

A world map graphic with a grid pattern, rendered in orange and white, positioned at the top of the page.

# OPEN PRACTIS

Volume 9, issue 1  
January–March 2017

**OPEN PRACTIS**



INTERNATIONAL  
COUNCIL FOR OPEN AND  
DISTANCE EDUCATION

[www.openpraxis.org](http://www.openpraxis.org)

## Editorial policies

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

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

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

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

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

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

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

## Editorial team

### Editor

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

### Consultative editor

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

### Editorial board

Hemlata Chari, University of Mumbai, India

Gangappa Kuruba, University of Botswana, Botswana

Thomas P. Mackey, SUNY Empire State College, New York, United States

Alan Tait, The Open University, United Kingdom

Belinda Tynan, RMIT University, Melbourne, Australia

Joel Warrican, University of the West Indies, Barbados

Yang Zhijian, Open University of China (OUC), China

## Publisher and contact information

ICDE—International Council for Open and Distance Education

Lilleakerveien 23

0283 Oslo, Norway

[editor@openpraxis.org](mailto:editor@openpraxis.org)

[www.openpraxis.org](http://www.openpraxis.org)

<http://dx.doi.org/10.5944/openpraxis>

ISSN 2304-070X

## Journal history

The ICDE Bulletin changed its name to *Open Praxis* in 1993. In 2003 became an electronic journal. In 2011 *Open Praxis* is relaunched as an scholarly and peer-reviewed open access journal, hosted by [Universidad Nacional de Educación a Distancia \(UNED\)](#) in its first period (2011–2017).

## Copyright notice

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

- a. Authors retain copyright and grant *Open Praxis* right of first publication with the work simultaneously licensed under a [Creative Commons Attribution 4.0 International License](#) that allows others to share the work with an acknowledgement of the work's authorship and initial publication in *Open Praxis*.
- b. Authors also grant ICDE right to publish a printed compendium of *Open Praxis* published articles in an annual basis.
- c. Authors are able to enter into separate, additional contractual arrangements for the non-exclusive distribution of the journal's published version of the work (e.g., post it to an institutional repository), with an acknowledgement of its initial publication in *Open Praxis*.

*Open Praxis* does not necessarily agree with opinions and judgements maintained by authors

## Table of Contents

### Editorial

#### **Brief report on Open Praxis figures and data (2016)**

Inés Gil-Jaurena

3

### Research articles

#### **For whom, and for what? Not-yetness and thinking beyond open content**

Amy Collier, Jen Ross

7

#### **Lay Theories Regarding Computer-Mediated Communication in Remote Collaboration**

Karl Parke, Nicola Marsden, Cornelia Connolly

17

#### **Implementing the First Cross-border Professional Development Online Course through International E-mentoring: Reflections and Perspectives**

Buddhini Gayathri Jayatilleke, Geetha Udayanganie Kulasekara,  
Malinda Bandara Kumarasinha, Charlotte Nirmalani Gunawardena

31

#### **A MOOC approach for training researchers in developing countries**

Ravi Murugesan, Andy Nobes, Joanna Wild

45

#### **Current Status of the MOOC Movement in the World and Reaction of the Turkish Higher Education Institutions**

Cengiz Hakan Aydin

59

#### **Analysis of Student and Faculty Perceptions of Textbook Costs in Higher Education**

Michael Troy Martin, Olga Maria Belikov, John Hilton III, David Wiley,  
Lane Fischer

79

#### **Measures of student success with textbook transformations: the Affordable Learning Georgia Initiative**

Emily Croteau

93


### Innovative practice articles

#### **Building a Virtual Learning Environment to Foster Blended Learning Experiences in an Institute of Application in Brazil**

Andrea da Silva Marques Ribeiro, Esequiel Rodrigues Oliveira,  
Rodrigo Fortes Mello

109

## Brief report on Open Praxis figures and data (2016)

Inés Gil-Jaurena 

Editor for Open Praxis. Universidad Nacional de Educación a Distancia - UNED (Spain)

[editor@openpraxis.org](mailto:editor@openpraxis.org)

In this first issue in 2017, as we did in past years (Gil-Jaurena, 2015, 2016a), we briefly report on some illustrative statistics and information about *Open Praxis* development, covering until publication of volume 8 in 2016 and providing specific data about that volume. Table 1 includes different journal statistics: number of submissions and number of finally published papers; acceptance rates; number of authors and reviewers; paper views (as reported by OJS reports).

*Open Praxis* volume 8 had 61 authors (excluding editor) from 14 different countries that got their research papers, innovative practice papers or book reviews, a total of 30, accepted for publication. Considering the international scope of the journal, contributions are geographically and institutionally balanced. The 61 reviewers reflect a geographical and institutional balance, as well, as shown in the list available in the *Open Praxis* website (<http://openpraxis.org/index.php/OpenPraxis/pages/view/reviewer>).

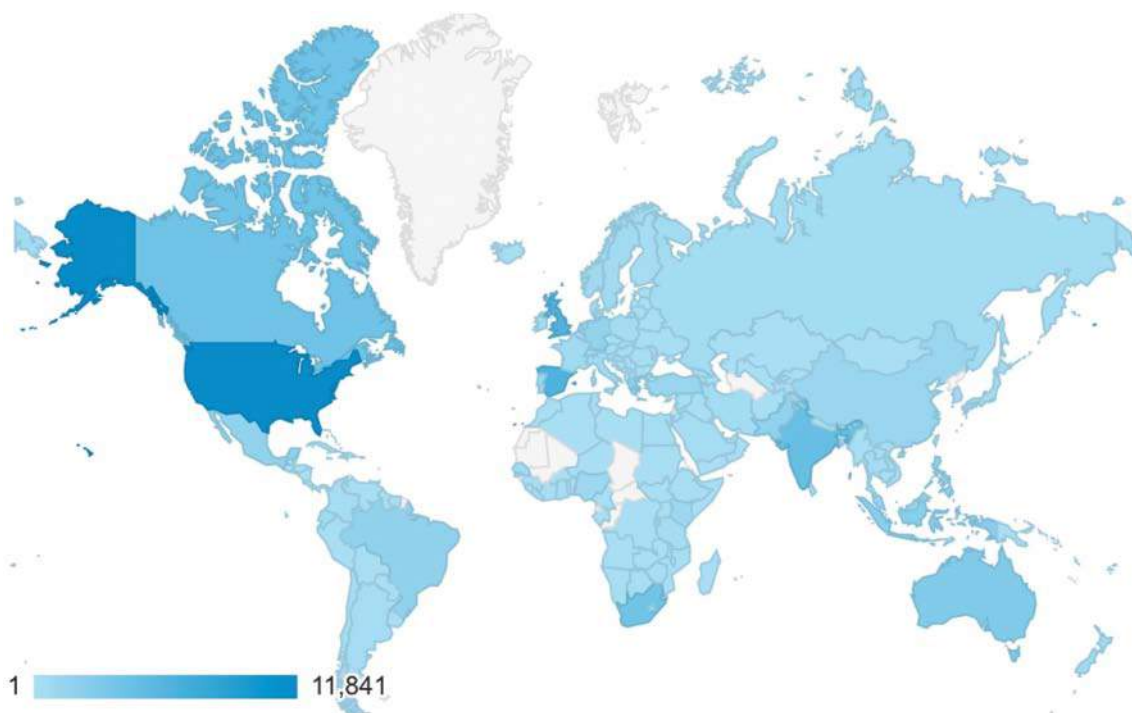
**Table 1: Journal statistics per year**

	2013, volume 5 issues 1-4	2014, volume 6 issues 1-4	2015, volume 7 issues 1-4	2016, volume 8 issues 1-4
Issues published	4	4	4	4
<b>Items published</b>	<b>38</b>	<b>35</b>	<b>33</b>	<b>34</b>
Research papers	21	16	13	14
Innovative practice papers	2	6	3	2
Special papers*	9	9	11	8
Editorial	4	4	4	4
Software or book reviews	2	-	2	6
<b>Total submissions</b>	<b>56</b>	<b>52</b>	<b>57</b>	<b>63</b>
Rejected before peer-review	10	10	10	15 (+ 4 book reviews)
Peer reviewed	44	42	45	38
Accepted	32	31	27	24
Days to review	44	35	49	58
Days to publication	125	100	92	150
<b>Acceptance rate</b>	<b>60,70%</b>	<b>59,61%</b>	<b>50,88%</b>	<b>45,28%</b>
Number of authors	65	81	71	65
Average authors per paper	1,7	2,3	2,15	1,91

	2013, volume 5 issues 1-4	2014, volume 6 issues 1-4	2015, volume 7 issues 1-4	2016, volume 8 issues 1-4
Number of reviewers	45	53	61	59
Abstract views (until March 15th 2017)	330009	208271	113288	29297 (only issues 1, 2 and 3)
Full paper views (until March 15th 2017)	150978	98130	69717	18424 (only issues 1, 2 and 3)

\* Special papers: ICDE prizes 2013 and 2015, *Open Education Consortium Global Conference* selected papers 2014, 2015 and 2016)

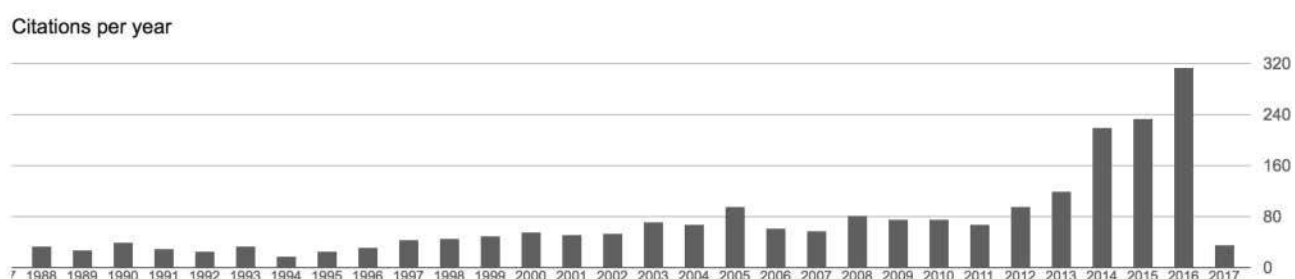
Regarding visitors and readers, figure 1 shows their location. Since publication of issue 5(1) in January 2013 until February 28th 2017, the *Open Praxis* website has had visits from 197 countries, being the top ten the following (in descending order): United States, Spain, United Kingdom, India, Canada, South Africa, Palestine, Australia, Indonesia and Greece.



**Figure 1: Location of visitors to *Open Praxis* website (January 2013–February 2017)**

Source: Google Analytics

About the academic impact, citations to *Open Praxis* in scientific publications (journals, conference proceedings, books and other specialized works) have progressively increased since the relaunching of the journal in 2013 (figure 2). *Open Praxis* h-index is 20 (source: [Google Scholar](#), March 20th, 2017).



**Figure 2: Citations to *Open Praxis* per year. 1986–2017**

Source: Google Scholar

After this brief report, what follows is an introduction to the first *Open Praxis* issue in volume 9, which includes seven articles in the research papers section and one innovative practice paper. Thanks to a grant we have received from OpenAIRE in the Alternative Funding Mechanism for APC-free Open Access journals and platforms under the EC FP7 Post-Grant Open Access Pilot (<https://blogs.openaire.eu/?p=1701>), *Open Praxis* is undertaking some technical improvements, one of them being that the papers in this issue are published in three different formats: the traditional pdf is accompanied by html and xml versions. Another improvement relates to the inclusion of authors' ORCID identifiers in each paper and metadata, as we informed in the last issue in 2016 (Gil-Jaurena, 2016b).

In the first article, Amy Collier and Jen Ross (*For whom, and for what? Not-yetness and thinking beyond open content*) introduce a new concept, not-yetness, that challenges the discourse about openness and technology and education from a critical perspective. Their analysis goes beyond the dichotomy open/close and puts the focus on overcoming simplification and raising issues of power and inclusion that widen the meanings of 'open' in education. The authors illustrate this new approach with examples, and the paper results on an invitation to educators to consider this new lens and reflect about open practices from a different perspective.

The next three papers report about studies undertaken in relation to online course experiences.

In this regard, Karl Parke, Nicola Marsden and Cornelia Connolly (*Lay Theories Regarding Computer-Mediated Communication in Remote Collaboration*) have explored students' previous ideas about CMC and their evolution after experiencing it in a remote collaboration that involves students from various European universities in a master course, which includes CMC in the study contents. The paper describes the course and presents a qualitative analysis of students' final reports, where their lay theories about CMC emerge. The authors discuss how the previous intuitive ideas and expectations evolve and change in most cases, highlighting the relevance of examining and challenging students lay theories.

In the next paper, Buddhini Gayathri Jayatilleke, Geetha Udayanganie Kulasekara, Malinda Bandara Kumarasinha and Charlotte Nirmalani Gunawardena (*Implementing the First Cross-border Professional Development Online Course through International E-mentoring: Reflections and Perspectives*) report on an international online course for online teachers that used the cycle of inquiry in its design. They collect qualitative information from learners (who were also academics in their respective institutions) and faculty. Thus, through reflective practice, they analyse the course and provide a set of useful recommendations for other faculty of managers willing to implement similar initiatives.

Finally, Ravi Murugesan, Andy Nobes and Joanna Wild (*A MOOC approach for training researchers in developing countries*) analyze a specific course, also addressed to academics, oriented to promoting research publishing among them. The course, implemented in a MOOC format, is based

on the Community of Inquiry model. The authors describe and analyze it, providing information about learners' profile and performance in the MOOC, as well as the results of a follow-up survey that measured the positive impact of the MOOC in improving research publishing.

Also dealing with the topic of MOOCs, Cengiz Hakan Aydin (*Current Status of the MOOC Movement in the World and Reaction of the Turkish Higher Education Institutions*) provides a detailed survey-based analysis of MOOCs in the Turkish context. Framed in a European project that explored MOOCs from a European perspective and confronted it to a USA perspective, this paper focuses on the specific results found in Turkey, in comparison with Europe and USA. The study covers topics of awareness, perspectives, adaptation strategies and refraining reasons regarding MOOCs in Turkish Higher Education, and includes identified challenges and recommendations at different levels.

The last two articles in the research papers section deal with open textbooks in USA contexts.

In the first one, Michael Troy Martin, Olga Maria Belikov, John Hilton III, David Wiley and Lane Fischer (*Analysis of Student and Faculty Perceptions of Textbook Costs in Higher Education*) document a survey based research develop in their university, where they have collected detailed opinions from students about textbook costs and from faculty about open textbooks as a type of OER. The authors advocate for open textbooks based on the results of the study, which provides evidence of the limitations derived from textbooks cost for many students and of the demand, from faculty, for support to move towards OER.

In the second paper about open textbooks, Emily Croteau (*Measures of student success with textbook transformations: the Affordable Learning Georgia Initiative*) focuses on analyzing the results of an already ongoing initiative, specifically its impact on students' outcomes. Besides saving students' money, this quantitative study shows that the initiative that replaced traditional textbooks with OER did not have a negative effect in various indicators, such as final grades or completion rates. Advocacy for OER becomes an issue in this paper, as well.

Finally, Andrea da Silva Marques Ribeiro, Esequiel Rodrigues Oliveira and Rodrigo Fortes Mello present an innovative practice paper (*Building a Virtual Learning Environment to Foster Blended Learning Experiences in an Institute of Application in Brazil*), which describes the experience in the educational centre (from elementary to high school) attached to their university where graduate and master students get part of their teacher education. The innovation consists in the implementation of a VLE, where students were involved also as part of their teacher education. The paper reports on the initiative, explaining different decisions made and envisioning next steps in the project.

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

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

## References

- Gil-Jaurena, I. (2015). Brief report on *Open Praxis* figures and data (2013–2014). *Open Praxis*, 7(1), 3–6. <http://dx.doi.org/10.5944/openpraxis.7.1.191>
- Gil-Jaurena, I. (2016a). Brief report on *Open Praxis* development. *Open Praxis*, 8(1), 3–7. <http://dx.doi.org/10.5944/openpraxis.8.1.296>
- Gil-Jaurena, I. (2016b). Introduction to *Open Praxis* volume 8 issue 4. *Open Praxis*, 8(4), 281–282. <http://dx.doi.org/10.5944/openpraxis.8.4.501>


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

## For whom, and for what? Not-yetness and thinking beyond open content

Amy Collier 

Middlebury College (USA)

[acollier@middlebury.edu](mailto:acollier@middlebury.edu)

Jen Ross 

University of Edinburgh (United Kingdom)

[jen.ross@ed.ac.uk](mailto:jen.ross@ed.ac.uk)

### Abstract

This article traces a line through contemporary critical perspectives on open online education, which challenge an emphasis on content and access that gives too much weight to instrumental goals of education. This article offers the concept of ‘not-yetness’ as a productive lens for examining alternative meanings of openness. Not-yetness emerged as a response to a dominant discourse of technology in education—including technologies of openness—that has been characterised by rhetoric of control, efficiency, and enhancement. Not-yetness invites a rethinking of online learning and digital education in terms of risk, uncertainty, and messiness and brings our attention to the variability of open education contexts and learners. Using examples of a ‘federated wiki’ and ‘agents beyond the course’, the article shows how higher education pedagogies can and should engage with boundary-crossings between openness and closure, and demonstrates the value of the perspectives that such engagements bring to the fore.

**Keywords:** boundaries; risk; critical perspectives; open education; online learning; digital education; not-yetness; complexity; emergence

### Introduction

In open education practice and research, there has been a persistent assumption that openness is an absolute positive (Bayne, Knox, & Ross, 2015). The result of this assumption has been the investment of time and energy in solving problems of access to educational resources, to the exclusion of other considerations. Treating openness as an absolute good has also generated a preponderance of its use as a ‘buzzword’ to describe a whole range of digital practices, some of which are seen as antithetical to a vision of positive educational change:

[Original advocates of openness] are despondent about the reinterpretation of openness to mean ‘free’ or ‘online’ without some of the reuse liberties they had envisaged. Concerns are expressed about the commercial interests that are now using openness as a marketing tool. . . . At this very moment of victory it seems that the narrative around openness is being usurped by others. . . . (Weller, 2014, p. 3)

This paper draws together three key critical arguments countering a utopian view of openness, namely that:

- 1) there is a false binary between ‘open’ and ‘closed’ which needs to be challenged;
- 2) an overemphasis on access to content homogenises learners and their contexts;
- 3) open educational practice does not attend sufficiently to issues of power and inclusion.

In response to these critiques, we propose that open educational theory and practice needs more attention to issues of multiplicity, uncertainty and transition—framed here in terms of ‘boundary



crossings'. The concept of 'not-yetness', developed to respond to issues of oversimplification in digital education policy and practice, offers an approach to meeting this need.

### ***False binary between open and closed***

Discourses of openness in education are structured around a series of binary positions that can be misleading—with 'closed' associated with hierarchy, repression, exclusion; while 'openness' represents creativity, innovation and flexibility. In addition, the negativity associated with closure is attached firmly to the idea of formal education. Gourlay (2015) identifies a fantasy of openness as "total liberation from the perceived constraints of formal study, the rigours of assessment and engagement with expertise and established bodies of (contestable) knowledge, all of which are activities deemed hierarchical and repressive of creativity" (p. 317). Oliver (2015) points out that in insisting on the absolute value of openness, all other forms of education are positioned as:

conservative, exclusionary or controlling of learners or knowledge...The risk with such polarised accounts is that education is inevitably bad, because it is and can only ever be 'closed'. (p. 367)

Attempting to move away from this unhelpful polarisation, Edwards (2015) argues that "all forms of openness entail forms of closed-ness" (p. 253)—in other words, that choices around practices always involve "selecting" and "occluding other possibilities" (p. 255). He frames the digital as reconfiguring rather than overcoming this reality (ibid). For Edwards, therefore, educators cannot claim openness as an educational value in its own right, and closedness as its antithesis, but must instead decide "what forms of openness and closed-ness are justifiable" (ibid).

If openness and closedness are not absolutes, and do not represent opposite spectrums of theory or practice, educators need strategies and conceptual resources for paying attention to and deciding what forms of openness are appropriate for the settings in which they operate. These considerations are both pedagogical and ideological, as the following two sections illustrate.

### ***Homogenisation of learners and contexts***

Utopian perspectives on openness are largely underpinned by a key assumption: that people are innately disposed to self-educate, and that individuals simply require *access to content* in order to learn. This is a contestable claim in a number of respects, not least because what it means to be an educated person has varied considerably over places and times, and because education also involves the disciplining of the human subject through, for example, the 'hidden curriculum' of schooling. In this respect, decontextualized and deinstitutionalized open content can mask the conditions of its production and the assumptions it makes about learners and learning.

