual trust between leaders and followers. This trust and reciprocating collaboration eventually advances beyond self-interest for either party, and into a relationship based upon both clear role expectations and shared "commitment to the vision, mission and objectives" of the organization (p. 3). When that vision, mission and objectives entails adoption of education innovation and the transformation of institutional structures, following the stages and tips outlined by Lunenburg can help to make such transformations personally meaningful for all parties (Wang et al., 2005) and spread the sense of organizational commitment as far throughout the institution as possible.

Hogg, Martin, Epitropaki, Mankad, Svensson, and Weeden (2005) present another criticism of LMX as its failure to consider the wider social context in which organizational leadership occurs. They outline two organizational case studies where social identity theory of leadership more accurately predicted the leadership styles that would be favored by followers. Hogg et al. claim that LMX predicts followers will favor leaders who show a highly personalized interactive style. However, an exploration of the effects of group identity in Scottish and Indian business and industrial organizations demonstrated favor for a highly depersonalized leadership style, where leaders were recognized for practicing less favoritism, and regarded as more fair and equitable.

Hogg et al.'s (2005) studies are based in business and industrial cultures. The assertion that followers will prefer a depersonalized, equitable leader is premised on the primacy of group identity amongst individual employees. However, as previously noted, academics are frequently described as highly autonomous (Latchem & Hanna, 2001), and LMX does present an appropriate theory for describing effective working relationships in higher and distance education institutions. Additionally, a follower's personal preference for a depersonalized leadership style does not negate the significance of LMX. Leaders who draw upon LMX are more able to identify the type of relationship and amount of direct leadership desired by each follower, and are able to tailor their individual leader-follower relationships accordingly. Graen and Uhl-Bien (1996) acknowledge that LMX focuses on individual dyadic relationships for the sake of simplicity. They also note that within complex organizations, leaders often interact with multiple followers "working together in some type of interacting collectivity" (p. 233),

and that LMX should be further examined within the context of network assemblies in order to paint a more complete picture of effective organizational leadership.

Conclusions

Leader-member exchange (LMX) theory belongs to one of the first described taxonomies of domains of leadership and, as such, is significant for anyone wanting to understand how to implement effective leadership. LMX is significant in higher and distance education leadership contexts because of its close correlation with transformational leadership, which has gained recent prominence due to the frequently expressed need to transform institutions of higher learning to meet the changing demands of society. While LMX has been criticized for failing to account for group dynamics, prominent LMX researchers and writers have described the coexistence of complex collectives, or network assemblies, within the domains necessary to gain a complete picture of effective leadership. In addition, arguments based on the primacy of group dynamics and social identity may not be appropriate within the context of leadership in education, where followers are routinely afforded, and enjoy, a sense of relative autonomy. Instead, LMX offers insight into how high-quality leader-follower relationships mediate, and act as an antecedent to, transformative behaviors within organizations. Concerns that LMX is an incomplete leadership theory because of a lack of guidance on how to foster high-quality dyadic relationships have also been allayed by specific advice and tips provided by recent researchers and authors. While LMX does not present a complete understanding of effective leadership, it provides insight into a crucial domain of leadership that must be understood alongside leadership theories and strategies that focus on the traits and behaviors of individual leaders.

References

Graen, G., & Uhl-Bien, M. (1996). Relationship-based approach to leadership: Development of leader-member exchange (LMX) theory of leadership over 25 years: Applying a multi-level multi-domain perspective. *The Leadership Quarterly, 6*(2), 219-247. DOI: 10.1016/1048-9843(95)90036-5.

Hogg, M. A., Martin, R., Epitropaki, O., Mankad, A., Svensson, A., & Weeden, K. (2005). Effective leadership in salient groups: Revisiting leader-member exchange theory from the perspective of the social identity theory of leadership. *Personality and Social Psychology Bulletin, 31*(7), 991-1004.

Latchem, C., & Hanna, D (2001). *Leadership for 21st century learning: Global perspectives from educational innovators.* New York: Routledge.

Lunenburg, F. (2010). Leader-member exchange theory: Another perspective on the leadership process. *International Journal of Management, Business and Administration, 13*(1), 1-5. Retrieved from http://www.nationalforum.com/Electronic%20Journal%20Volumes/Lunenburg.%20Fred%20C.%20Leader-Member%20Exchange%20Theory%20IJMBA%20V13%202010.pdf

Management Study Guide (2012). *Leader-member exchange (LMX) theory.* Retrieved from http://managementstudyguide.com/lmx-theory.htm

Sherony, K., & Green, S. (2002). Coworker exchange: Relationships between coworkers, leader-member exchange, and work attitudes. *Journal of Applied Psychology, 87*(3), 542-548. DOI: 10.1037/0021-9010.87.3.542

Truckenbrodt, Y. (2000). The relationship between leader-member exchange and commitment and organizational citizenship behavior. *Acquisition Review Quarterly—Summer 2000*, 233-244. Retrieved from http://www.au.af.mil/au/awc/awcgate/dau/truck.pdf

Uhl-Bien, M. (2003). Relationship development as a key ingredient for leadership development. In Murphy, S. & Riggio, R. (Eds.), *The future of leadership development* (pp. 129-147). Mahwah, NJ: Lawrence Erlbaum Associates.

Wang, H., Law, K., Hackett, R., Wang, D., & Chen, Z. (2005). Leader-member exchange as a mediator of the relationship between transformational leadership and followers' performance and organizational citizenship behavior. *Academy of Management Journal, 48*(3), 420-432. DOI: 10.5465/AMJ.2005.17407908

Athabasca University