If education is more than a delivery of content, then an exclusive focus on the content of open education and how accessible and affordable it is gives too much weight to instrumental goals of content creation and dissemination. In the dominant discourse about openness, open content and Open Educational Resources (OERs) in particular embed values of access, standardization, and deinstitutionalization. Their "emphasis on replication" presumes the uniformity of learners (Knox, 2013a, p. 29).

Metaphorically, the current focus on content means that an 'all-you-can-eat' ethos underpins the drive towards openness-as-access, with little attention paid to the situations or appetites of the diners. To focus on the diversity of learners would make openness and its goals more open to interpretation and to contestation. It would raise the question of what, precisely, is transformed or transformative about OERs, and might prompt us to view them as aligned with unhelpful "politics of complexity reduction" (Gough, 2012, p. 47). As McArthur (2012) puts it, complexity reduction

leads to “bad” rather than “virtuous” mess: “Seeking to force the inherently messy into a respectable tidy form can result in something that distorts, hides or falsifies the actual social world” (p. 421). Promises of simplicity—access, standardization, deinstitutionalization—come at a cost.

### *Issues of power and inclusion*

A perception that the main issue facing open education is how to separate content from elitist, restrictive, or exclusionary processes and make it more widely and freely available has been driven by what Dalsgaard and Thestrup (2015) describe as the “ideological” motive for openness. However, critiques of Open Educational Resources (OERs) question whether these “reproduce historically asymmetric power relations” (Olakulehin & Singh, 2013, p. 33). Amiel and Soares (2016) observe the need for advocates of openness to be vigilant:

to avoid constantly replicating inequalities in terms of those who produce, develop skills and revenue, and actively participate in the commons, and those who are passive observers mostly assimilating the offerings that are made available. (p. 1)

They offer the “one-way flow of English-language content to other groups” (p. 2) as an example of replicated inequality which persists in the context of OERs. These are issues that cannot be addressed with what Naidu (2016) calls a “jaundiced” and “narrow focus on free and open access to educational resources” (p. 1).

Ironically, insisting that “access alone” is enough (Knox, 2013b) actually deepens existing disadvantage by ignoring the processes through which OERs are taken up and used. As an example, research indicates that there are differences in how women in the Global South access, use, and experience barriers to finding and accessing OERs compared with both their male and Global North counterparts (Perryman & de los Arcos, 2016, p. 170), and such differences are deeply entrenched and require attention to social, economic and structural factors, leading the authors to recommend (amongst other things) that “all OER and [Open Educational Practice] projects operating in the Global South should have a gender equality component” (p. 179). In other words, access is emphatically *not* enough unless it is seen in a very broad context of social inclusion and social justice. As Rolfe (2015) puts it,

Anyone with an internet connection can access global higher education content and tuition. However, these developments have outpaced our critical thinking around the fundamental principles of how to deliver an education that is ethically sound. (no page)

The need for this kind of critical thinking cannot be overstated. Moves in this direction have included calls for openness to be framed in terms of “practices” (Ehlers, 2011) and “processes” (Knox, 2013b). These could pay more attention to “architectures” of openness (Ehlers, 2011, p. 3) and work to expose “social, economic, political and educational factors that have influenced the production of technology infrastructures, as well as the forms of open education that are subsequently made possible” (Knox 2013b, p. 27). Framing openness in terms of what we are calling ‘not-yetness’ contributes an additional focus—that of grappling with the uncertainty and complexity which accompanies educational and technological change. Having examined three arguments that complicate a straightforwardly utopian view of openness, we now proceed to explore how these arguments might be usefully taken up by reframing open education as a practice of boundary-crossing, and propose how such boundary crossing can be understood through a framework of ‘not-yetness’.

## Open education as boundary crossing

To reframe the conversation about openness and push beyond openness-as-access, we need to pay attention to other possible forms of openness rather than stop at questions of whether something is open or not, or how broadly to define openness. bell hooks (1994) reminds us that openness can be understood in a range of ways, for example as the result of a mindset in which students are co-explorers in education and the classroom is seen as a space of transgressing hegemonic boundaries:

The classroom, with all its limitations, remains a location of possibility. In that field of possibility we have the opportunity to labor for freedom, to demand of ourselves and our comrades, an openness of mind and heart that allows us to face reality even as we collectively imagine ways to move beyond boundaries, to transgress. This is education as the practice of freedom. (p. 207)

hooks' openness involves the inclusion of many voices and the recognition of the ways in which social realities—including open educational programs and processes—are political and often inequitable. This extends well beyond the notion of openness-as-access to views of openness as a “practice of freedom” (ibid), and acknowledges that such freedom may lead students and practitioners to cross boundaries between experiences and mindsets that are open and closed.

Oliver (2015, pp. 8–9) noted that boundary crossing is expected in any social institution, including education, and “instead of trying to establish whether something is ‘open or not, the focus should then be on the instances of boundary crossing that take place, and consequently the kinds of “openness” that characterise a system or institution.” The focus on boundary crossing invites critical reflections on the nature of borders between concepts and approaches, say, between openness and closedness. Anzaldua (1987, p. 3), in her seminal work deconstructing the physical, psychological, and cultural borders and borderlands between the US and Mexico, said that “Borders are set up to define the places that are safe and unsafe, to distinguish us from them. . . a borderland is a vague and undetermined placed created by the emotional residue of an unnatural boundary. It is in a constant state of transition.” As Anzaldua's writings suggest, openness and closedness are in constant tension and in flux, and educators should explore and embrace the complexities that accompany modes of openness.

### *Not-yetness: a lens for analysing openness*

We propose “not-yetness” as a lens for critically exploring openness and boundary crossing between openness and closedness. The concept of not-yetness emerged as a response to a dominant discourse of technology in education (including technologies of openness) that has been characterised by rhetoric of control, efficiency, and enhancement, and underplaying more “disruptive, disturbing and generative dimensions” (Bayne, 2014, p. 3). Emerging technologies in education, as defined by Veletsianos (2010) are those which are “not yet fully understood” and “not yet fully researched, or researched in a mature way” (p. 15). Technologies can readily be viewed in this way, but we argue that many forms of teaching and educational practice, and learner and teacher identities, can also be seen to be in states of not-yetness (Ross & Collier, 2016).

The need to maintain pedagogical space for uncertainty is an appropriate response to what Barnett and Hallam (1999) call higher education's “conditions of radical and enduring uncertainty, unpredictability, challengeability and contestability” (p. 142). The rhetoric of openness in education has come, ironically, to represent a much more constrained set of possibilities and practices than many researchers and educators might have expected in the years leading up to the explosion of high profile initiatives in areas such as massive online courses and open educational resources.

Framing openness in terms of not-yetness means accepting risk and uncertainty as dimensions of technologies and practices which are still unknown and in flux. Not-yetness offers approaches that “help us stay open to what may be genuinely surprising about what happens when online learning and teaching meets emerging technologies” (Ross & Collier, 2016), and it therefore suggests some characteristics that are undervalued when we understand openness primarily in terms of access, standardisation, and de-institutionalization:

- diversity and context;
- emergence and open-endedness;
- authority and authorship;
- blurring of formal and informal learning.

Not-yetness draws our attention back to context, to variability, and is therefore able to work against the tendencies of OERs to assume a one-size-fits-all approach. There is a real need for such attention, as even when standardisation is recognised as problematic, solutions are often superficial. For example, a recent blog post on the US government web site ([whitehouse.gov](http://whitehouse.gov)) discusses the potential flexibility of OERs to address diversity by tailoring features while “retaining fundamental content”:

an open-source model could empower educators to collaborate on and adapt textbooks across local and international borders, retaining fundamental content while tailoring certain features, like names in math word problems, to reflect students’ ethnic diversity and culture. (Culatta, Ison & Weiss, 2015)

This assumption of fundamental content as something akin to a room, stable and solid but able to be made appealing to anyone with some modest redecoration, indicates the power of the rhetoric of openness-as-access discussed above. The complexities and messiness of learning are swept under a metaphorical rug as we celebrate that our students can enter the room at all.

In addition to using the idea of not-yetness to examine practices and assumptions around OERs, not-yetness can create conceptual space for alternative modes of openness in digital education. OER proponents regularly note that mere adoption or creation of resources should not be the focus of an OER movement. Weller (2014) calls for “open pedagogy [that] makes use of open content, such as open educational resources, videos, podcasts, etc., but also places an emphasis on the network and the learner’s connections within this” (p. 10). While this can be a useful starting point, we should look for kinds of openness that call into question the very approaches we use, “taking. . . an interest in the fundamental relations of power that influence the social order and the formation of human subjectivity” (Farrow, 2015). Morris and Stommel (2014) argue that “openness can function as a form of resistance both within and outside the walls of institutions. But open education is no panacea. Hierarchies must be dismantled—and that dismantling made into part of the process of education—if its potentials are to be realized”.

Not-yetness asks, as Olakulehin & Singh (2013, p. 38) ask, “What curriculum and pedagogic designs are strong enough to challenge the dominant forces that determine the meaning, interpretation and outcomes of openness?” What kinds of spaces and practices, and in particular digital spaces and practices, invite critical reflexivity about openness and closedness?

In asking these questions, we can look to examples of how educators can use openness as a framework for critical inquiry about the *for what* and *for whom* of open education.

For instance, federated wiki<sup>1</sup> [1] provides an example of an alternative mode of openness that crosses boundaries between openness and closedness. Traditional wikis, collaborative writing spaces in which users are able to add and edit content, are often upheld as exemplar open

---

<sup>1</sup> Caulfield, M. <http://hapgood.us>

technology. However, wikis are built on servers that host one version, one copy, of a wiki page that can be served up to users for viewing and editing. Caulfield (2016a) argues that, because of that architecture and their primary design for collaboration, wikis promote consensus around dominant voices: “personal voice is meant to be minimized. Voices are meant to be merged” to a singular representation of a topic or idea. With the openness of collaboration comes a closedness to individual voice and multiple perspectives on topics.

Caulfield proposes a federated wiki as a wiki infrastructure that upends collaboration-by-consensus by allowing an individual to maintain their own copy of a wiki page that they can edit and individually control (Caulfield, 2016b). Unlike traditional wikis, federated wiki pages resolve to multiple servers but remain connected so that individuals’ copies stay linked to other copies. Federated wikis allow individuals to manage and control content while also freely sharing the content that they add and manage: a form of boundary crossing.

Beyond the affordances of federated wikis to allow individuals to intentionally navigate between openness and closedness, the use of federated wikis encourages teachers and learners to call into question how openness is shaped by the technologies we use. This, in turn, provokes useful questions about what we exchange for open collaboration and ask us, as teachers and technologists, to be transparent and critical about these choices, and sensitive to the risks and compromises they entail.

Engaging critically with openness requires approaches to learning, teaching, and assessment that welcome risk-taking, but also understand the possible risks well. Some common forms of open digital practices can be personally risky for students, especially those that involve reflection and self-expression, like blogging. With blogging the foundational notion is one of personal engagement in a digital environment for the gaze of another or others, and blogs are typically accepted as at least semi-public environments. Indeed, many teachers value them for exactly this reason: they provoke an awareness of audience and voice (Walker, 2005), and communities of learners can inspire and encourage one another (Ladyshevsky & Gardner, 2008). However, student bloggers rarely have the option to experiment with identity, or set their own limits on their exposure (Ross, 2012). So, part of the process of developing pedagogies that involve openness is considering how environments and practices can support students to set such limits (which we might productively think of as ‘closures’).

Part of the reason such limits may be needed is because of the unpredictable nature of the audience and how it might respond—what Bayne and Ross (2013) refer to as “contamination” (following Lewis and Kahn in their 2010 work on posthumanist pedagogy), where:

qualities of safety and control are abandoned in favour of an openness to ‘contamination’—best understood here as the unexpected interventions and interruptions from agents beyond the course. This kind of ‘contamination’ can take multiple forms: some are unwelcome (spamming), some are hoped for (external commentary on students’ blogs), some are inevitable. . . and others are more or less planned. . . (p. 100)

Agents beyond the course may be strangers, and they may even not be humans (the rise of Twitter bots is one example of increasingly prevalent non-human agents). As such agents are not “controllable”, McKenna and McAvinia (2011) describe how students may react by trying out identities as ‘readers’ of their own writing on the open web, making decisions based on an awareness of audience:

The students were, in part, accommodating an imagined reader and, in part, positioning themselves as readers in order to analyse their writing and a strong sense of audience was generally evident. Some students even made direct appeals for feedback from an anticipated, but unknown audience. (McKenna and McAvinia, 2011, p. 57)

In other words, exposing teaching and students' learning to an unknown audience can lead to consequences that are unpredictable both in terms of how that audience might respond, and in terms of how students will shape and position themselves as what MacNeill refers to as open practitioners—"able to express themselves and interact appropriately and openly, not just be consumers of open resources" (MacNeill, 2015). However, encounters with human and technological agents beyond the course (Bayne & Ross, 2013, p. 99) means the range of appropriate interactions may be more diverse, and more surprising, than educators imagine.

This section began with a discussion of not-yetness in relation to openness, arguing that openness in education needs to be seen in terms of criticality, power relations, risk and the unknown. These considerations are not commonly associated with open education, especially when the emphasis remains firmly on content and resources. However, new things become possible when online educators understand openness as a quality of relationship amongst students, teachers, technologies, texts, and the 'unknown audience'. We conclude with some thoughts about how a 'not-yetness' orientation to openness can generate fruitful futures for open education.

## Conclusion

This article has presented the concept of not-yetness and aligned it with critical perspectives on open education which challenge oversimplified, idealised visions of openness. There are other perspectives which can be useful in combination with not-yetness—for example, Dalsgaard and Thestrup's (2015) three pedagogical dimensions of openness: transparency between students; communication between students and the outside world; and interdependent relationships between educational institutions and external practices (pp. 85–6). Above all, not-yetness offers conceptual support for accepting and allowing context, variability, and uncertainty to inform open education, and it helps problematize an overemphasis on access to content.

We end with a call for educators, technologists and educational researchers to address and work with the risks and complexities that come along with open practices beyond open content—not to minimise the risk or resolve the complexity, but to understand these factors as part of the challenge of boundary work that involves openness and closures. The examples of federated wikis, and supporting students to engage with 'agents beyond the course', demonstrate how such boundary work can play out in practice, and emphasise how concepts like not-yetness can help us get an appropriate handle on the possibilities of digital education and its multiple relationships with openness.

For educators, a shift to thinking about openness as boundary work might result in approaches to design, assessment and collaboration that take better account of the unpredictability of gains and losses that come with decisions around openness. In addition, there may be direct applications for not-yetness in classroom activity and in discussions with students. Teachers in disciplines where critical and interpretive discourse may be comfortable in the classroom may find the notion of not-yetness appealing as a framework for exploring openness. Classroom conversation and curriculum could include opportunities for discussion of the not-yetness of the open practices and resources at use in the class, and what possibilities those uses open and close for students. In disciplines where open educational resources might be adopted primarily for their instrumental purposes (retention, reducing costs, progress toward specific metrics), teachers may look for ways to bring distinctiveness and emergence to practices around those open educational resources. Might students, for example, create a "study guide" wiki to accompany an open math textbook as a way to introduce multiple perspectives on the interplay of math and students' lives?

To close, we encourage educators to explore the uncertainty of their open practices, and offer these three questions as supports for such exploration. When considering particular forms of openness as part of a pedagogical approach or strategy, educators might ask, perhaps along with their students:

1. What space is in these practices for distinctiveness, diversity, open-endedness?
2. How much uncertainty can this approach to openness accommodate?
3. What closures come along with these practices? What is in the borderlands?

In addressing questions around open-endedness, uncertainty and closures, we can create more critical space for our open educational practices, and challenge some of the constraints occasioned by an overemphasis on the content of open education.

## Acknowledgements

We wish to acknowledge the work of Dr George Veletsianos, and the Open Education conference (November 2015, Vancouver, Canada), where this work was first presented.

## References

- Amiel, T. & Soares, T.C. (2016). Identifying Tensions in the Use of Open Licenses in OER Repositories. *The International Review of Research in Open and Distributed Learning*, 17(3). Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/2426>
- Anzaldúa, G. (1987). *Borderlands/La Frontera: The new mestiza*. San Francisco: Ann Lute Books.
- Barnett, R., & Hallam, S. (1999). Teaching for supercomplexity: A pedagogy for higher education. In P. Mortimore (Ed.), *Understanding Pedagogy and its Impact on Learning* (pp. 137–154). London: Sage.
- Bayne, S. (2014). What's the matter with "technology-enhanced learning"? *Learning, Media and Technology*, 40(1), 1–16. <http://dx.doi.org/10.1080/17439884.2014.915851>
- Bayne, S., Knox, J. & Ross, J. (2015). Open education: the need for a critical approach. *Learning, Media and Technology*, 40(3), 247–250. <http://dx.doi.org/10.1080/17439884.2015.1065272>
- Bayne, S. & Ross, J. (2013). Posthuman literacy in heterotopic space: A pedagogical proposal. In R. Goodfellow & M. Lea (Eds.), *Literacy in the Digital University: Critical Perspectives on Learning, Scholarship, and Technology*. Abingdon: Routledge.
- Caulfield, M. (2016a). Can blogs and wikis be merged? *Hapgood blog*. Retrieved from <http://hapgood.us/2016/02/22/can-blogs-and-wiki-be-merged/>
- Caulfield, M. (2016b). Connected copies: Part 2. *Hapgood blog*. Retrieved from <http://hapgood.us/2016/02/17/connected-copies-part-two/>
- Culatta, R., Ison, S. & Weiss, N. (2015). Openly licensed educational resources: Providing equitable access to education for all learners. *whitehouse.gov* blog. Retrieved from <https://www.whitehouse.gov/blog/2015/10/19/openly-licensed-educational-resources-providing-equitable-access-education-all>
- Dalsgaard, C. & Thestrup, K. (2015). Dimensions of openness: Beyond the course as an open format in online education. *The International Review of Research in Open and Distributed Learning*, 16(6). Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/2146>
- Edwards, R. (2015). Knowledge infrastructures and the inscrutability of openness in education. *Learning, Media and Technology*, 40(3), 251–264. <http://dx.doi.org/10.1080/17439884.2015.1006131>

- Ehlers, U.-D. (2011). From open educational resources to open educational practices. *Elearning Papers*, 23, 1–8.
- Farrow, R. (2015). Open education and critical pedagogy. *Learning, Media and Technology*. <http://dx.doi.org/10.1080/17439884.2016.1113991>
- Gough, N. (2012). Complexity, complexity reduction, and “methodological borrowing” in educational inquiry. *Complicity: An International Journal of Complexity and Education*, 9(1).
- Gourlay, L. (2015). Open education as a “heterotopia of desire.” *Learning, Media and Technology*, 40(3), 310–327. <http://dx.doi.org/10.1080/17439884.2015.1029941>
- hooks, b. (2004). *Teaching to Transgress: Education as the Practice of Freedom*. New York: Routledge.
- Knox, J. (2013a). The limitations of access alone: Moving towards open processes in education. *Open Praxis*, 5(1), 21–29. <http://dx.doi.org/10.5944/openpraxis.5.1.36>
- Knox, J. (2013b). Five critiques of the open educational resources movement. *Teaching in Higher Education*, 18(8), 821–832. <http://dx.doi.org/10.1080/13562517.2013.774354>
- Ladyshevsky, 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.
- Lewis, T.E. & Kahn, R. (2010). *Education Out of Bounds: Reimagining Cultural Studies for a Posthuman Age*. United States: Palgrave Macmillan.
- MacNeill, S. (2015, February). The aired washing from #oer15. *HowsheilaseesIT*. Retrieved from <https://howsheilaseesit.wordpress.com/2015/04/16/the-aired-washing-from-oer15>
- McArthur, J. (2012). Virtuous mess and wicked clarity: struggle in higher education research. *Higher Education Research & Development*, 31(3), 419–430.
- McKenna, C. & McAvinia, C. (2011). Difference and discontinuity – making meaning through hypertexts. In R. Land & S. Bayne (Eds.). *Digital Difference. Educational Futures Rethinking Theory and Practice* (pp. 45–60). SensePublishers. Retrieved from [http://link.springer.com/chapter/10.1007/978-94-6091-580-2\\_4](http://link.springer.com/chapter/10.1007/978-94-6091-580-2_4)
- Morris, S. M., & Stommel, J. (2014, November). If Freire made a MOOC: Open education as resistance. *Open Education conference*, Hilton Crystal City, Arlington, VA. Retrieved from <http://www.hybridpedagogy.com/tag/OpenEd>
- Naidu, S. (2016). The case for open educational practice. *Distance Education*, 37(1), pp.1–3. <http://dx.doi.org/10.1080/01587919.2016.1157010>
- Olakulehin, F.K. & Singh, G. (2013). Widening access through openness in higher education in the developing world: A Bourdieusian field analysis of experiences from the National Open University of Nigeria. *Open Praxis*, 5(1), 31–40. <http://dx.doi.org/10.5944/openpraxis.5.1.40>
- Oliver, M. (2015). From openness to permeability: reframing open education in terms of positive liberty in the enactment of academic practices. *Learning, Media and Technology*, 40(3), 365–384. <http://dx.doi.org/10.1080/17439884.2015.1029940>
- Perryman, L.-A. & de los Arcos, B. (2016). Women’s empowerment through openness: OER, OEP and the Sustainable Development Goals. *Open Praxis*, 8(2), 163–180. <http://dx.doi.org/10.5944/openpraxis.8.2.289>
- Rolfe, V. (2015). A systematic review of the socio-ethical aspects of Massive Online Open Courses. *European Journal of Open, Distance and E-learning*, 18(1), 52–71.
- Ross, J. (2012). Just what is being reflected in online reflection?: New literacies for new media learning practices. In L. Dirckinck-Holmfeld, V. Hodgson, & D. McConnell (Eds), *Exploring the Theory, Pedagogy and Practice of Networked Learning* (pp. 191–207). New York: Springer.



- Ross, J., & Collier, A. (2016). Complexity, Mess, and Not-yetness: Teaching Online with Emerging Technologies. In G. Veletsianos (Ed.), *Emergence and Innovation in Digital Learning: Foundations and Applications* (pp. 17–33). Edmonton, AB: Athabasca University Press.
- Veletsianos, G. (2010). *Emerging Technologies in Distance Education*. Edmonton, AB: Athabasca University Press. Retrieved from <http://www.aupress.ca/index.php/books/120177>
- Walker, J. (2005). Weblogs: Learning in public. *On the Horizon*, 13(2), 112–118.
- Weller, M. (2014). *The Battle For open: How openness won and why it doesn't feel like victory*, London: Ubiquity Press. <https://doi.org/10.5334/bam>

**Papers are licensed under a Creative Commons Attribution 4.0 International License**

## Lay Theories Regarding Computer-Mediated Communication in Remote Collaboration

Karl Parke  & Nicola Marsden 

*Hochschule Heilbronn (Germany)*

[karl.palke@hs-heilbronn.de](mailto:karl.palke@hs-heilbronn.de) & [nicola@marsden.de](mailto:nicola@marsden.de)

Cornelia Connolly 

*Dundalk Institute of Technology (Ireland)*

[cornelia.connolly@dkit.ie](mailto:cornelia.connolly@dkit.ie)

### Abstract

Computer-mediated communication and remote collaboration has become an unexceptional norm as an educational modality for distance and open education, therefore the need to research and analyze students' online learning experience is necessary. This paper seeks to examine the assumptions and expectations held by students in regard to computer-mediated communication and how their lay theories developed and changed within the context of their practical experiences in conducting a remote collaborative project, through computer-mediated communication. We conducted a qualitative content analysis of students' final reports from an inter-institutional online course on computer-mediated communication and remote collaboration. The results show that students' assumptions were altered and indicate the strong benefits of teaching how to collaborate remotely, especially if a blended approach of theory and practical application are combined.

**Keywords:** Distance Learning; Computer-mediated Communication; Lay Theories; remote collaboration

### Introduction

For distance learning environments, successfully employing computer-mediated communication (CMC) is often deemed one of the most relevant factors (Dennen, 2005; Thompson & Savenye, 2007). CMC has become embedded in the social and organizational lives of people (Walther, 2013). It is frequently used and a common tool for team collaboration, allowing participants to work on tasks without having to be at the same place at the same time. Despite this customary practice, CMC is excessively and still mostly used in private contexts, allowing users to communicate with friends or family. Consequently students of Informatics, software engineering and related subjects are not fully aware of the possibilities and limitations of computer-mediated communication for organizational and workplace environments.

Due to infrastructure and technology advances remote collaborations (RC) are becoming more commonplace and students are likely to encounter CMC in their working life. Nonetheless students, actually have vague ideas about how such remote collaboration through computer-mediated communication works—how they are scheduled and organized; which tools can or should be used; how the communication between the participants in such settings might look like; and which problems might occur when tasks are completed remotely using CMC. These ideas or assumptions often arise from comparison with practices in face-to-face settings, private use of CMC or cultural references to this topic, mainly in TV shows or movies. Such assumptions do not always reflect the reality of the matter but can nevertheless affect the way in which remote collaboration is started or dealt with once a person actually uses it. Considering the structure and purpose, such ideas often have a lot in common with actual scientific theories, which is why they can be called implicit, subjective or lay theories.

In light of how CMC has become commonplace as an educational modality for distance and open education, the need to research and analyze students' online learning experience becomes obvious (Dennen, Darabi & Smith, 2007). In this study we sought to examine what kind of assumptions and expectations students have about CMC. We wanted to know what happened to the students' subjective theories as their knowledge of CMC was developed within the classroom environment. In particular we aimed to investigate if and how students' beliefs changed when they were confronted with scientific theories and new experiences regarding computer mediated communication.

## Literature Review

Computer-mediated communication can be defined as the study of how human behaviors are maintained or altered by exchange of information through machines (December 1996). It can be defined as communicative transactions occurring through the use of two or more networked computers (McQuail, 2005). Different theoretical models have been developed to explain how individuals and groups adapt to computer-mediated (vs. face-to-face) communication, how they develop relational communication and organize their collaboration (Ang, Talib, Tan, Tan & Yaacob, 2015; Sheldon, Abad & Hinsch, 2011; Walther, Van Der Heide, Ramirez, Burgoon & Peña, 2015; Walther & Parks, 2002). Researchers have investigated Internet-based social networking supported by social software, including instant messaging, YouTube, e-mail, social networking sites (SNS) and Internet forums (Chen, Yen, Hung & Huang, 2008; Haridakis & Hanson, 2009; Hunt, Atkin & Krishnan, 2012; Ou & Davison, 2011; Papacharissi & Rubin, 2000; St. Amant, 2002; Sun, 2008; Sun, Rubin & Haridakis, 2009). Interpersonal motives for using the Internet include interpersonal utility (Papacharissi & Rubin, 2000), social utility (Kaye & Johnson, 2002), social or interpersonal interaction (Ebersole, 2000; Wolfradt & Doll, 2001), and chatting (Sjoberg, 1999). In our research we focus on text-based interaction, since the fact remains that text-based communication is still dominating the interaction on the Internet and text-based technologies are the most interactive.

Computer-mediated communication can take place in different environments: Students commonly use CMC for personal use, i.e. outside a working environment and outside educational purposes (Knight-McCord et al., 2016). More and more, corporate environments are adopting different modes of CMC for professional communication and collaboration (Carlson, Zivnuska, Harris, Harris & Carlson, 2016) and CMC is increasingly being used for educational purposes (Andersen & Ponti, 2014) or is a subject of academic learning (Howard, 2011; Marsden & Connolly, 2010). Through their personal use of computer-mediated communication and social media, individuals develop ideas of how to behave in this social setting: Understanding how people act in a social setting is influenced by the way people think about and infer meaning from what happens around them (Heider, 1958). Research on human perception, attitudes and behavior, motivation, and metacognition has shown that people's beliefs influence their perception of reality and shapes their behavior (Dweck, 1986; Fiske & Taylor, 2013; Furnham, 2013; Igou, 2004; Kruglanski, 2013; Snyder, 1984). We adopt this perspective to investigate the beliefs that students hold regarding computer-mediated communication. In order to understand how people behave in a remote collaboration setting, it is important to investigate how the conditions of computer-mediated communication are perceived and how people think they should behave under these conditions.

Research into individuals' views of communication technology shows that their experiences with personal CMC in social media influences their expectations and assumptions of CMC in work settings and influences their views about CMC (Treem, Dailey, Pierce & Leonardi, 2015). Literature shows divergent assumptions and findings regarding the influence that prior familiarity with a technology has for its use in the workplace. While there are numerous positive effects to be expected

from CMC in the workplace (Ellison, Gibbs & Weber, 2014), there are good reasons to suspect that individuals' implicit belief systems may not align well with goals in a work setting: The expression of opinions, potential disinhibition, and relationship building in personal CMC could clash with professional communication norms (Cheney & Ashcraft, 2007). The study by Treem et al. (2015) showed that the beliefs that people have regarding CMC in a work setting were related to their prior use of CMC, but in directions contrary to the expectations that prior use of CMC facilitates its use within work: Younger workers and people who had used CMC heavily in a personal context were more skeptical about the use of CMC in the workplace; older individuals and those without much experience with CMC in a personal context were more positive about the different modes of CMC in the workplace.

These views and belief systems that people use in their everyday life are called lay theories, they comprise implicit belief systems that people are not necessarily aware of, neither are they aware of the impact of those theories on their social understanding. Lay theories, like scientific theories, are constructed to make sense of the world, i.e. they serve an epistemic function (Hong, Levy & Chiu, 2001). They are organized knowledge structures, and as such set up a framework for interpreting specific situations and for making inferences about the world around us. With this sense-making function, they offer a starting point for pedagogical processes (Groeben, 2014; Groeben & Scheele, 2000). Lay theories are affected by scientific knowledge—and can be activated or deactivated based on the scientific knowledge that is offered in a particular situation (Levy, 1999). It has been shown in studies in which participants read fictitious scientific articles, the reading influenced participants to judge a social situation more in line with the “scientific” evidence that was presented to them; also, the existing lay theory could be influenced by generating persuasive arguments for a particular theory (Levy, Plaks, Hong, Chiu & Dweck, 2001). If reading a persuasive article in an experimental session can change lay theories, a classroom setting in which scientific papers are read and hands-on experiences are made should have even stronger effects. Consequently, we hoped to find similar effects on our course, in which we provided authentic scientific information and the experiences encountered by the participants in a real-life collaborative environment. After all, the purpose is to educate, inter alia by completing the participants' lay theories and hypotheses about how the object of study works with scientific knowledge and/or practical experiences.

Our research question was how students' understanding of and reflection about computer-mediated communication changes through a course covering scientific theories and practical experience regarding computer-mediated communication. Through the students' reflection of their experiences we aimed to reconstruct and explore the Intuitive Lay Theories that the students held when entering the course.

## **Method and Material**

This study is based on a qualitative content analysis of students' final reports from an inter-institutional online course on computer-mediated communication and remote collaboration.

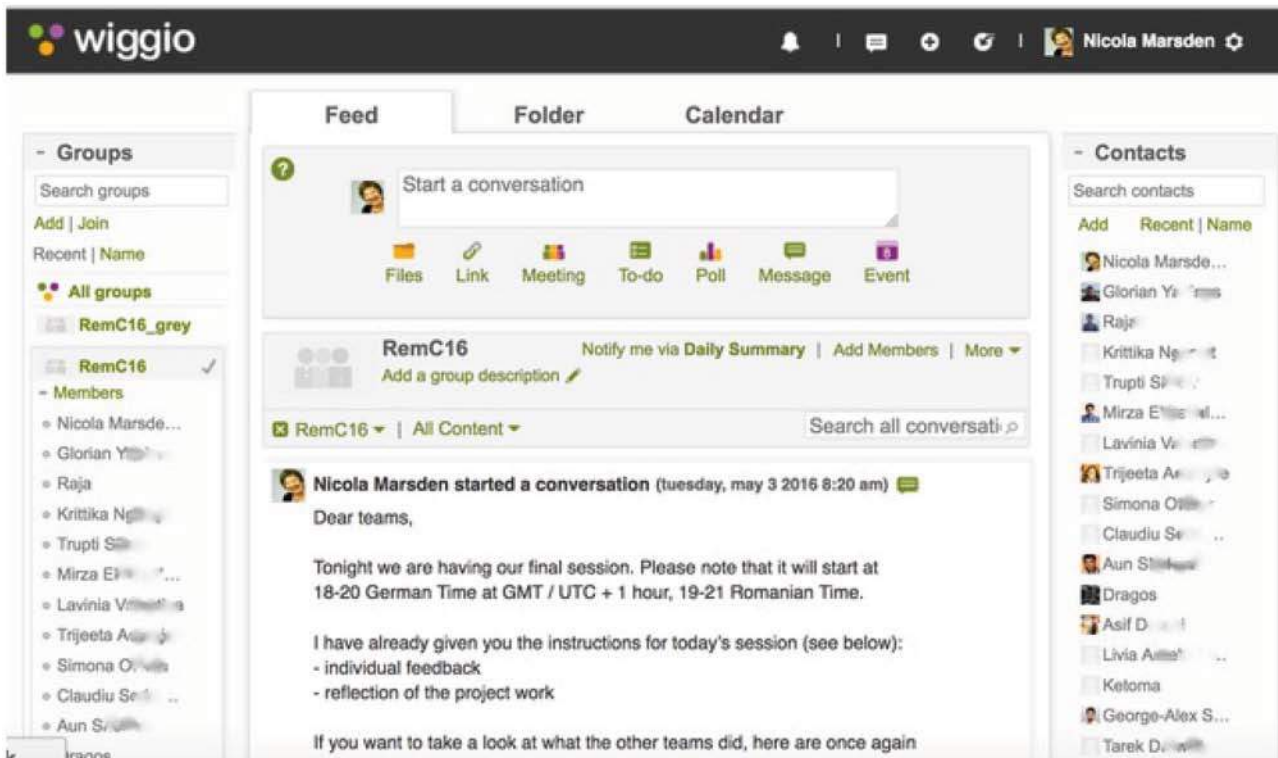
### ***The course “Computer-Mediated Communication and Remote Collaboration”***

The course or module “Computer-Mediated Communication and Remote Collaboration” is part of the master's program “Software Engineering and Management” at Heilbronn University, Germany. The course includes three to seven weeks of remote collaboration with students from Dundalk Institute of Technology, Ireland and Transilvania University of Braşov, Romania. On average, approximately 60 students attend the course from the three institutions and the course takes place

once a year in the summer semester. While the majority of the students from Romania and from Ireland have lived in these countries all their lives, the students from the German course have typically come to Germany for the master program from another country, 90% of the diverse student population originate from the Indian subcontinent, Africa, Eastern Europe, other Asian countries, or South or Middle America. About one third of the students are female and two thirds are male.

For the students from the university in Germany, the course is divided in a theoretical and a practical part. In the first lessons, which are conducted face-to-face, the students are introduced to the different theories of computer-mediated communication, learn about the discourse surrounding CMC throughout the years, and are provided with additional reading material. The practical part of the course takes place online. The students from the universities in Romania and Ireland join for this part only. The students are divided into groups of 4 to 6 members from all three universities, i.e. Germany, Ireland, and Romania. In these teams they worked on a software development project based on a detailed project description by the lecturer.

We examined data from 2011–2016, in which these team sessions took place and were organized on the online group collaboration application Wiggio (see Figure 1). The teams had access to a plenum for all students and staff, in addition they could break out into their team “rooms”. Each team and the plenum had a chat function as well as blog feeds and folders for their documents and project plans.



**Figure 1: Screenshot of the collaboration platform Wiggio**

The goal of the course was to gain knowledge on the theories of computer-mediated communication and students gained hands-on experience by working in remote teams on the tasks given by the lecturer. This approach was aimed at enabling the participants to understand the theories taught prior to teamwork sessions, and then to adopt them in the experienced reality of the sessions.

### ***Final Reports as Units of Analysis***

As stated, the students from the Irish and Romanian university joined the module for the online collaboration for the remote team project work. For the students from the German University, this project was only a part of the course, since their course also included the instruction on the theories and research in computer-mediated communication. To get full credit for their course, the students from the German master's program also had to write a final report: During the remote collaboration the students were instructed to document their experiences based on the CMC theories they had learned in the initial class meeting at the beginning of the semester and by reading the required literature provided. At the end of the course, a final report by the students from the German University documenting the process. Instructions on the final reports were detailed and contained advice on the structure of the report in order to provide complete and comparative information. The reports provided an overall description of the virtual team process, a reflection of the participants' own role in the team and an application of the theoretical approaches described in class and experienced in the virtual collaboration. By expressing the lessons learnt during the lecture, the students provided insights into their subjective (lay) theories. Since lay theories are implicit knowledge structures, they cannot be accessed directly. Rather, they need to be reconstructed based on the effects they have. One way to reconstruct these implicit theories is to identify instances in which the implicit theories are disconfirmed, i.e. the person has a reason to question the validity of their lay theory. The students' reflections regarding their experiences in the remote collaboration, their thoughts on the scientific theoretical background on CMC, and regarding the points that they considered noteworthy was used as a basis to reconstruct these implicit belief systems.

Our assumption and hope was to enquire if the initial subjective theories are influenced by the provision of this scientific knowledge and a demonstration of such a participatory experience. If so, we hoped to gain an insight into how the participants' lay theories are altered or maintained by experience and expertise.

### ***Methodology***

We examined 38 reports written from 2011 to 2016, which provided detailed information about the team-working process and the issues experienced. Based on these reports we conducted a qualitative content analysis (according to Mayring 2014). This approach conceptualizes the process of assigning categories to text passages as a qualitative-interpretive act, following content-analytical rules. Our focus was on the expressions relating to the underlying subjective theories, revealing expectations about the assumed character and procedure of the remote collaboration sessions. Furthermore, we examined whether there was any impact of theoretical knowledge observed through the practical teamwork. Our analysis was based on the "Lessons learnt" chapters of the final reports.

While examining the material, we focused on such sentences that offered information about how the participants experienced work through CMC and how they understood the theories linked to these experiences. Examining this to their earlier (lay) theories about how working through CMC would be, we also compared their experiences in face-to-face-settings or even earlier CMC in other settings, from which most of their lay theories obviously had been developed.

For the content analysis, a three-staged interpretation procedure (see Figure 2) was followed (Mayring 2014) (a.) Summary: The material was reduced in such a way that the essential content was preserved and abstracted to create a manageable corpus that still reflected the original material. For this, relevant sentences were identified, collected, and paraphrased. (b.) Explication: The material was explained, clarified, and annotated, using a narrow and a broad context analysis for each identified portion of the text. An explicatory paraphrase was made and the explication was

examined with reference to the total context. (c.) Structuring: Based on the theoretical basis, further categories were developed as dimensions for structuring. The material was categorized and the system of categories was re-examined, adding further categorizations and reappraising the material on these. Key examples were identified.



**Figure 2: Three-staged interpretation procedure (Mayring 2014)**

### **Categorization**

For the process of categorization the participants' statements were initially divided into statements about the influence of:

- the theoretical input on the perception of CMC
- the practical experience on the perception of CMC
- the combination of both theory and practice on their perception of CMC.

A further cross-categorization was made in respect to whether their assumed predictions of Computer-Mediated Communication have been seen as confirmed, disproved, or not affected by their later practical experiences. The grades of impact of the course and the coding instructions for the step were:

- Previous Intuitive lay theories seen as confirmed
- Previous Intuitive lay theories seen as generally confirmed, but the expectation and understanding of CMC has been extended or improved OR learning something completely new which might had been expected
- Previous Intuitive lay theories seen as generally disproved, with only some expectations confirmed by practice OR by learning something completely new which was unexpected
- Previous Intuitive lay theories seen as completely disproved.

The last classification, regarding the impact that the course had made, was particularly helpful to maintain focus with regard to our research question. Since our aim was to reconstruct the Intuitive lay theories which students had entered the course with, statements were only relevant if they held some information regarding the impact of the course. However often students do not explicitly refer to expectations they had prior to the course, rather the material often comprised implicit references to expectations prior to the course. In order to organise statements without explicit and reliable information regarding the participants' lay theories, another step of analysis was implemented: A cognitive hint was used in this step by sorting the paraphrased statements by the ability to attach the phrases "(nearly) as expected" or "(more) than expected" in a reasonable and meaningful manner. The resulting outcome of this step were the statements finally analyzed by content and meaning. In the end, there remained 43 statements by 17 students, which provided information about the students' view of CMC before and after the course. The statements were analyzed in the three-stage interpretation procedure presented in Figure 2 and yielded the topics presented in the following section.

## Results

The results provide insight into the intuitive lay theories regarding computer-mediated communication and remote collaboration that the students held. These lay theories can be categorized along the following five topics:

1. Organizational and working process expectations: Theories about how the working process is organized and where/when issues might appear
2. Communicational assumptions: Theories about how communication processes in CMC work and where problems might arise
3. Theories about the personal connections between the team members in Remote Collaboration
4. Theories about the reliability of the technology
5. Assumptions about CMC in general

The following section highlights the underlying lay theories about working remotely through CMC prior to the course and shows key examples for each category.

### ***Organizational and working process expectations: theories about how the working process is organized and where/when issues might appear***

In matters of organization it was assumed that working remotely through CMC would take less time and effort for organizational matters such as the scheduling of the online meetings, the preparation prior to these and the distribution of tasks and roles, as well as the difficulties in keeping track of time and common goals during the working process. This led to many corrections of former assumptions about CMC:

*“I came to know that setting up online meetings needs more time when compared to face-to-face meetings.” [AC 2]*

The assumptions were mostly made in comparison to former experiences in face-to-face settings, which seem to be perceived as more intuitive and easier to handle.

*“collaborating isn’t as easy as in case of a face-to-face communication.” [BQ 5]*

*“a good preparation is even more important for remote collaboration than for face-to-face meetings.” [BJ 4]*

Some disappointment can also be seen on behalf of the time needed to achieve results through CMC:

*“I also learned that in CMC the time taken to exchange information is four times more when compared to face to face communication [. . .]. As a result of this we had to have many meetings which were not scheduled by our professor.” [DC 3].*

### ***Communicational assumptions: Theories about how communication processes in CMC work and where problems might arise***

In regard to communication, the students obviously expected CMC to be easier to grasp than it was, referring to it after the course as ‘much more challenging.’

*“First of all, using only text to collaborate with other team members and not being able to see whom you are interacting with presented a challenge as we do not know how the other team members are reacting to the text that has been written.” [BB 1].*

Apart from not knowing how the other team members react to conversational contributions, there was some confusion about the conversational flow. The need to compensate missing cues in the progress of communication, was not expected in particular:



*“everyone was talking at the same time in the group chat, so it was a bit difficult to comprehend who was talking with whom and for effective communication with the team members we had to address the person as ‘@Person’ such that, it is clear for whom the message is meant for.” [BB 4].*

The same participant experienced and described how difficult it is to eliminate misunderstandings being caused by this lack of cues:

*“It was again evident that missing verbal communication meant if there was an issue, it was rather difficult to solve by trying to explain it in text which would have been easily explained if we had verbal means of communication. There are some cues which can be compensated using text but most of the cues are negated in text-only communication.” [BB 5]*

Not all participants seemed to have optimistic assumptions about the conversational flow of working through CMC, especially in organizing and planning prior to the meetings:

*“In CMC there were multiple discussion going simultaneously. I initially thought that it was a problem as I was not able to understand the context of the meeting.” [DC 5].*

*“What I have understood is that if proper planning and structure is provided to CMC meeting even they can be successful.” [DC 2]*

Furthermore, it seemed most of all surprising and/or frustrating to the participants, how time-consuming it can be to exchange information and come to conclusions cooperatively when communicating only by text:

*“when the team was expecting the answer/response from one of the members and due to network problem or may be he/she was taking time to construct the answers, but many times there was a delay in getting the answers. [. . .] a frustrating part to wait for the answer from a member for longer time.” [CF 3].*

*“there were situations where one member answered or typed the answer very slowly and meanwhile everyone waited. Also while a person was answering the current question, some other members jumped to the next question.” [CD 1].*

The data demonstrates that this communicational assumption was barely affected by their prior experiences with CMC:

*“During this exercise I realized that although I have used a text-based chat many times before in my life, this time it was a quite different experience because I have never talked (or met) with the participants before so I had no background context to make inferences about missing cues and in the beginning I had no clue on how to improve our communication with these constraints. I became aware of how challenging it is to effectively and efficiently communicate given the fact that you don’t know the group of people you need to work with and that you have a relatively limited mean of communication as it was in our case: a text-based only chat.” [BI 1].*

### **Theories about the personal connections between the team members in Remote Collaboration**

Building relationships or at least upholding a good working atmosphere through CMC had been experienced as more difficult than expected. It is fair to conclude that this indicates personal contact through CMC was expected as being quite similar or at least comparable to face-to-face interaction:

*“I also understood the role of verbal cues their importance in CMC and of course there is lack of social of cues as compare to FtF communication.” [AG 2].*

Accordingly, there seemed to be no systematic thought or expectation about relationships in CMC, especially because of the lack of awareness about cues missing in CMC and Hyperpersonal Interaction until the course took place:

*“Until now, I have managed virtual collaborations in a subconscious manner which was driven more by instincts. I wasn’t aware that when I was introducing myself to people online, I used to make a selective representation of myself.” [BQ 1].*

*“From my past work experience when I was collaborating with people online, I was hostile to people whose opinion did not confer with the idea’s I held. This in turn made the other participant hostile and the communication quickly descended into a conflict and resulted in a very unfriendly atmosphere.” [BQ 4].*

Due to such previous experiences, some students seemed to be surprised about how well CMC can work, if the scientific basics are considered in practice:

*“Surprisingly this study showed that with a brief introduction of one’s self and the use of social cues in an online setting, people do not require much to interact online and within a reasonable time frame more intimate relationships are formed.” [BD 4].*

### **Theories about the reliability of the technology**

Another mostly negative experience had been in relation to technology and coping with technological issues. This was only mentioned in a negative way. Comments included technology not working properly or causing problems because the platform was uncommon or too complicated for the participants and the tasks given. The importance and dependency on technology in CMC seems to have been underrated because all students mentioned technological challenges in their reports and also stated they were rather disappointed by the reliability of the medium:

*“The technology failure impacted the whole project. We tried to use video conference at the beginning, but it failed. And wigglo couldn’t save our meeting chat log is very annoying. Technology in CMC team work is considered a risk.” [DA 5].*

Therefore, the students seemed to have been expecting the technology to be much more reliable and seamless, finding this issue especially difficult when they were struggling with other problems. The technology seemed to have caused problems, in turn making it difficult to find solutions, due to its limitations. The conclusions about CMC therefore were ambivalent:

*“The Irish team [. . .] had a problem to add contents to the blogs since no one was familiar with the tool. Explaining how-to in a chat is close to impossible since one does not know why the other team is struggling (it does not work since it is not precise enough). [. . .]*

*Using a chat only was a great experience but also quickly showed up some limits” [AH 3].*

### **Assumptions about CMC in general**

In general, some students seemed unaware about the possibilities of CMC beyond relationship building and that it could also be used for professional purposes. Some statements directly admit to have underestimated the possibilities of CMC for professional matters:

*“Initially I thought that computer-mediated communications just allows its users to build relations, to make friendship with others. . .” [AC 1].*

Yet sometimes there was an awareness that remote collaboration could be managed through CMC, with these participants just not knowing how:

*“My initial assumption was that through CMC friendship could be made.”*

*“I never understood how tasks could be done through CMC because in some projects even though all the team members are physically present it is sometime difficult to complete the project. . .” [DC 1-2].*

According to the feedback some participants obviously expected the experience to be more similar than face-to-face, with both negative and positive qualities and outcomes. Others seemed to have not been thinking about CMC before the lesson at all, despite having had some experience with it:

*“So far I did not think more about the pros and cons of the various tools even though I experienced the differences before as well.” [AH 2].*

Consequently 8 students were not expecting that collaborations through CMC could work at all or as well as it was experienced on the course and claimed that it worked better than expected:

*“What I have understood is that if proper planning and structure is provided to CMC meeting even they can be successful.” [DC 2].*

One participant was critical as it took more time than was assumed:

*“after this project I came to know that my assumption is not completely right. It was proved that CMC is also used to do the projects systematically and effectively. [...] On the other hand I came to know that setting up online meeting needs more time when compared to face-to-face meetings.” [AC 1-2].*

Altogether, 8 participants considered CMC as more time-consuming than expected, while only 2 participants called it faster or less time-consuming. This may not be totally surprising, as text-based communication is not as fast as spoken words in face-to-face-settings. However, one student had a quite ambivalent opinion, with statements in both directions, as s/he admitted that “chat as a medium for communication is very slow (. . .) was totally wrong.” Student [BF1] stated that working through CMC in total still “took too much time, to reach the goal. Working together was very inefficient” and participant [BF9] mentioned that his team “lost much more efficiency than I expected.”

*“The chat meetings itself were very inefficient and can be seen as an example of how remote collaboration should not work. [BF 3].*

At the same time, most students seemed quite surprised that working through CMC is more challenging and affords more organizational and management efforts than expected. 5 students claimed that CMC affords better and more organizational management than expected, and 10 out of 17 students found it more challenging than expected, to work or communicate through CMC, especially compared to face-to-face (5 statements):

*“I jumped into the session with almost no preparation. This led to a somehow bumpy start. In the second meeting I used the experience that I’ve made before and prepared documents, structures and examples to guide the session. With this preparation I felt more comfortable and secure and I think the team results were better than in the first session. That’s why I think that a good preparation is even more important for remote collaboration than for face-to-face meetings.” [BJ 4].*

Indeed, this not only addresses the time it takes for chatting, but also the time needed for arranging meeting dates, keeping one another up-to-date in the working process, or distributing roles and tasks. Another issue relating to organizational concerns was in regard to keep track of tasks and the time in the meetings. Some students tended to think of face-to-face as still being easier to handle and or quicker for completing tasks than CMC:

*“I have learned that communicating face to face is much more effective and quicker, on the other side computer-mediated communication took four times more time.” [BN 1].*

Due to this, 5 students claimed that CMC worked not as good as expected, specifically in regard to it being more time-consuming and less effective than expected, as mentioned by 4 of them:

*“With all these technical problems, without knowing each other and without having a deeper understanding of the task, we lost much more efficiency than I expected.” [BF 3].*

The most impact on the views of CMC has been addressed in the practical (23) or combined (12) experiences made during the course, with only 8 statements indicating that the advanced scientific knowledge and theories solely influenced the participants' views.

## Discussion

The discussion of the research findings have been distinguished along the established 4-dimensional scale mentioned in the earlier section, from full approval of participants' lay theories to partial approval to partial disapproval to full disapproval.

### *Previous intuitive lay theories seen as confirmed*

At first, the results show an unambiguous and clear impression. There were no statements which indicate that the lay theories of the participants have been maintained beyond the experiences of the course and have been therefore classified as showing no alteration of the understanding and view of working practices through CMC. This might lead to the conclusion, that whenever the statements allowed an insight into the participants' intuitive/subjective theories on CMC, it became clear that these were not maintained in their entirety. Consequently the results showed an overall impact of the course on these lay theories.

### *Previous intuitive lay theories seen as generally confirmed, but the expectation and understanding of CMC has been extended or improved OR learning something completely new which might had been expected*

The extent of the course's impact in accordance to the categories described shows a more nuanced view. Only 4 (out of 17) students came to the conclusion that their previous assumptions on remote collaboration and computer-mediated communication were completely wrong or disproved by their experiences, which led them to revoking and adjusting their views according to the new insights into the topic. The change in their views were generally relating to speed of communication, value of CMC and a general expectation of remote collaboration.

### *Previous intuitive lay theories seen as generally disproved, with only some expectations confirmed by practice OR by learning something completely new which was unexpected*

The theory about the value of the course was disproved in the response of some students, correcting the estimated importance of knowledge about CMC in general—realizing that contrary to their original belief CMC was relevant to their professional life.

### *Previous Intuitive lay theories seen as completely disproved*

Students expressed surprisingly clearly, how nearly all of their expectations, from the course value to functionality and use of CMC in communication were disproved by the experiences made during the course, which was encouraging.

The majority of the students that participated realized that their views on remote collaboration and CMC was somewhat inaccurate and the project caused them to alter their assumptions due to their experiences. Findings emphasize that lay theories that were developed in a personal CMC environment influence the perception and behavior in task-oriented CMC settings. They furthermore show that these lay theories may change across contexts and over time in unique ways for different individuals. Our course, which used a blended approach of theory and hands-on experience of CMC for future corporate use in an educational setting, facilitated the adaptation of lay theories and was perceived as a fruitful learning experience by the students.

## Conclusion

The research question we hypothesized was to investigate if there occurred or if there was evidence of a change in the participants' understanding of and reflection about Computer-Mediated Remote Collaboration. We wanted to investigate how this works by the occupation with scientific theories of CMC and their practical experiences in conducting a project within student teams through computer-mediated communication.

In concluding we found no cues that might lead to the assumption that the provided scientific theories, sources, and knowledge have been questioned. Nevertheless we are aware that this might be caused by worries the students may have had that their grades would be affected by criticism. Students were advised not be concerned, nonetheless worry and anxiety may have altered the results. Furthermore, we do not claim that the observations and conclusions made in this study have a representative character, we are well aware that our findings are based upon subjective statements, estimations and reasoning about the impacts of the course. However this study provides helpful insight into the widespread and importance of lay theories with regard to CMC remote collaboration and how these are influenced by experiences and knowledge.

Lay theories are not static phenomena or even ideologies, which are defended against external irritation or disapproval. When stressed with non-conformal experiences in practice and provided with additional (scientific) information in an according setting, the participants of our study had little issue in revoking their previous assumptions wherever seemingly inaccurate, according to scientific reasoning and experienced in practice. Not only did the participant's revoke their previous assumptions with regard to remote collaboration and CMC but they also corrected them. This paper, in describing a study within a higher educational setting, adds to the literature and presents results that indicate benefits of teaching how to collaborate remotely, especially where the blended approach of theory and practical application are combined.

## References


- Andersen, R., & Ponti, M. (2014). Participatory pedagogy in an open educational course: challenges and opportunities. *Distance education*, 35(2), 234–249. <https://doi.org/10.1080/01587919.2014.917703>
- Ang, C. S., Talib, M. A., Tan, K. A., Tan, J. P., & Yaacob, S. N. (2015). Understanding computer-mediated communication attributes and life satisfaction from the perspectives of uses and gratifications and self-determination. *Computers in Human Behavior*, 49, 20–29. <http://dx.doi.org/10.1016/j.chb.2015.02.037>
- Carlson, J. R., Zivnuska, S., Harris, R. B., Harris, K. J., & Carlson, D. S. (2016). Social Media Use in the Workplace: A Study of Dual Effects. *Journal of Organizational and End User Computing (JOEUC)*, 28(1), 15–31.
- Chen, K. C., Yen, C. D., Hung, S. Y., & Huang, H. A. (2008). An exploratory study on the selection of communication media: the relationship between flow and communication outcomes. *Decision Support Systems*, 45(4), 822–832.
- Cheney, G., & Ashcraft, K. L. (2007). Considering “the professional” in communication studies: Implications for theory and research within and beyond the boundaries of organizational communication. *Communication theory*, 17(2), 146–175. <https://doi.org/10.1111/j.1468-2885.2007.00290.x>
- December, J. (1996). Units of Analysis for Internet Communication. *Journal of Computer-Mediated Communication*, 1, 0. <https://doi.org/10.1111/j.1083-6101.1996.tb00173.x>

- Dennen, V. P. (2005). From message posting to learning dialogues: Factors affecting learner participation in asynchronous discussion. *Distance Education*, 26(1), 127–148. <http://dx.doi.org/10.1080/01587910500081376>
- Dennen, V. P., Darabi, A. A., & Smith, L. J. (2007). Instructor–learner interaction in online courses: The relative perceived importance of particular instructor actions on performance and satisfaction. *Distance education*, 28(1), 65–79. <http://dx.doi.org/10.1080/01587910701305319>
- Dweck, C. S. (1986). Motivational processes affecting learning. *American Psychologist*, 41(10), 1040.
- Ebersole, S., (2000). Uses and gratifications of the web among students. *Journal of Computer-Mediated Communication*, 6(1), 1–17.
- Ellison, N. B., Gibbs, J. L., & Weber, M. S. (2014). The Use of Enterprise Social Network Sites for Knowledge Sharing in Distributed Organizations: The Role of Organizational Affordances. *American Behavioral Scientist*. <https://doi.org/10.1177/0002764214540510>
- Fiske, S. T., & Taylor, S. E. (2013). *Social cognition: From brains to culture*: Sage.
- Furnham, A. (2013). *Lay theories: Everyday understanding of problems in the social sciences*. Pergamon Press.
- Groeben, N. (2014). *Die Handlungsperspektive als Theorierahmen für Forschung im pädagogischen Feld*. In *Informationsverarbeitung und Entscheidungsverhalten von Lehrern*, M. Hofer Ed. Urban & Schwarzenberg, München, 17–48.
- Groeben, N. & Scheele, B. (2000). Dialogue-hermeneutic method and the research program subjective theories. *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research*, 1(2), Retrieved from <http://www.qualitative-research.net/index.php/fqs/article/view/1079>
- Haridakis, P., & Hanson, G., (2009). Social interaction and co-viewing with YouTube: blending mass communication reception and social connection. *Journal of Broadcasting Electronic Media*, 53(2), 317–335.
- Heider, F. (1958). *The psychology of interpersonal relations*. New York: Wiley.
- Hong, Y. Y., Levy, S. R., & Chiu, C. Y. (2001). The contribution of the lay theories approach to the study of groups. *Personality and Social Psychology Review*, 5, 98–106.
- Howard, C. D. (2011). An instructional paradigm for the teaching of computer-mediated communication. *Instructional Science*, 40(3), 493–513. <https://doi.org/10.1007/s11251-011-9187-0>
- Hunt, D., Atkin, D., & Krishnan, A., (2012). The Influence of computer-mediated communication apprehension on motives for facebook use. *Journal of Broadcasting Electronic Media* 56(2), 187–202.
- Igou, E. R. (2004). Lay theories in affective forecasting: The progression of affect. *Journal of experimental social psychology*, 40(4), 528–534.
- Kaye, B. K., & Johnson, T. J. (2002). Online and in the know: uses and gratifications of the web for political information. *Journal of Broadcasting Electronic Media*, 46(1), 54–71.
- Knight-McCord, J., Cleary, D., Grant, N., Herron, A., Lacey, T., Livingston, T., & Emanuel, R. (2016). What social media sites do college students use most? *Journal of Undergraduate Ethnic Minority Psychology*, 2, 21.
- Kruglanski, A. W. (2013). *The psychology of closed mindedness*. Psychology Press.
- Levy, S. R. (1999). Reducing Prejudice: Lessons From Social Cognitive Factors Underlying Perceiver Differences in Prejudice. *Journal of Social Issues*, 55(4), 745–765.
- Levy, S. R., Plaks, J. E., Hong, Y., Chiu, C., & Dweck, C. S. (2001). Static versus dynamic theories and the perception of groups: Different routes to different destinations. *Personality and Social Psychology Review*, 5(2), 156–168.

- Marsden, N., & Connolly, C. (2010). Pedagogical Patterns for Computer-Mediated Communication. In M. B. Nunes & M. McPherson (Eds.), *Proceedings of the IADIS International Conference e-Learning 2010 (Vol. II)* (pp. 27–32): IADIS Press.
- Mayring, P. (2014). *Qualitative content analysis: theoretical foundation, basic procedures and software solution*. Beltz, Klagenfurt.
- McQuail, D. (2005). *Mcquail's Mass Communication Theory*. London: SAGE Publications.
- Ou, C. X. J., & Davison, R. M. (2011). Interactive or interruptive? Instant messaging at work. *Decision Support System, 52*(1), 61–72.
- Papacharissi, Z., Rubin, A. M. (2000). Predictors of Internet use. *Journal of Broadcasting Electronic Media, 44*(2), 175–196.
- Sheldon, K. M., Abad, N., & Hinsch, C. (2011). A two-process view of Facebook use and relatedness need-satisfaction: disconnection drives use, and connectedness rewards it. *Journal of Personality and Social Psychology, 100*(4), 766–775.
- Sjoberg, U. (1999). The rise of the electronic individual: a study of how young Swedish teenagers use and perceive the Internet. *Journal of Telematics Informatics, 16*(3), 113–133.
- Snyder, M. (1984). When belief creates reality. *Advances in experimental social psychology, 18*, 247–305.
- St. Amant, K., (2002). When cultures and computers collide rethinking computer-mediated communication according to international and intercultural communication expectations. *Journal of Business and Technical Communication, 16*(2), 196–214.
- Sun, S. (2008). An examination of disposition, motivation, and involvement in the new technology context. *Journal of Computers in Human Behavior, 24*(6), 2723–2740.
- Sun, S., Rubin, A. M., & Haridakis, P. M. (2009). The role of motivation and media involvement in explaining internet dependency. *Journal of Broadcasting Electronic Media, 52*(3), 408–431.
- Thompson, E. W., & Savenye, W. C. (2007). Adult Learner Participation in an Online Degree Program: A program-level study of voluntary computer-mediated communication. *Distance Education, 28*(3), 299–312. <http://dx.doi.org/10.1080/01587910701611336>
- Treem, J. W., Dailey, S. L., Pierce, C. S., & Leonardi, P. M. (2015). Bringing Technological Frames to Work: How Previous Experience with Social Media Shapes the Technology's Meaning in an Organization. *Journal of Communication, 65*(2), 396–422. <https://doi.org/10.1111/jcom.12149>
- Walther, J. B. (2013). Commentary: Affordances, Effects, and Technology Errors. *Annals of the International Communication Association, 36*(1), 190–193. <https://doi.org/10.1080/23808985.2013.11679131>
- Walther, J. B. & Parks, M. R. (2002). Cues filtered out, cues filtered in: Computer-mediated communication and relationships. *Handbook of interpersonal communication, 3*, 529–563.
- Walther, J. B., Van Der Heide, B., Ramirez Jr, A., Burgoon, J. K., & Peña, J. (2015). Interpersonal and Hyperpersonal Dimensions of Computer-Mediated Communication. In S. Shyam Sundar (Ed.). *The Handbook of the Psychology of Communication Technology*, First Edition. John Wiley & Sons, Inc.
- Wolfradt, U., & Doll, J. (2001). Motives of adolescents to use the Internet as a function of personality traits, personal and social factors. *Journal of Educational Computing Research, 24*(1), 13–27. <http://dx.doi.org/10.2190%2FANPM-LN97-AUT2-D2EJ>


## Implementing the First Cross-border Professional Development Online Course through International E-mentoring: Reflections and Perspectives

Buddhini Gayathri Jayatilleke , Geetha Udayanganie Kulasekara  &

Malinda Bandara Kumarasinha 

*The Open University of Sri Lanka (Sri Lanka)*

[bgjay@ou.ac.lk](mailto:bgjay@ou.ac.lk), [dgkul@ou.ac.lk](mailto:dgkul@ou.ac.lk) & [mckum@ou.ac.lk](mailto:mckum@ou.ac.lk)

Charlotte Nirmalani Gunawardena 

*University of New Mexico (USA)*

[lan@unm.edu](mailto:lan@unm.edu)

### Abstract

This research paper discusses the accomplishments, issues, and challenges experienced by Open University of Sri Lanka (OUSL) academics when offering the first cross-border professional development online course to train online tutors and mentors. The course was delivered exclusively online and facilitated by OUSL academics and e-mentors from the USA. The course was comprised of 30 participants: 9 from Pakistan, 10 from Mauritius and 11 from Sri Lanka. This qualitative study is based on reflections of both faculty and participants. Data were collected using reflections and informal anecdotal records of the three OUSL academics and self-reflection instruments (pre, mid and final) administered to participants, and reflective journal entries made by participants. Participants' views were triangulated with the reflections of the OUSL academics to validate the results. While there were many accomplishments in the design and delivery of the course, the findings revealed that there were many challenges in implementing the course: pedagogical, organizational and technological aspects in particular. The paper provides recommendations to address such challenges when offering cross-border online courses in the future.

**Keywords:** Reflective practice; Professional development; Cross-border; e-mentoring, Instructional design; Online learning

### Introduction

Rapid developments in Information and Communication Technology (ICT) provide greater access and flexibility to engage in education irrespective of physical location. Higher education institutions around the world have capitalized on this by securing eminent professionals to design and deliver online courses across countries and cultures. However, this context also creates the need for professional development of academics who develop and offer online courses locally, regionally and internationally.

The Open University of Sri Lanka (OUSL) launched its first cross-border professional development online course in 2014 for the participants of three countries: Sri Lanka, Pakistan and Mauritius. This was a novel initiative undertaken by the OUSL academics to offer a capacity building course to develop professional competency in tutoring online courses among academics across three countries. It was an innovative cross-border online course as it:

- used a creative instructional design model Wisdom Communities (WisCom) developed by Gunawardena, Ortegano-Layne, Carabajal, Frechette, Lindemann and Jennings (2006) focusing on community building, knowledge innovation, mentoring, and learner support
- offered exclusively online for a period of 6 weeks for participants across three countries

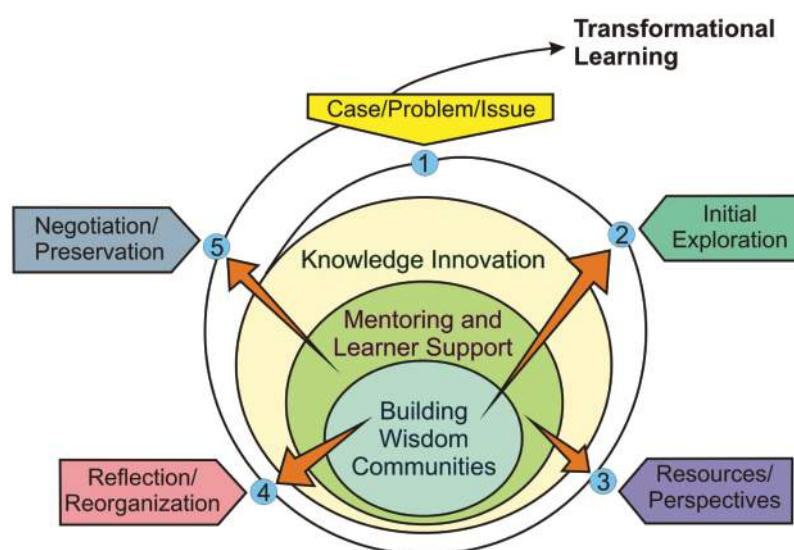


- used international e-mentors from USA to facilitate the inquiry-based collaborative learning process.

This paper reports on the experiences of both OUSL academics and participants with respect to accomplishments, issues, and challenges of delivering the first cross-border exclusively online course by the OUSL. Findings will provide insights and strategies for academics who would like to offer cross-border courses through international e-mentoring.

## Online Design Framework

During the last decade, many educators have attempted to build learning communities in various online contexts based on the fundamental principle that a community-based design will benefit groups of individuals coming together to develop relationships, construct knowledge and engage in meaningful practice (Stuckey & Barab, 2007) and shown the benefits to be derived from online learning communities (Roberts & Lund, 2007). Responding to the need to develop designs to foster learning in online communities, Garrison, Anderson and Archer (1999) developed the Community of Inquiry model by defining three kinds of presence in a learning environment: social, cognitive, and teaching which has been used to both design and evaluate online collaborative learning. Another approach was WisCom (Wisdom Communities) developed by Gunawardena et al. (2006) to build online wisdom communities. Based on socio-constructivist and socio-cultural learning philosophies (Vygotsky, 1978) and distance education principles, the WisCom model was designed to facilitate transformational learning by fostering the development of a wisdom community, knowledge innovation, mentoring, and learner support in an online learning environment. It also promotes a “Cycle of Inquiry” module design, based on Bransford, Vye, Bateman, Brophy and Roselli (2004), work on how people learn. Extending beyond current instructional design practice, WisCom provided both a “new model for teaching” that builds upon the inherent capacity of networked communication to support the growth and intellectual development of communities of practice (Lave, 1991; Wenger, 1998) and a “new model of learning” where learners engage in the process of scholarly inquiry that supports individual and collective learning. WisCom was revised (Frechette, Layne & Gunawardena, 2014) to accommodate cultural inclusivity in online community design. Figure 1 illustrates the WisCom model used to design the professional development learning experience in this study.



**Figure 1: WisCom model with “Cycle of Inquiry” module design  
(Adapted with permission from Gunawardena et al., 2006)**

## The Study and its Context

Having identified the importance of e-learning as a solution for limited higher education opportunities in the country, a series of professional development workshops in online tutoring and mentoring were conducted under the Distance Education Modernization Project (DEMP) of the Ministry of Higher Education in Sri Lanka. The aim of these workshops was to develop the capacity of faculty and other professionals who would be responsible for designing and delivering online courses through the National Online Distance Education Service (NODES). Initially, these workshops were conducted in a blended format with four face-to-face days. These face-to-face sessions were spread across six weeks while the predominant portion of the activities were conducted online. The purpose of having these periodic face-to-face sessions was to take the participants gradually through a teacher centred to a student centred environment enabling the participants to undergo a paradigm shift through a smooth transition from face-to-face to online.

The OUSL purchased this blended programme from the Ministry of Higher Education, updated it by the academics of the Centre for Educational Technology and Media (CETMe) of the OUSL, and offered it as an exclusively online programme to the participants in this study.

### *Transformation of blended course to an exclusively online course*

The original training course was designed based on the Wisdom Communities (WisCom) Instructional Design model (Gunawardena et al., 2006) and the design was retained in this exclusively online course. The learning modules were designed using the cycle of inquiry, starting with a purpose statement and goals, followed by a message from the moderators providing an advanced organizer, leading to a learning challenge for the module which directs learners to learning resources that need to be searched and reviewed before participation in collaborative learning activities (asynchronous/synchronous). The collaborative learning activities provided participants the opportunity to reflect and reorganize their thoughts by negotiating with peers and e-mentors to develop a solution to the Module's learning outcomes. Figure 2 is a screen capture of a sample module to show the WisCom instructional design.



**Figure 2: Screen capture of a sample module**

Since all the modules were relevant and appropriate, the contents of all the modules were kept unchanged. However, some of the web resources were replaced due to the unavailability of the original resources. Additional learning resources such as screen casts for navigation, user log-in etc., study guides and guidelines for chat sessions were prepared to replace the four face-to-face sessions in the original training course, fostering independent learning. Even though the original blended course was transformed to an exclusively online course, the duration of the training course was kept at six weeks.

This course comprised of 14 modules using MOODLE (Table 1) as the Virtual Learning Environment (VLE) and adopted the WisCom instructional design. The learning experience starts with a learning challenge after allowing the learners to go through the purpose and the message by the facilitator and lead to resources and then to learning activities. Reflective journals were included in each module and were considered as part of the evaluation. Specific guidelines were provided to write reflective journals. In addition, variety of e-activities have been incorporated in the course such as asynchronous/synchronous discussions, quizzes, peer evaluations, online simulations to expose the learners to show the availability of different strategies/techniques and how to use them appropriately and, to motivate them to engage in the course. The final evaluation was based on three tasks in each module, specific individual/group assignments; participation in e-activities; and reflective journal entries.

The course was facilitated by three academic members of the OUSL in collaboration with four e-mentors from the USA. While the OUSL academic members facilitated the overall online learning experience, each international e-mentor was assigned one small group and was expected to promote inquiry-based learning through collaboration to achieve group goals.

**Table 1: Overview of the modules of the online course**

Module No.	Title	e-activities	Assignment
	Pre-course activities	Forum Pre course self-reflection instrument Reflective Journal	Individual
1	Paradigm shift to online tutoring/ facilitating/moderating	Forum Reflective Journal	-
2	The role of an online tutor mentor and necessary skills and qualifications	Chat Forum Quiz Reflective Journal	-
3	Building an online learning community and creating the social environment	Reflective Journal	Individual
4	Facilitating Interaction	Reflective Journal	Individual – 3
5	Collaborative learning and team building online	Reflective Journal	Individual
6	Facilitating knowledge construction	Forum Reflective Journal	
7	e-Mentoring	Forum WIKI Pre and Post questionnaire on cross cultural e-mentoring Reflective Journal Mid course self-reflection instrument	Group
8	Providing Learner Support	Reflective Journal	Individual
9	Orienting students to online learning	Quiz Reflective Journal	

Module No.	Title	e-activities	Assignment
10	Assessing Learning & Providing Feedback	Forum Reflective Journal	individual
11	Conducting Practical Course Components at a Distance and Virtual Labs	Online simulation Forum Reflective Journal	-
12	Cultural Issues Related to Learning and Communication	Forum Quiz Reflective Journal	Individual and Group
13	Ethics of Online Learning	Forum Reflective Journal	
14	Monitoring and Evaluating Tutors/ Mentors	Forum Reflective Journal Final course self-reflection instrument	

The following research questions guided this study:

- What were the major achievements of the cross-border online course from the reflections and perspectives of participants and OUSL academics?
- What were the issues faced by participants and OUSL academics when engaging in a cross-border online course?
- What were the major challenges faced by OUSL academics when implementing the cross-border online course with international e-mentoring?

## Methodology

### *Research design and methods*

We employed a qualitative research design as our primary intent was to determine participant perspectives on their engagement in this cross-border online learning experience. As researchers and designers our predominant philosophical approach was pragmatic (Creswell, 2014) as we wanted to explore the results of our online design on the learning process. As Creswell has observed, pragmatists look at applications—what works, and solutions to problems and employ many approaches for collecting and analyzing data rather than subscribing to only one way. As pragmatists, we focused on reflective practice, both “reflection-on-action” and “reflection-in-action” using reflections from participants and OUSL academics who led the learning experience. Reflective practice, reflexivity and first person inquiry are widely used in research in order to understand the process of “learning through” and “from experience” towards gaining new insights of self and/or practice (Boyd & Fales, 1983; Jarvis, 1992). The purpose is to critically examine current practice to gain new understanding to improve future practice. The concept of ‘reflective practice’ was driven by Dewey’s ideas and was later influenced by the work of Schon’s (1983) *The reflective practitioner: how professionals think in action*. His main concern was to facilitate the development of reflective practitioners through two types of reflections: “reflection-on-action” (after-the-event thinking) and “reflection-in-action” (thinking while doing) so that professionals could become aware of their implicit knowledge, learn from their experience and implement the necessary changes into current practice.

Data were collected using three methods at different stages of the 6-week period. These methods included:

- (1) The three OUSL academics' reflections and informal anecdotal records on participants' online behaviours. They critically evaluated their own learning experiences and their own context and reflected on the challenges faced by them in administering the first cross-border course.
- (2) Reflections of participants from three different countries; Sri Lanka, Pakistan and Mauritius gathered through self-reflection instruments administered at the beginning, middle, and end of the course, and
- (3) Personal self-reflections in Reflective Journals that captured participants' experience engaging in a cross-border online course. Participants views were triangulated with the reflections of the OUSL academics to validate the results. Content analysis was used to identify categories and themes (Patton, 1990). Content analysis of the data from both OUSL academics and participants indicated the emergence of several similar categories and themes.

## Results and Discussion

### *Profile of respondents*

There were 30 professionals enrolled in the cross-border online professional development course; 9 from Pakistan, 10 from Mauritius and 11 from Sri Lanka. They were mostly academics from national universities in their respective countries. In this sample 16 were females (53%). Age ranged between 25 years to 60 years, and the majority were in the 25–29 years age group (30%), followed by the 30–35 age group (22%).

15 responded to the mid course self-reflection instruments, and 13 responded to the final course self-reflection instruments. Thus, the response rate for the mid course self-reflection instrument was 50% and 43% for the final course self-reflection instrument.

Only 10 were successful in completing this course; one was certified as a master trainer and the remaining 9 were certified as online tutors. Out of these 10 successful completers, eight were females including the master trainer.

Three OUSL academics were responsible for updating the course design and delivery of the course. They also functioned as local e-mentors. Out of the three OUSL academics; two were female and one was male. Three graduate students (two female and one male) from a U.S. university functioned as e-mentors to facilitate group discussions and mentor the groups to achieve group goals. One faculty member from the U.S. who designed and developed the initial course participated as a guest to facilitate specific online discussions.

When reflections of participants and OUSL academics were analysed using an interpretive and iterative approach (Ely, Vinz, Downing & Anzul, 1997), three main categories were identified; pedagogical learning experiences in the course and associated issues, as well as organizational and technical issues when implementing the course. These are discussed under the following three sections.

### ***What were the major achievements of the cross-border online course from the reflections and perspectives of participants and OUSL academics?***

This section reports on the reflections and perceptions of participants with respect to their learning experiences in various aspects of this course, starting with the pedagogical aspects of this online course. Their views were triangulated with the reflections of OUSL academics.

All participants who responded to the final course self-reflection instrument indicated that they achieved the learning outcomes of this training course (46% strongly agreed). Further analysis revealed that the course syllabus was very clear to get the overall picture of the course (100%), sufficient examples were integrated into the course to illustrate concepts or issues (100%), learning experiences were presented in a well structured format (100%), learning activities were useful in comprehending the course content (100%) and instructions were very clear in all assignments (100%). Almost all the participants referred to the relevant learning resources and discussed them in the forum posts (92%) implying that the learning resources were appropriate and useful for knowledge building. All participants were very satisfied with the instructional design of the course.

Regarding collaborative learning activities in the course, all participants expressed satisfaction with the knowledge construction process through collaborative learning and felt that the local e-mentor (OUSL academic) encouraged groups to work collaboratively to achieve the group goal (100%). Participants acknowledged their own contributions to the group task (100%), noted their ability to manage discussions among a group of diverse learners (100%), encouraged the group to value other points of view (100%) and learned how to conduct an interactive learning experience online (100%). However, some participants commented that they would have liked to receive more timely support from international e-mentors. This may have been due to the delayed response they received due to the time difference, or a lack of response.

**Table 2: Course Achievements and Pedagogical Aspects**

Theme	Supportive quotations
Overall satisfaction (100%)	<p><i>I would say all. The content helped me to expand my knowledge of what online learning entails, the role of mentors and what we need to support learners in an online environment. The challenges and obstacles faced, helped me to understand things from the student's perspective, as well as gain insight and understanding on how to handle issues and problems as a tutor in the online environment (Mid course self-reflection, Sri Lankan Female 1).</i></p> <p><i>This is probably the last week of the course and time to say goodbye to each other. I am not writing " Goodbye" in its true sense, this is just coming out of scheduled online activities, otherwise it is actually start of friendship of a new inter country Community. We will cherish the memories of this period for long time and will remain in touch with each other. . .In other words it is beginning of the new "Online" Culture (Last week entries of the Reflective Journal – Pakistani Female 1).</i></p>
Instructional design of the course (100%)	<p><i>I like the use of three orientation modes of each module i.e. Purpose of the course, tutor's message and the learning challenge. Instead of mixing up all three in one document it is a nice way of explaining expected outcomes and experiences designed in each module (Mid course self-reflection – Pakistani Female 2).</i></p>

All participants felt that the online comments received by peers helped them to learn (100%) and said they experienced a sense of togetherness with them (92%). These results indicate that the instructional design based on the WisCom model, along with the mentoring and facilitation by OUSL academics and e-mentors created a learning community among a diverse group of participants. These participants were also satisfied with their learning experience in this cross-border course. Table 2 shows reflective comments that support this view.

### ***What were the issues faced by participants and OUSL academics when engaging in a cross-border online course?***

Table 3 provides insight into the issues faced by participants and OUSL academics which are discussed below.

One of the major issues mentioned by participants was lack of participation and peer support during group tasks which made it difficult to achieve group goals. Reflections of the OUSL academics also revealed that they felt the difficulty participants had in engaging in e-activities as most of them were not meeting the deadlines as planned. Since this was one of the first online collaborative learning experiences for participants, many had difficulty understanding the requirements of group collaboration which should be addressed in an orientation session prior to the course in future offerings. Perhaps the international e-mentors should also be aware of this difficulty and pay special attention to facilitating group collaboration.

Another associated issue was workload. Only 54% stated that they kept up with the workload and most of the reflections clearly showed the difficulty that the participants faced during this course with respect to the workload (Table 3). Hence, in most occasions the academics had to rearrange some of the original modules; moving modules with demanding tasks with the modules with less demanding tasks to balance the workload while delivering the course. However, still most of the participants did not participate in a timely manner and they had to reschedule activities regularly. Rearranging modules affected both the academics and the participants especially the active participants who had already completed their activities and were eagerly waiting to start the next module. Therefore, the actual time period to complete the course was seven weeks even though the expected time period was six weeks. Fleck (2012) reported that, in many instances, the workload dimension and its distribution over the various activities is often neglected by the designers/developers.

Though the workload was an issue most of the participants found the course interesting. One participant suggested ways of improving the course.

*I feel that the workload per week could be decreased, since most of the participants are engaged full-time in other academic activities. The content of the course is great, since all of the information presented is very pertinent to the training of mentors and facilitators. So rather than deleting any modules, I suggest that the number of modules given per week should be reduced to about 2 per week. This will give opportunity for participants to engage sufficiently with all the readings and the assignments for each module. Even though this would mean that the number of weeks for the course will be extended, I think this would produce better quality work (Final course self-reflection – Sri Lankan Female 1).*

Findings also revealed that many participants were not comfortable in engaging multiple tasks at one time and preferred a linear structure. Research also showed that eastern learners find it difficult to engage in non-linear online courses (Ku & Lohr, 2003) and may experience “temporal culture shock” when they encounter online learning for the first time (Leeds, 2014) and prefer “monochromic” approach (doing one thing at a time) than “polychromic” approach (doing more than one thing at a time or in parallel).

Some participants noted the need for a higher sense of social presence (Gunawardena, Flor, Gomez & Sanchez, 2016) or connection to other participants and the OUSL academics by the exchange of photographs. One of the design techniques adopted was to share only images that represented the participants rather than photographs as in certain cultures, people do not like to share photographs with people they do not know as an image represents their identity. Also, sharing photographs may indicate social status differences, which might be a challenge for equalizing the online learning environment in high power distance cultures where power is unequally distributed.

Directions for participant introductions requested that participants share an image that represented them and say why it represented them rather than post a photograph. Participant requests for photographs indicate that for some participants photographs can create a closer sense of the other and should be considered as an option in future online learning designs (see Table 3).

One other major concern noted by OUSL academics and some of the participants was that certain participants were not very concerned about plagiarism and copyright laws and were directly copying the content from the Internet as seen in the quote in Table 3. This may be because participants did not know copyright regulations or were unaware of the gravity of the issue, or, did not have adequate time to rephrase the content.

Many of the issues discussed above point to the need for a well designed orientation to the course prior to offering the online course. The orientation needs to focus on how online learning happens, how social presence and community can be created, the dynamics of online collaboration and teamwork, how to manage information and workload, how to navigate the course, and how to abide by copyright laws. This orientation would be in addition to the current pre-course activities that help participants to navigate the course.

**Table 3: Issues Faced by Participants and OUSL Academics**

Theme	Supportive quotations
Lack of Peer support for group tasks	<p><i>It is not easy to produce a group work in online as some students pay less attention to the target and do what they want even under good online background. Some are not collaborative and aim mostly their individual targets. Some are difficult to negotiate (Final course self-reflection – Sri Lankan Female 2).</i></p> <p><i>A bit frustrated again since the only group member who is at least a little responsive, just directly wrote to the moderator and then only just responded to what was said by the moderator, ignoring that this is a group activity and we all need to be involved (Journal Reflections week 3 – Sri Lankan female 1)</i></p> <p><i>Our e-mentoring sessions were not very useful in getting a true sense of online collaboration – (Final course self-reflection – Sri Lankan Male 1).</i></p>
Workload	<p><i>I think the workload is high. It was difficult to manage 3 modules in one week with other commitments in work place and home (Final course self-reflection – Sri Lankan Female 2).</i></p> <p><i>Online learning means a lot of commitment and planning. I didn't realize how time consuming it can be (Mid course self-reflection – Mauritius Female 1).</i></p>
Difficulty in navigating multi structures	<p><i>Many activities going simultaneously made me feel uneasy (Mid course self-reflection, Pakistani Female 2)</i></p>
Social Presence	<p><i>I would like to see photographs of OUSLEL team especially X . . . who was constantly with us throughout the course. Seeing and believing is different than just believing without seeing. . . (Final course self-reflection – Pakistani Female 1).</i></p>
Less sensitive to Plagiarism and copyright laws	<p><i>Only a handful of group members brought original thinking to the activities. Most were content with copying something directly from the web. Rather than collaborating, it was a task of gluing together individual write-ups (or content pilfered from the web) – (Final course self-reflection – Sri Lankan Male 1).</i></p>



### ***What were the major challenges faced by OUSL academics when implementing the cross-border online course with international e-mentoring?***

The main challenges faced by the OUSL academics were related to organisational and technical issues. The next section will first discuss the organisational issues followed by technical issues.

Administration and logistic issues related to prior registration—Since this course was an online course all the promotional activities were carried out using the web and email. The interested applicants had to register online using a form and payments using the online payment gate way, This facility was available only to the local applicants. However, the online payment gate way was not functioning as expected and it was brought to our notice by a potential participant. Alternative arrangements had to be taken immediately by the lead OUSL academic with constantly liaising with relevant divisions and personnel. As this was the first time that the OUSL embarked on offering cross-border online courses, the mechanisms for online registration, payments and support mechanisms presented challenges. These procedures need to be established, streamlined and automated.

Constant communication had to be made with potential participants especially with country coordinators of international participants, clarifying their queries regarding course enrollment. All these administrative functions were carried out by the lead OUSL academic as there were no established mechanisms to liaise with international participants including their registration and payments, unlike in standard degree programmes at the OUSL. Therefore, the lead OUSL academic had to carry out all these administrative functions in addition to modifying the existing course, and other regular job duties. Lessons learned will provide a foundation for streamlining the process when cross-border programs are offered in the future.

Administration and logistic issues during the course—Although nominations were received on time and participants were given clear instructions to register before the said date, some international participants registered at different time intervals during the first week. Therefore, the deadlines had to be extended in order to accommodate late registrants to engage in pre-course activities and become familiar with the online course. Extending deadlines affected the smooth flow of the course as the course was structured to be offered on a weekly basis. Several local participants were frustrated by this as they had already completed their week's activities. This was reflected in their final course self reflection and also in their reflective journal quoted below.

*The running of the course was chaotic. This was due to the reason that new entrants were admitted to the course even after its commencement. This lead to the dissimilar deadlines and confused some participants (Final course self-reflection – Sri Lankan Male 1).*

In addition, participants had to be regularly reminded to participate in online activities as most of the activities were collaborative in nature.

*I had to take immediate measures to make the participants engage in online activities and to encourage them to come online. I used announcements, messaging facility in the moodle, email (personal, official and especially created email for this course), individual and group mails and most of the time I was not successful. So I didn't have any other alternative than extending the deadlines (OUSL academic 1).*

Liaising with cross cultural e-mentors was carried out through email messages indicating when to participate in the discussions. They were involved only in the e-mentoring module to demonstrate e-mentoring which was scheduled for weeks 3,4 and 5. Owing to the time difference between Sri Lanka and USA, communication was a challenge; and sometimes responses from the e-mentors were delayed. Thus, the OUSL academics had to step in and send emails to e-mentors requesting them to participate in the forum discussions. The same procedure was used with the international participants from Pakistan and Mauritius.

The OUSL academics had to make timely decisions with regard to technical, administrative and organizational issues while carrying out academic work related to this course. It was a very demanding

and challenging exercise for them. Since this was the first cross-border course offered by the OUSL, many initiatives had to be taken by the organization with respect to operational requirements; technology infrastructure in particular. Some of the issues pertaining to the organization were brought to the notice of the relevant authorities, without much success and academics felt they should have received more support and encouragement from the institution. As stated by Fleck (2012, p. 406) “Technology mediated systems are more “brittle” than human-mediated systems” and requires a range of protocols and processes. Ettinger, Holton and Blass, (2005), reported organizational support as one of the critical factors in the success of e-learning. Taylor (1998), pointed out that the ‘*lone rangers*’ of many universities who are individual practitioners developing innovative online teaching and learning products remain at the level of specific course offerings, due to a lack of institutional support and a failure to institutionalise inventive practice. Even Hough, McNaught and Schaik (1998) stressed that people within these organizational structures systematically resist attempts to alter their routines and their control over specific tasks.

Technical issues encountered at the development phase: Reflections by the OUSL academics—the transformation of the original blended course from a ‘course backup’ file to an exclusively online course was a daunting task. It had to be reloaded to the NODES server; re-linking and re-checking the links, creating new resources for the unavailability of the original resources, creating new e-activities for replacing face-to-face activities while adapting the course to an exclusively online version. The extreme slowness in accessing the course via a server housed in a national site with limited controls for the OUSL web administrator caused many challenges and frustrations for the OUSL academics. Hence, the time taken to transfer and modify the content took more time than anticipated.

The situation was exacerbated with the breakdown of the NODES server just one day prior to the commencement of this online course. Fortunately, one of the OUSL academic members had the access rights to the original course when it was originally offered by NODES. Hence, a prompt decision was taken after consulting the university authorities to offer this course using the OUSL server which was dedicated only to online course development and in-house training. However, direct reloading of the course backup from the NODES server to the OUSL server was not technically feasible due to the incompatibility of the two installed versions of the Learning Management System (LMS). Therefore, OUSL academics had to copy the entire content of all the modules and readjust all the links to the OUSL server while undergoing several interruptions. Copying of the entire course was made possible at the last minute as the sole responsibility of administering the local server was managed by the one of the OUSL academics in the CETMe. Hence the course team; three academics and one technical assistant were given the course creation rights immediately. Confronting all these technical challenges, OUSL team managed to complete the ‘Pre course activities’ and the first module of the course which were assigned for the first week, and launched the course on time. One of the factors that contributed for the launching of the course on time was that the three academic staff members were very conversant with the LMS and they had the necessary technical skills so that they managed to find alternative methods and strategies to overcome technical issues. Many studies have reported that the successful offering of online courses depend on the technical role of the online teachers (Anderson, Rourke, Garrison & Archer, 2001; Aydin 2005; Berge, 1995; Varvel, 2007). This study also showed the importance of the technical role of online teachers.

One of the OUSL academics members related her experience as follows:

*Accessing the local server was more flexible than NODES as lesser number of users were accessing the site. User profiles for students were created and the login credentials were emailed on time. Team spirit was at a maximum in getting back the course. Everybody was supportive, flexible and enthusiastic in offering the first international online course, while reminding of the famous English expression ‘when the going gets tough, the tough get going’- OUSL academic 2.*

Technical issues encountered at the delivery phase: Reflections both by the OUSL academics and participants—Connectivity was a source of concern for both the participants and the academics.

*oh dear! just completed an assignment and saved it and lost it – travails of online work. Can be extremely frustrating; and I can imagine how students may feel . . . discouraged.*

*I think online learning is actually very challenging especially if you are not technically savvy. I think the transition from traditional forms of learning to online learning will take time. . .(Reflective Journal Week 4 – Sri Lankan Female 4)*

Andersson (2008) also found connectivity or the access issue a major challenge for e-learning in Sri Lanka, in a case study carried out on the eBIT course in Sri Lanka. Online access seemed to be a major challenge for both international and local participants. This issue surfaced during a chat session when participants from Pakistan and Mauritius reported frequent interruptions due to power failure, poor band width and/or internet connections. The following quotation from a participant in Pakistan clearly illustrates this difficulty.

*The only thing which frustrated me was discontinuation of power supply when I was at the verge of submitted anything created with so much effort. This probably is our national problem and nothing to do with this course. It can be a food for thought for the facilitators to develop some strategy for such issues in online teaching. (Mid course self-reflection – Pakistani Female 1).*

Gulati (2008) also reported similar challenges faced by developing countries when attempting to make learning more accessible to a learner through using Internet technologies. Expanding online education in developing countries still is a source of concern and not fully successful, possibly due to the governments' and institutions' failure to recognize and address the access issues pertaining to online learning. However, it has a tremendous potential to meet the educational needs of the masses.

## Conclusion and implications

Reflections of both the participants and the academics showed the challenges faced by both parties when engaging in a cross-border course delivery and how it affected participant satisfaction. The main challenges were technical issues related to access to technology, connectivity and regular power failure which are common issues experienced across these three developing countries. Limited peer engagement, delayed responses from the international e-mentors, plagiarism and workload were the main pedagogical issues observed in this online course. Lack of support structures for online learning in the institution were the main hindrances faced by the OUSL academics in delivering this course. Therefore, establishing policies, formulating procedures and guidelines, providing adequate support structures to 'lone learners' and freeing them from administrative and technical tasks are essential in order to deliver cross-border courses successfully, and to sustain engagement in innovative teaching practices by the faculty.

We offer the following recommendations based on our findings implementing cross-border online courses.

- plan activities well ahead of time and see whether you have adequate organisational support (human resources, both administration and technical professionals, technological infrastructure and facilities etc., established mechanisms) from the management to implement cross-border online courses
- plan alternative strategies as safety measures as cost, dependability and speed of access to the Internet, and even access to electricity is less than desirable in many countries
- the course based on the WisCom design model was fully accepted across three cultures implying that learners enjoyed interacting with each other and learning from each other as part of a learning community. All learners in this study prefer to have a structured format,

clear instructions on navigation and e-activities, problems posed as a learning challenge, and fora for knowledge construction through negotiations with peers and tutors so that they build learning communities and gradually develop their own wisdom and potential. However, workload was an issue and needs to be addressed.

- provide a linear structure with one activity (monochromic) at a time than a multi structure with multiple tasks ( polychromic)
- conduct a pilot run with a group of learners before launching the course to determine the workload
- allow adequate time to complete activities and a grace period before starting a new module to allow all the participants to complete the entire module
- engage in briefing sessions with international e-mentors to identify gaps so that they can “build bridges” (Rogers *et al*, 2007) to facilitate cultural differences
- provide guidelines on plagiarism and copyright
- conduct a comprehensive orientation program prior to the course to orient participants to online learning

In summary, the recommendations raised in this study provide valuable insights that can be used to assist distance educators and policy makers when delivering similar cross-border online courses in the future. This study was based on a small sample of participants from three Asian countries. Therefore results maybe trustworthy only in similar contexts.

## Acknowledgements

We are grateful to the local and international participants, international e-mentors and Mr M B Vaidyashekhare for designing graphics.




## References

- Andersson, A. (2008). Seven major challenges for e-learning in developing countries: Case study eBIT, Sri Lanka. *International Journal of Education and Development using ICT (IJEDICT)*, 4(3), 45–62. Retrieved from <http://ijedict.dec.uwi.edu/viewarticle.php?id=472&layout=html>
- Anderson, T., Rourke, L., Garrison, D. & Archer, W. (2001). Assessing teaching presence in a computer conferencing context. *Journal of Asynchronous Learning Networks*, 5(2), 1–7.
- Aydin, C. H. (2005). Turkish mentors' perception of roles, competencies and resources for online learning. *Turkish Online Journal of Distance Education–TOJDE*, 6(3), 58–80. Retrieved from <http://tojde.anadolu.edu.tr/tojde19/index.htm>
- Berge, Z. (1995). The role of the instructor /facilitator. *Educational Technology*, 35(1), 22–30.
- Boyd, D. & Fales, A. (1983). Reflective learning: key to learning from experience. *Journal of Humanistic Psychology*, 23(2), 99–117.
- Branford, J., Vye, N., Bateman, H., Brophy, S. & Roselli, B. (2004). Vanderbilt's AMIGO project: Knowledge of how people learn enters cyberspace. In T. M. Duffy & J. R. Kirkley (Eds.). *Learner-centered theory and practice in distance education: Cases from higher education* (pp. 209–234). Mahwah, NJ: Lawrence Erlbaum Associates.
- Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (4th ed.). Los Angeles: Sage.
- Ely, M., Vinz, R., Downing, M. & Anzul, M. (1997). *On writing Qualitative Research: Living by words*. London: Falmer Press.
- Ettinger, A., Holton, V. & Blass, E. (2005). E-learner experiences: learning from the pioneers. *Industrial and Commercial Training*, 37(6), 286–290. <https://doi.org/10.1108/00197850510617550>

- Fleck, J. (2012). Blended learning and learning communities: opportunities and challenges. *Journal of Management Development*, 31(4), 398–411. <http://dx.doi.org/10.1108/02621711211219059>
- Frechette, C., Layne, L. C. & Gunawardena, C. N. (2014). Accounting for culture in Instructional Design. In I. Jung & C. N. Gunawardena C. N. (Eds.). *Culture and Online Learning: Global Perspectives and Research* (pp. 54–66). Sterling, VA: Stylus.
- Garrison, D. R., Anderson, T. & Archer, W. (1999). Critical inquiry in a text-based environment: computer conferencing in higher education. *The Internet and Higher Education*, 2(2–3), 87–105. [http://dx.doi.org/10.1016/S1096-7516\(00\)00016-6](http://dx.doi.org/10.1016/S1096-7516(00)00016-6)
- Gulati, S. (2008). Technology-Enhanced Learning in Developing Nations: A review. *The International Review of Research in Open and Distributed Learning (IRRODL)*, 9(1). Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/477/1012>
- Gunawardena, C. N., Flor, N. V., Gomez, D., & Sanchez, D. (2016). Analyzing social construction of knowledge Online by Employing Interaction Analysis, Learning Analytics, and Social Network Analysis. *The Quarterly Review of Distance Education*, 17(3), 35–60.
- Gunawardena, C. N., Ortegano-Layne, L., Carabajal, K., Frechette, C., Lindemann, K. & Jennings, B. (2006). New Model, New Strategies: Instructional design for building online wisdom communities. *Distance Education*, 27(2), 217–232.
- Hough, G., McNaught, C. & Van Schaik, L. (1998). Developing a faculty plan for flexible delivery for the next five years – and how to get there. In Corderoy, R. M. (ed). *Flexibility: The Next Wave? Proceedings of ASCILITE'98*, University of Wollongong (pp. 339–346).
- Jarvis, P. (1992). Reflective practice and nursing. *Nurse Education Today*, 12(3), 174–181.
- Ku, H. & Lohr, L. L. (2003). A case study of Chinese students' attitude toward their first online learning experience. *Education Technology Research and Development*, 51(3), 94–102.
- Lave, J. (1991). Situating learning in communities of practice. In L. B. Resnick, J. M. Levine, & S. D. Teasley (Eds.). *Perspectives on socially shared cognition* (pp. 63–82). Washington, D.C.: American Psychological Association.
- Leeds, B. (2014). Temporal experiences of e-learning by distance learners. *Education+Training*, 56(2/3), 179–189. <http://dx.doi.org/10.1108/ET-11-2012-0114>
- Patton, Q. M., (1990). *Qualitative Evaluation and Research Methods* (2<sup>nd</sup> Ed.). Newsbury Park, London: Sage Publications Inc.
- Roberts, E., & Lund, J. (2007). Exploring eLearning community in a global postgraduate programme. In R. Andrews, & C. Haythornwaite (eds). *The Sage Handbook of eLearning Research* (pp. 487–503). London: Sage.
- Schon, D. A. (1983). *The reflective practitioner: How professionals think in action*. New York: Basic Books.
- Stuckey, B. & Barab, S. (2007). New conceptions for community design. In R. Andrews & H. Caroline (Eds.). *The SAGE handbook of e-learning research* (pp. 439–465). London: Sage Publications Ltd.
- Taylor, P. (1998). Institutional change in uncertain times: lone ranging is not enough. *Studies in Higher Education*, 23(3), 269–278.
- Varvel, V. E. (2007, Spring). Master online teacher competencies. *Online Journal of Distance Learning Administration*, 10(1). Retrieved from <http://www.westga.edu/~distance/ojdl/spring101/varvel101.htm>
- Vygotsky, L. S. (1978). *Mind in society: the development of higher psychological processes*. In M. Cole, V. John-Shteiner, S. Scribner & Souberman (Eds.). Cambridge, MA: Harvard University Press.
- Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*. New York: Cambridge University Press.

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

## A MOOC approach for training researchers in developing countries

Ravi Murugesan , Andy Nobes  & Joanna Wild   
*INASP (United Kingdom)*

[rmurugesan@inasp.info](mailto:rmurugesan@inasp.info), [anobes@inasp.info](mailto:anobes@inasp.info) & [jwild@inasp.info](mailto:jwild@inasp.info)

### Abstract

We report on an online course in research writing offered in a massive open online course (MOOC) format for developing country researchers. The concepts of cognitive presence, teacher presence, and social presence informed the design of the course, with a philosophy of strong social interaction supported by guest facilitators. The course was developed with low-bandwidth elements and hosted on a Moodle site. It was offered twice as a MOOC and 2830 learners from more than 90 countries, mainly in the developing world, took part. The average completion rate was 53%. Female learners and learners who were active in the forums were more likely to complete the course. Our MOOC approach may be a useful model for continuing professional development training in the developing world.

**Keywords:** MOOC; higher education; researchers; developing countries; continuing professional development; Moodle

### Introduction

Knowledge advances through scholarly research, and communication is essential for this advancement to happen. However, researchers in developing countries face multiple challenges in publishing their work in peer-reviewed journals: they often lack access to mentors, have limited opportunities for research funding, have poor access to literature (Nchinda, 2002), and lack training in research writing skills (Langer, Díaz-Olavarrieta, Berdichevsky & Villar, 2004). There is a basic “information inequality” in knowledge of publishing practices (such as open access), international ethical standards, and exploitative practices such as so-called “predatory journals” (Jones, 2015). Researchers in the Global South may be detached from the information-rich dialogues on scholarly publishing that tend to take place in the North (Nobes, 2016a). Despite lacking access to continuing professional development (CPD) training in research communication, developing country researchers are driven by the same “publish or perish” culture as in developed countries, and they remain acutely aware of the importance of scholarly research on their countries’ development.

In 2006, the AuthorAID concept was developed to bridge the publishing gap between the developed and developing world (Freeman & Robbins, 2006). Since then, the AuthorAID project at INASP, an international development charity in the UK, has supported developing country researchers through mentoring, training workshops, online courses, e-resources, and institutional partnerships (Nobes, 2016b). In 2011, our pilot online course in research writing was successfully offered to a group of 28 Rwandan researchers with a 90% completion rate (Murugesan, 2012). During 2012 and 2013, we saw a steady increase in the demand for this course. In 2014 and 2015, we ran the course for 267 and 356 learners, respectively. Over this period, we began to notice that the gender balance among learners in our online courses was consistently better than what is typical at face-to-face workshops we support in developing countries, in which female researchers are often underrepresented. A participant of an AuthorAID course in 2013 commented that online training may

be especially accessible for women: “Women have multiple responsibilities with work and family. Sometimes they can’t think of taking time away from their job and their children” (Owens, 2013).

In 2015, seeing the rapidly increasing demand for training in research writing from developing countries and their accessibility for both male and female researchers, we were encouraged to develop a massive open online course (MOOC) approach.

There is already some evidence that researchers are more likely than the general population to be participants of online courses and MOOCs. For example, Aboshady et al. (2015) found a high awareness of MOOCs in a survey of Egyptian medical students: 30% had enrolled in at least one MOOC. Research on MOOCs in developing country contexts is, however, sparse (Castillo, Lee, Zahra & Wagner, 2015) and mostly limited to participation of developing country users in western MOOCs (Garrido et al., 2016; Christensen et al., 2013; Ho et al., 2015), where there tends to be low participation from Asia and especially Africa (Liyanagunawardena, Williams & Adams, 2013). We know, however, that developing country participants are generally more likely to complete MOOCs compared to those from developed countries (Garrido et al., 2016), especially when learning specific job skills (Christensen et al., 2013).

There have been some efforts to adapt western MOOCs to developing country audiences following the realisation that high-bandwidth elements such as video lectures are not practical and existing platforms need to be “open-sourced” for adaptation (Lieber, 2013). However, MOOC usage can be restricted by poor infrastructure as highlighted by Liyanagunawardena et al. (2013), who notes that even when there is access to good Internet connectivity, poor digital literacy skills pose a barrier. The problem is intensified when online courses and MOOCs use high-end technology (Warusavitarana, Lokuge Dona, Piyathilake, Epiawela & Edirisinghe, 2014).

The early promises around MOOCs focused on their potential to democratise education and reach people with limited learning opportunities. However, it soon became obvious that this ambition could not be realised with a “one-size-fits-all” MOOC approach, that is, without (1) taking into account the learners’ circumstances and the context in developing countries; (2) providing little or no guidance and support for the learners (Patru & Balaji, 2016); and (3) considering language challenges (Liyanagunawardena et al., 2013). MOOC providers need to adapt to the cultural contexts and needs of users (Castillo et al., 2015; Daniel, Vázquez & Gisbert, 2015), but it is not yet known what pedagogical approach is most effective—we are very much in an “experimental phase” for MOOCs in developing countries (Wildavsky, 2015).

To design the AuthorAID research writing MOOC for audiences in developing countries, we were guided by the pedagogical model developed by Garrison (2007) and our organisational knowledge of the socio-political and cultural contexts of researchers in developing countries in Africa and Asia. In this paper, we explain (1) the approach that guided course design and development; (2) the rationale behind the choice of technology, content, and methods to support interaction; (3) how we implemented the course; and (4) the evaluation method and results. Finally, we reflect on the strengths and limitations of our approach.

## Course design and development

Given the lack of recognised pedagogical models for designing MOOCs specifically for developing countries, we reviewed existing models of online pedagogy to guide our work. Because our MOOC had to support low-bandwidth connections, we could not rely on multimedia and video content to motivate and attract learners. We had to provide high-quality content in a largely textual format. Therefore, we needed a strong pedagogy to support the learners’ interaction with the content, facilitators, and peers, and thus to create an engaging learning experience.

There are several models of online pedagogy that have strong social elements. Mayes's Conceptual Learning model (Mayes & Fowler, 1999) is based on stages of "conceptualisation" and "construction" through the content first, before the stage of "dialogue" is introduced where deep learning takes place via student/teacher and student/student interaction. Laurillard's (2002) Conversational Framework looks at higher level learning through dialogue at a theoretical and practical level: through discussion, adaptation, interaction, and reflection. Salmon's (2011) Five Stage Model is based on increasingly high social interaction and reflective dialogue between students and facilitators, through multiple stages of tasks. However, based on our experiences with previous online courses, the model that seemed to best fit our situation was Garrison's (2007) Community of Inquiry model.

According to Garrison, Anderson and Archer (1999), "presence" is the key in online interactions, which makes learning "deep and meaningful" (Garrison & Cleveland-Innes, 2005), leads to high student engagement, and therefore achievement (Oblinger, 2014). In the Community of Inquiry model (Garrison, 2007), the learners' experience is shaped by three elements: cognitive presence, social presence, and teacher presence. Cognitive presence is the learner's ability to construct knowledge and negotiate meaning, with the learner actively engaging with the content through reflection and discourse with others. Social presence refers to connecting with others in the course, relationship building, and being able to engage in purposeful activities together despite the lack of face-to-face interaction. Finally, teacher presence comes across both within the design—through explicit signposting and guidance, and through facilitation activities and support offered to the learners.

Throughout the course design and development process, we referred to Garrison's model to support our decision-making. In the next section, we outline the rationale behind the pedagogic choices we made with respect to the course content, facilitation, and opportunities for peer-learning and peer-interaction.

### ***Cognitive presence – simple design and engagement with content***

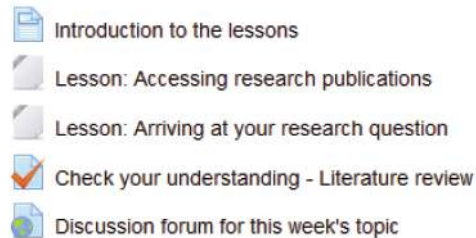
The content we developed for the course was deliberately text-based and low-bandwidth, considering the challenges related to Internet connectivity and digital literacy skills in developing countries. Then we focused on ways to engage learners with the topic and create opportunities for discussion, reflection, and practice. As most learners who take our courses have full-time responsibilities, we designed the course to not take more than three to four hours of study time per week.

The course was divided into sections: (1) course induction, with introductory information and activities to help participants make a strong start; (2) discussion forums containing thematic forums related to the course topics; (3) one section for each of the five key topics covered in the course; and (4) a wrap-up section containing the participant feedback form among other things. The five key topics were literature review, research ethics, writing a research paper (parts 1 and 2), and publishing a paper, and each topic was allocated one week in the course schedule (for example, Figure 1).



## Week One: 1 to 7 April 2016

### Literature review



**Figure 1: Screenshot of a key topic in the course**

The course content was in the form of 12 lessons, with two to three lessons for each of the five key course topics. Reflective questions embedded in the lessons serve to check learners' understanding, support meaning-making, and reinforce learning. Learners are provided with instant feedback and commentary on the questions. Cognitive presence can often be initiated through “triggering” events (Garrison, 2007). The lessons engaged the learners when introducing controversial topics such as research ethics and paper authorship, which organically led to lively discussions in the forums.

Each course topic had a check-your-understanding quiz made up of multiple-choice questions. Unlimited attempts were allowed on each quiz, and the answer key was revealed at the end of the course. Learners were required to pass each quiz by scoring at least 80% in order to receive a course completion certificate.

There were two writing activities in the course which included peer assessment. Peer assessment helps to develop cognitive presence through higher-level learning (Nagel & Kotzé, 2010) and social presence through co-learning with other participants. Learners benefit when they spend time on the “cognitively demanding” exercise of reviewing other learners' work (Nagel & Kotzé, 2010), which, in turn, should cause them to reflect on their own approach to the activity—this is a form of metacognitive knowledge construction through collaborative learning (Akyol & Garrison, 2011), which we have also noted in our recent work (Wild, Murugesan, Schaeffler & Powell, 2016). Furthermore, in a MOOC, it is usually not possible for the teacher to give personalised feedback on the learners' work. Through peer assessment, learners have the opportunity to get feedback on their work without depending on the teacher. In the MOOCs reported in this paper, the learners were asked to write a short essay on research ethics in the first writing activity and a research abstract in the second activity. After the submission phase, the activity moved to the assessment phase: every learner who submitted their work was randomly allocated three of their colleagues' submissions for assessment and given an assessment form.

### ***Teacher presence – guest facilitation and focused use of video***

We considered teacher presence to be an important aspect of the course. Only two members of the AuthorAID team were in charge of running the MOOCs, but the topic of research writing lends itself to deep discussion. To meet this challenge, we formed a team of “guest facilitators” drawn from (1) the AuthorAID network of voluntary mentors from our mentoring scheme; (2) researchers in developing countries who have attended AuthorAID train-the-trainers workshops; and (3) high achievers from previous online courses. Their main role was to respond to questions and take part

in conversations in the discussion forums, and they were provided with detailed guidelines on how to do this. Guest facilitators' posts were marked with an AuthorAID logo to distinguish them from participants' posts. When making weekly announcements, we encouraged the learners to engage in the forums because of the ever-present team of guest facilitators.

This approach has been tried in MOOCs elsewhere, for example, a team of 800 volunteers with basic subject knowledge to encourage learning connections in a MOOC with over 20,000 participants (Ramirez, 2014) and academic staff or "student ambassadors" as MOOC facilitators to intervene and guide discussions (Padilla Rodríguez, Armellini & Cáceres Villalba, 2016). Similarly, Lee & Rofe (2016) included completers of a previous course to create a team of "associate tutors". This model was also used by Redfield (2015), who called returning volunteer students "community TAs". The difference in our approach is that our guest facilitators are mostly experts in the course topic (research writing), which further enhances the depth of conversations in the forums.

Although we tried to keep the course as light on bandwidth as possible, we were influenced by studies showing that even short videos are effective at establishing the instructor's teaching presence with students (Jones, Naugle & Kolloff, 2008; Pan et al., 2012), and could potentially contribute to all three types of presences in Garrison's model (Garrison & Arbaugh, 2007). We therefore experimented in our first MOOC with a short introductory video featuring the two AuthorAID team members in charge of the course, in order to "humanise" their online interaction with the course participants. This was extended in our second MOOC to include a recorded discussion with the two AuthorAID team members and five guest facilitators.

### ***Social presence – structured and facilitated forum interaction***

We took care to create social presence early in the course by initiating personal introductions and peer-to-peer interaction in the forums. Social presence is achieved when participants are able to project their personal characteristics into the community, as "real people" (Garrison et al., 1999). Forum participation is vital in creating a sense of community and social presence, which if done successfully can lead to higher student performance (Hostetter & Busch, 2013). As Salmon (2011) points out, facilitators also have an important role in managing a learning community and socialisation. By engaging guest facilitators who were mostly subject-matter experts, we hoped to strengthen both the cognitive and the social aspects of the course.

Asynchronous online discussions can actually achieve higher cognitive value than face-to-face communication (Meyer, 2003), but it is important for the online discourse to be "structured and cohesive" (Garrison & Cleveland-Innes, 2005). In our MOOCs, we made available the course materials in a staggered fashion, with the materials for the first two weeks opened only at the start of those weeks, and the remaining materials opened in the third week. This was to keep the learners focused on one or more related topics at a time. However, in the first MOOC, we decided to ignite discussion by opening all the main discussion forums (one for each course topic) at the start of the course. Unfortunately, this made the forums somewhat chaotic with many questions about topics covered in lessons not yet available. Hence, in the second MOOC, we decided to structure the forums in the same way as the weekly course topics, only providing access to one forum per week until the third week, by which time an etiquette to forum interaction had emerged.

### **Course implementation and evaluation**

The course was implemented on [INASP's Moodle site](#) (Moodle version 2.6). Moodle is open-source educational technology widely used in both developed and developing countries. The course lessons

were developed using eXeLearning (eXeLearning version 2.0), an open-source content authoring tool. The content in the lessons is almost entirely text-based and therefore suitable for low-bandwidth connections common in developing countries. The content is licensed under Creative Commons and can be downloaded and viewed offline. Quizzes and peer assessment activities were developed using the Moodle “quiz” and “workshop” tools, respectively. Google Hangouts was used to record the video discussions.

The first MOOC (MOOC #1 henceforth) ran from October to November 2015, and MOOC #2 ran from April to May 2016. Both were six weeks long. For both the MOOCs, an open call for enrolment was publicised over a month before the start date through the AuthorAID website (visited by over 50,000 users annually), social media accounts (Facebook and Twitter), and email to the INASP network of institutions and partner organisations (INASP, 2016).

To evaluate the learners’ experience of the MOOCs, we collected both qualitative and quantitative data—the former through a participant feedback survey at the end of each course and the latter through learning analytics. The feedback survey, made with the Moodle “feedback” tool, contained several questions with answer choices on a 5-point Likert scale plus a “not applicable” option, as well as open-ended questions. The participants were asked to give feedback on (1) the course structure and overall relevance of the course; (2) the course administrators and facilitators; (3) the lessons, activities, and discussion forums; (4) logistics and technology—for example, the device they used to study and the factors that disrupted their work on the course; and (5) overall matters.

Moodle offers learning analytics to help teachers understand participation dynamics and performance levels. This allowed us to explore associations between different items. We used MS Excel and the statistical computing application R for quantitative analysis covering the whole population of learners (without any sampling).

## Results and discussion

In reporting the results below, we focus on the three types of presences (cognitive, social, and teacher) and evidence of (1) the learners’ ability to deeply engage with the content and negotiate meaning through the learning platform; (2) relationship building and learning together and from each other through peer interaction; and (3) facilitation presence encouraging learner engagement and supporting learning in the course. We also report on results from a follow-up survey and the course completers’ perceptions of the role that the course played in helping them get published.

Typically in MOOCs there is a high dropout rate right at the beginning of the course, and completion often averages around 3% to 15% (Hollands & Tirthali, 2014). One of the key indicators of success of our approach would be, therefore, a healthy completion rate. In both our MOOCs, the learners had to complete a background information form in order to access the course material. Completion of the background information form was the first step towards actual participation in the course, so in our analysis we focused on this base of “actual learners”.

In MOOC #1 there were 1275 actual learners among the 1752 people who enrolled. In MOOC #2, these numbers were 1555 and 3033, respectively. The total of 2830 actual learners came from 95 countries predominantly in the developing world: a little over 50% from Africa, another 40% from Asia, and most of the remainder from the Middle East and Latin America. Highly represented countries—with more than 100 learners per country—were Sri Lanka, India, Nigeria, Kenya, Ghana, Nepal, Egypt, Somalia, the Philippines, and Uganda. Table 1 shows the completion rate in the two MOOCs; the average rate was 53%.

**Table 1: Actual learners and completion rates**

Course	No. of actual learners (% women)	% of course completers (% women)	No. of developing countries represented by the completers (women)
MOOC #1	1275 (45%)	47% (49%)	51 (40)
MOOC #2	1555 (46%)	58% (61%)	52 (42)

In addition to the high completion rates, the results by gender are worth noting. The participation rate of 45%–46% women would seem to buck the trend of research showing that developing country female participation in MOOCs is low: Christensen et al. (2013)'s study of Coursera MOOCs found that only 37% of participants from developing countries were female, in contrast with US participants who were 49% female. Ho et al. (2015) discovered that as low as 31% of developing country participants on HarvardX and MITx courses were female.

The completion rate for female learners is higher than that for males in both the MOOCs (Table 1), and to check if this difference is statistically significant we ran the Pearson's Chi-squared test in R using the data shown in Table 2.

**Table 2: Contingency table for gender and course completion (both the MOOCs combined)**

Gender	Participants who did not complete the course	Participants who completed the course
Female	571	712
Male	761	786

Because the  $p$  value obtained (0.014) is less than the significance level (0.05), we can reasonably conclude that there is an association between gender and course completion. Female learners were more successful at completing the course. This result compares to Garrido et al. (2016), who found that female MOOC participants in certain developing countries (Colombia, South Africa, and the Philippines) are more likely than men to be completers.

In general, feedback from the participants suggests the course content was engaging: 90% of the 1475 respondents (in the two MOOCs combined) completely agreed that the course was relevant to their learning needs and 83% completely agreed that the interactive e-learning format used for the lessons was better than plain text or static content. Further, 93% completely agreed that the weekly quizzes helped them validate their understanding of the course content. Participants also appreciated that the lessons were downloadable and could be reviewed in the future, and the fact that they were written with non-native speakers in mind: "The lessons were straight-forward with simplified English which makes understanding very easy". We must add a caveat here that nearly everyone who gave feedback was a course completer.

In our choice of technology we took great care to ensure that the course was accessible to researchers in countries with weak Internet connectivity. Although 32% of feedback respondents still experienced significant disruption to their participation because of Internet connectivity, it is worth mentioning that among the course completers were 115 researchers from many countries considered as fragile: the top 12 countries from a formal list (List of countries by Fragile States Index, n.d.) plus Sierra Leone, Liberia, Myanmar, Burundi, and West Bank and Gaza/Palestine.

It is worth noting that when it came to peer assessment, 48% of respondents named this activity as one of the most useful elements of the course and 71% either completely or partly agreed that

they received useful feedback from their peers. Several learners expressed interest in having more peer assessment activities. Some commented on why doing the review was helpful to them: “It gives me the experience to be the student and the teacher as well. It validates what I have learned and I share that learning to my colleagues’. Others said they benefited from the feedback they received: “I am satisfied with the assessments and I feel energised and motivated to complete my journal paper”.

The social component of the course was driven by active forums. Of the 2830 learners in the two MOOCs, 1088 (36%) made at least one post in the forums, and there were 9456 posts in all. This compares favourably to other MOOCs. Hill (2013) has argued that centralised discussion forums do not scale in MOOCs, using examples such as the first edX MOOC where forums were used only by 3% of the learners (Breslow et al., 2013) and the first Vanderbilt MOOCs where forum participation ranged from 4% to 22% (Bruff, 2013).

Feedback for the social component was positive: 63% completely agreed that they learnt new things from peers on the forums, with 23% partly agreeing; 45% thought that the forums were one of the most useful elements of the course; 54% planned to stay in touch with other participants after the course; and 19% reported that they had already started discussions with other participants about possible research collaboration, showing the strong social connections that had been established. The level of participation and interaction was praised: “The large volume of participation in itself was a very good thing” and “I thoroughly enjoyed how interactive the course was, particularly the discussion forums”.

To see how forum participation influenced success on the course, we put together the data shown in Table 3.

**Table 3: Contingency table for forum posts and course completion (both the MOOCs combined)**

No. of forum posts	Participants who did not complete the course	Participants who completed the course
Zero	1157	665
One or more	175	833

Only 36% of the learners who made zero posts (665 out of 1822) completed the course, in stark contrast to 83% of those who made at least one post (833 out of 1008). Unsurprisingly, this difference is statistically significant ( $p < 2.2e-16$ ; Pearson’s Chi-squared test). Both men and women were almost equally likely to participate in the forums: 35% and 36% of the female and male learners, respectively, made at least one post.

It seems reasonable to attribute the success of the discussion forums to the strong teacher presence provided by the team of guest facilitators. In both the MOOCs, the ratio of the number of learners’ posts to the guest facilitators’ posts was encouraging (Table 4).

**Table 4: Count of forum posts (both the MOOCs combined)**

Course	No. of guest facilitators (% women)	No. of countries represented by guest facilitators (women)	No. of guest facilitators’ posts (% women)	No. of learners’ posts (% women)	Ratio of learners’ to guest facilitators’ posts
MOOC #1	18 (39%)	13 (7)	796 (22%)	4002 (44%)	5.03
MOOC #2	20 (50%)	16 (8)	1073 (45%)	5454 (39%)	5.08

Feedback on the guest facilitator input was positive: 61% completely agreed that guest facilitator posts in the forums “contributed significantly to my knowledge” and 23% partly agreed. One participant commented that “It doesn’t seem like self-learning at all, thanks to the easy to use features, design and amazing level of interactions. The replies by guest facilitators is a course in itself”.

The facilitator panel discussion video we included in the middle of MOOC #2 was also well received: “It was nice to put faces and voices to some of the facilitators which gave me a sense of nearness”.

### ***Early results from a follow-up survey***

We administered a follow-up survey to the 596 completers of MOOC #1 ten months after the course ended to find out if they had achieved success in what the course had trained them for, that is, writing and publishing papers. We report below the results from an initial analysis of the data.

The 284 survey respondents reported having published 148 journal articles after the course, and 74% of the respondents who managed to publish a paper in the time elapsed felt that the course “helped a lot” with their publishing endeavours. Some expanded on their responses, revealing that the course provided a boost in confidence to write up and submit their paper:

- “The course has helped me to have self-confidence in scientific writing. After the course, I wrote two papers and both are already published. Now, I am preparing for another one!”
- “Before the online training, I had carried out my fieldwork but had been unable to consolidate it into a report or publication. However, after the training I acquired confidence in writing and within two months, I was able to submit a manuscript. So far I have been able to publish 2 papers in peer refereed journals.”

Although female learners were more successful in completing the course, better performance on a training programme does not necessarily translate into better post-training success. While 46% of male respondents have published at least one paper after the course, only 36% of women have done so.

We plan to do an in-depth analysis in the near future to compare the participants’ post-course publication success with baseline data from the background information form and to understand the reasons for the gendered difference in success.

## **Conclusion**

Although MOOCs are now commonplace, the literature review we conducted revealed a lack of recognised models for developing such courses specifically for the context and needs of developing countries. We used Garrison’s Community of Inquiry model and our experience of working in Africa and Asia to guide us in our design decisions and, hopefully, create an engaging and social learning experience. Below, we reflect on the strengths, challenges, and limitations of our work.

### ***Strengths of our approach***

The completion rate of 58% in MOOC #2 can be considered high in the MOOC context. This may be partly because developing country learners are more likely to complete MOOCs (Garrido et al., 2016), but we also believe that two critical factors contributed to the high completion rate in both the MOOCs we offered: (1) we designed the course for a specific target audience, keeping in mind their expectations and constraints; and (2) the pedagogical model we adopted helped us develop learning activities in such a way that deep learning and meaning-making were facilitated through structured social interaction and driven by the strong presence of expert facilitators. These factors may be largely responsible for the following positive outcomes:

1. The evaluation results from both the MOOCs show that female researchers were not only well represented among the course participants but also more successful at completing the course. Therefore, this MOOC approach to CPD training is encouraging from a gender equity perspective.
2. By tapping into our network of experts, providing them with clear guidelines that made guest facilitation an interesting activity (without excessive responsibility on any single guest facilitator), and incentivising the work of facilitation through certificates and badges, we were able to provide a healthy level of teacher presence on the MOOCs without incurring any financial cost.
3. The more structured social interaction in MOOC #2 may have contributed to the improved completion rate compared to MOOC #1. Because the forum for each course topic was opened in sync with the relevant course material, the forum posts seemed to be of higher quality than in MOOC #1. Guest facilitators who served on both the MOOCs observed that in MOOC #2 learners were asking more thoughtful questions upon reading the lessons, rather than overloading the forums without prior preparation.
4. A substantial number of participants were engaged enough in the course to commit to peer assessment activities, which contained cognitive and social learning aspects. The task was designed to relate directly to CPD in that it modelled a real-life episode participants would be likely to face: journal peer review. Some participants reported that the activity actually gave them confidence to submit their research to a journal.

### **Challenges and limitations**

Taking stock of our MOOC approach and results, we have identified some key challenges and limitations.

1. It has been difficult to collect feedback from those who did not complete the course, so we do not have a good understanding of why 40% to 50% of learners dropped out of the course after making a start on it. Perhaps following up with them in a personalised way and arranging phone interviews will provide useful information.
2. The peer assessment activities did not suit everybody. The majority of the course completers (79%) in the two MOOCs participated in both the submission and assessment phases of at least one peer assessment activity (and thus received a “merit” grade instead of the basic “pass”), but there was often confusion about how this activity worked. The out-of-the-box functionality of the Moodle “workshop” tool is not as intuitive as it could be. There were many requests for deadline extensions which we could not offer because of the timed phases of the activity (submission, assessment, closure). Others have commented that strict deadlines in MOOCs fail to account for developing country problems such as intermittent Internet and electricity (Bali, 2014). Hopefully, our decision to make this an optional but recommended activity partly addresses this issue. We are also looking into other tools for peer assessment that can be integrated in a Moodle course.
3. Initial analysis of the follow-up survey of MOOC #1 reveals that women do not seem to have achieved as much success as men in terms of papers published. This indicates that some kind of gendered intervention may be necessary beyond training to support women in achieving impact, at least for the context in which we work.
4. Certain learner groups may be less successful in completing our MOOC than others. We plan to carry out a detailed analysis to identify these learner groups and to ascertain what can be done to improve the course outcomes on the whole and for different learner groups.

We intend to continue using the pedagogical model described in this paper for our MOOCs in the future, and we shall use data from learning analytics, learner feedback, and impact evaluation to improve our course design and delivery. We believe that the MOOC approach reported in this paper may be suitable for providing CPD training in other topics that are in high demand in the developing world.

## Acknowledgements

The authors thank Ruth Bottomley and Julie Walker of INASP who helped develop the strategy behind the MOOC approach reported here, and all the guest facilitators who played a vital role in these courses. We also thank the UK's Department for International Development (DFID) and Swedish International Development Cooperation Agency (Sida) for funding INASP's AuthorAID project, which includes the MOOCs described here.

## References

- Aboshady, O. A., Radwan, A. E., Eltaweel, A. R., Azzam, A., Aboelnaga, A. A., Hashem, H. A., Darwish, S. Y., Salah, R., Kotb, O. N., Afifi, A. M., Noaman, A. M., Salem, D. S. & Hassouna, A. (2015). Perception and use of massive open online courses among medical students in a developing country: Multicentre cross-sectional study. *BMJ Open*, 5(1), e006804. Retrieved from <http://bmjopen.bmj.com/content/5/1/e006804>
- Akyol, Z., & Garrison, D. R. (2011). Understanding cognitive presence in an online and blended community of inquiry: Assessing outcomes and processes for deep approaches to learning. *British Journal of Educational Technology*, 42(2), 233–250. <https://doi.org/10.1111/j.1467-8535.2009.01029.x>
- Bali, M. (2014). MOOC pedagogy: Gleaning good practice from existing MOOCs. *Journal of Online Learning and Teaching*, 10(1), 44. Retrieved from [http://jolt.merlot.org/vol10no1/bali\\_0314.pdf](http://jolt.merlot.org/vol10no1/bali_0314.pdf)
- Breslow, L., Pritchard, D. E., DeBoer, J., Stump, G. S., Ho, A. D., & Seaton, D. T. (2013). Studying learning in the worldwide classroom: Research into edX's first MOOC. *Research & Practice in Assessment*, 8. Retrieved from <http://files.eric.ed.gov/fulltext/EJ1062850.pdf>
- Bruff, D. (2013, August 19). *Lessons learned from Vanderbilt's first MOOCs*. Blog post. Retrieved from <https://cft.vanderbilt.edu/2013/08/lessons-learned-from-vanderbilts-first-moocs/>
- Castillo, N. M., Lee, J., Zahra, F. T., & Wagner, D. A. (2015). MOOCs for development: Trends, challenges, and opportunities. *Information Technologies & International Development*, 11(2), 35. Retrieved from <http://itidjournal.org/index.php/itid/article/view/1396>
- Christensen, G., Steinmetz, A., Alcorn, B., Bennett, A., Woods, D., & Emanuel, E. J. (2013). *The MOOC phenomenon: Who takes massive open online courses and why?* <http://dx.doi.org/10.2139/ssrn.2350964>
- Daniel, J., Vázquez, E., & Gisbert, M. (2015). The Future of MOOCs: Adaptive Learning or Business Model? *International Journal of Educational Technology in Higher Education*, 12(1), 64–73. <https://doi.org/10.7238/rusc.v12i1.2475>
- Freeman, P., & Robbins, A. (2006). The publishing gap between rich and poor: the focus of AuthorAID. *Journal of Public Health Policy*, 27(2), 196–203.
- Garrido, M., Koepke, L., Andersen, S., Mena, A. F., Macapagal, M., & Dalvit, L. (2016). *An examination of MOOC usage for professional workforce development outcomes in Colombia, the Philippines, & South Africa*. Seattle: Technology & Social Change Group, University of Washington Information School.




- Garrison, D. R. (2007). Online community of inquiry review: social, cognitive, and teaching presence issues. *Journal of Asynchronous Learning Networks*, 11(1), 61–72. Retrieved from <http://eric.ed.gov/?id=EJ842688>
- Garrison, D. R., Anderson, T., & Archer, W. (1999). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*, 2(2–3), 87–105. [http://dx.doi.org/10.1016/S1096-7516\(00\)00016-6](http://dx.doi.org/10.1016/S1096-7516(00)00016-6)
- Garrison, D. R., & Cleveland-Innes, M. (2005). Facilitating cognitive presence in online learning: Interaction is not enough. *The American Journal of Distance Education*, 19(3), 133–148. [http://dx.doi.org/10.1207/s15389286ajde1903\\_2](http://dx.doi.org/10.1207/s15389286ajde1903_2)
- Garrison, D. R., & Arbaugh, J. B. (2007). Researching the community of inquiry framework: Review, issues, and future directions. *The Internet and Higher Education*, 10(3), 157–172. <http://dx.doi.org/10.1016/j.iheduc.2007.04.001>
- Hill, P. (2013, September 16). *MOOC discussion forums: Barrier to engagement? Blog post*. Retrieved from <http://mfeldstein.com/mooc-discussion-forums-barriers-engagement/>
- Ho, A. D., Chuang, I., Reich, J., Coleman, C., Whitehill, J., Northcutt, C., & Petersen, R. (2015). HarvardX and MITx: Two years of open online courses fall 2012–summer 2014. *HarvardX Working Paper No. 10*. <http://dx.doi.org/10.2139/ssrn.2586847>
- Hollands, F. M., & Tirthali, D. (2014). MOOCs: expectations and reality. Full report. NY: Center for Benefit Cost Studies of Education, Teachers College, Columbia University.
- Hostetter, C., & Busch, M. (2013). Community matters: Social presence and learning outcomes. *Journal of Scholarship of Teaching and Learning*, 13(1), 11–86. Retrieved from <http://josotl.indiana.edu/article/views/3268/3623>
- INASP (2016). *INASP network of countries*. Retrieved from <http://www.inasp.info/en/network/>
- Jones, P. (2015, July 29). Predatory publishing isn't the problem, it's a symptom of information inequality. *Perspectives*. Retrieved from <https://www.digital-science.com/blog/perspectives/predatory-publishing-isnt-the-problem-its-a-symptom-of-information-inequality/>
- Jones, P., Naugle, K., & Kolloff, M. (2008, March 31). Teacher presence: Using introductory videos in online and hybrid courses. *Learning Solutions Magazine*. Retrieved from <https://www.learningsolutionsmag.com/articles/107/teacher-presence-using-introductory-videos-in-online-and-hybrid-courses>
- Langer, A., Díaz-Olavarrieta, C., Berdichevsky, K., & Villar, J. (2004). Why is research from developing countries underrepresented in international health literature, and what can be done about it? *Bulletin of the World Health Organization*, 82(10), 802–803.
- Laurillard, D. (2002). *Rethinking university teaching. A conversational framework for the effective use of learning technologies*. London: Routledge.
- Lee, Y., & Rofe, J. S. (2016). Paragogy and flipped assessment: Experience of designing and running a MOOC on research methods. *Open Learning: The Journal of Open, Distance and e-Learning*, 31(2), 116–129. <http://dx.doi.org/10.1080/02680513.2016.1188690>
- Lieber, J. (2013). In the developing world, MOOCs start to get real. *MIT Technology Review*. Retrieved from <https://www.technologyreview.com/s/512256/in-the-developing-world-moocs-start-to-get-real>
- List of countries by Fragile States Index. (n.d.). In Wikipedia. Retrieved from [https://en.wikipedia.org/wiki/List\\_of\\_countries\\_by\\_Fragile\\_States\\_Index](https://en.wikipedia.org/wiki/List_of_countries_by_Fragile_States_Index)
- Liyanagunawardena, T. R., Williams, S., & Adams, A. A. (2013). The impact and reach of MOOCs: A developing countries' perspective. *eLearning Papers*, 38–46. Retrieved from [http://centaur.reading.ac.uk/32452/1/In-depth\\_33\\_1.pdf](http://centaur.reading.ac.uk/32452/1/In-depth_33_1.pdf)

- Mayes, J. T., & Fowler, C. J. (1999). Learning technology and usability: a framework for understanding courseware. *Interacting with Computers*, 11(5), 485–497.
- Meyer, K. A. (2003). Face-to-face versus threaded discussions: The role of time and higher-order thinking. *Journal of Asynchronous Learning Networks*, 7(3), 55–65.
- Murugesan, R. (2012). Promising outcomes of an online course in research writing at a Rwandan university. *European Science Editing*, 38(3). Retrieved from <https://arxiv.org/abs/1210.1709>
- Nagel, L., & Kotzé, T. G. (2010). Supersizing e-learning: What a Col survey reveals about teaching presence in a large online class. *The Internet and Higher Education*, 13(1–2), 45–51. <http://dx.doi.org/10.1016/j.iheduc.2009.12.001>
- Nobes, A. (2016a). Open access plays a vital role in developing-country research communication. *Eon* (9)2, 25. <http://dx.doi.org/10.18243/eon/2016.9.2.8>
- Nobes, A. (2016b). AuthorAID – supporting early career researchers in developing countries. *The Biochemist* 38(5). Retrieved from <http://www.biochemist.org/bio/03805/0039/038050039.pdf>
- Nchinda, T. C. (2002). Research capacity strengthening in the South. *Social Science & Medicine*, 54(11), 1699–1711.
- Oblinger, D. (2014). Designed to engage. *Educause Review*, 49(5). Retrieved from <https://er.educause.edu/articles/2014/9/designed-to-engage>
- Owens, B. (2013). AuthorAID to add online courses for social scientists. *SciDevNet*. Retrieved from <http://www.scidev.net/global/education/news/authoraid-to-add-online-courses-for-social-scientists.html>
- Patru, M., & Balaji, V. (2016). *Making sense of MOOCs: A Guide for policy-makers in developing countries*. Commonwealth of Learning Guides & Toolkits. Retrieved from <http://dspace.col.org/handle/11599/2356>
- Padilla Rodríguez, B. C., Armellini, A., & Cáceres Villalba, V. C. (2016). Massive open online courses (MOOCs) behind the scenes. In Kirby, P. & Marks, G. (Eds.). *Proceedings of Global Learn 2016* (pp. 359–366). Retrieved from <http://nectar.northampton.ac.uk/8485/>
- Pan, G., Sen, S., Starrett, D. A., Bonk, C. J., Rodgers, M. L., Tikoo, M., & Powell, D. V. (2012). Instructor-made videos as a scaffolding tool. *Journal of Online Learning and Teaching*, 8(4), 298. Retrieved from [http://jolt.merlot.org/vol8no4/pan\\_1212.htm](http://jolt.merlot.org/vol8no4/pan_1212.htm)
- Ramirez, M. S. (2014). Training strategies in team teaching to facilitate the connection of learning in MOOC courses. In *EDULEARN14 Proceedings* (pp. 3052–3060).
- Redfield, R. J. (2015). Putting my money where my mouth is: the Useful Genetics project. *Trends in Genetics*, 31(4), 195–200. <http://dx.doi.org/10.1016/j.tig.2015.02.004>
- Salmon, G. (2011). *E-moderating: The key to teaching and learning online* (3rd ed.). New York: Routledge.
- Warusavitarana, P. A., Lokuge Dona, K., Piyathilake, H. C., Epitawela, D. D., & Edirisinghe, M. U. (2014). MOOC: a higher education game changer in developing countries. In Hegarty B., McDonald J., & Loke, S.-K. (Eds.), *Rhetoric and Reality: Critical perspectives on educational technology. Proceedings ascilite Dunedin 2014* (pp. 359–366).
- Wild, J., Murugesan, R., Schaeffler, V., & Powell, A. (2016). Bringing learning closer to the workplace: An online course for librarians in developing countries. *Pan-Commonwealth Forum 8 (PCF8) Working Paper*. Retrieved from <http://oasis.col.org/handle/11599/2587>
- Wildavsky, B. (2015). MOOCs in the developing world: Hope or hype? *International Higher Education*, 80, 23–25. <http://dx.doi.org/10.6017/ihe.2015.80.6154>



## Current Status of the MOOC Movement in the World and Reaction of the Turkish Higher Education Institutions

Cengiz Hakan Aydin   
Anadolu University (Turkey)  
[chaydin@anadolu.edu.tr](mailto:chaydin@anadolu.edu.tr)

### Abstract

This manuscript intends to elaborate the current status of MOOC movement in the world and to reveal the results of a survey study in which the Turkish higher education institutions' reactions to this movement was investigated. The survey was actually a part of a larger survey study that, as a deliverable of the EU funded HOME project, was conducted to contribute to the literature by providing an insight about European perspectives on MOOCs, to gain a better understanding of the strategic reasons why a higher education institution is or isn't involved in MOOCs, and to compare these reasons with the results of similar studies in U.S. After a brief background and history of MOOC movement, following sections of the manuscript present the details (methodology and results) of the survey study on the Turkish HE institutions' strategies regarding adaptation of MOOCs. The final part of the manuscript consists of discussions and conclusions drawn in the light of the results of the study.

**Keywords:** MOOC; adaptation; Turkey; Higher Education; institutional strategy; online education

### Introduction

Since the first offering in 2008 by George Siemens and Stephen Downes, the massive open online courses, or MOOCs, has been at the focal point of all the stakeholders of higher education institutions. MOOCs are courses designed for large numbers of participants, that can be accessed by anyone anywhere as long as they have an internet connection, are open to everyone without entry qualifications, and offer a full/complete course experience online for free (OpenupEd, 2014).

Dave Cormier and Bryan Alexander are the first ones proposed the term MOOCs (Herman, 2012). However, it is widely accepted that MOOC movement has started in 2008 by a course called *Connectivism and Connective Knowledge* (CCK08), which was facilitated by George Siemens and Stephen Downes (Siemens, 2013). The success of connectivist MOOCs does not only fostered the development of extended MOOCs, or xMOOCs but also encouraged many for-profit or non-profit organizations as well as countries to offer MOOCs (Daniel, 2012). Udacity, Udemy, EdX, FutureLearn, J-MOOCs, OpenupEd are among these initiatives.

According to a report prepared by Stanford Class Central, it was estimated that more than 500 Universities offer 4200 courses to 35 million learners globally (Shah, 2016). Coursera, a for-profit provider, offers more courses than many others (Shah, 2016) and there is a US domination (Straumsheim, 2017). In other words, around 60% of courses are being offered by US-based providers (Shah, 2016). However, European based MOOC initiatives are progressing fast. For instance, FutureLearn of UK, which has actually started as a respond to US-based providers, encouraged by the UK government and is led by Open University of UK, reached more than 3 million learners after its launch in late 2013 (Walton, 2016). France Université Numérique (FUN), Miriadax, ECO and EMMA are among the other larger MOOCs initiatives in Europe. OpenupEd is actually an initiative to promote Europe-based MOOC initiatives. It does not offer a single MOOC platform but rather let every partner use their own platforms. It also promotes diversity, multilingualism,

equality and quality. It provides quality guidelines and labels as well as marketing opportunity to its partner MOOC providers (OpenupEd, 2016).

In Asia, the governments are playing an active role in MOOC initiatives. For instance, K-MOOCs in South Korea, Thai MOOCs, Malaysian MOOCs, Chinese MOOCs, and Philippines are among the national initiatives promoted by the governments. Kim (2015) lists the major incentives behind the governments' interests in MOOCs as to provide higher education opportunity to more people (China), or to reform their existing systems of higher education and lifelong learning (Korea and Malaysia). On the other hand, Japanese MOOC provider J-MOOCs is a joint-initiative and similar to FutureLearn. In other words, a consortium composed of universities, corporations, governmental institutes, and academic societies promoted by the Japanese government was established to offer MOOCs.

In sum, all around the world there is a growing interest in demand MOOCs and supply for MOOCs despite several unanswered questions, such as sustainability and low completion rates.

### MOOCs in Turkey

In Turkey, the MOOC movement is still in infancy stage. Especially the supply part is quite weak. There are only a few universities and a couple for-profit initiatives that provide MOOCs. Anadolu University and Erzurum Ataturk University have already a history in open and distance learning and based on their experiences they are the major MOOC providers in the country. Both launched their MOOC platforms in late 2014 and offered first courses in 2015. Anadolu University, for example, has started with 8 courses mainly in social sciences and humanities and more than 2000 learners in its custom developed MOOC platform called as AKADEMA (<http://akadema.anadolu.edu.tr/>). However, after the first round, Anadolu University decided to change its platform and gave a break until June 2016. Currently, AKADEMA offers 48 courses in Turkish and 1 in English to all who would like to take it via its Blackboard-based platform. Atademix, on the other hand, is the name of the Erzurum Ataturk University's MOOC initiative. The University has already offered 14 courses in Turkish and is currently running another course too. Atademix is a Moodle-based MOOC platform ([atademix.atauni.edu.tr](http://atademix.atauni.edu.tr)). Additionally, Yaşar University, a private HE institution in İzmir, transferred some of its online courses as self-paced MOOCs and offered to all. Currently they are offering 17 courses without any certification ([hayatboyu.yasar.edu.tr](http://hayatboyu.yasar.edu.tr)). Furthermore, Koç University, another private institution in İstanbul, offers 6 courses in Turkish in Coursera, and a GSM company, Turkcell sponsors to offer 3 courses in EdX. Also, a couple entrepreneurs intended to create a Coursera-like environment in Turkey, entitled as UniversitePlus (<https://www.universiteplus.com/>). Currently they offer 46 courses in collaboration with four different universities.

Although there is not any study or reliable reference, it seems that demand for MOOCs is growing faster than the supply side. Especially in the corporate settings, the training departments lead their employees to take Coursera and EdX courses. Also, Khan Academy is offering courses in Turkey in Turkish and not only corporations but also educational institutions and single users show great interest in these courses. Still, there is no reliable and valid data on how many learners are participating in these courses.

Another shortage of data about MOOCs in Turkey is related to awareness, perceptions, adaptation or refraining reasons of the higher education institutions. The same shortage felt by HOME Project partners and a survey study was conducted to contribute to the literature by providing an insight about European perspectives on MOOCs (HOME, 2014), to gain a better understanding of the strategic reasons why a higher education institution is or isn't involved in MOOCs, and to compare these reasons with the results of similar studies in the U.S. (Allen & Seaman, 2014; 2015). The

following sections of the manuscript elaborate this study and results collected from participant Turkish universities.

## Study

The study, entitled as Institutional MOOC strategies in Europe, intended to explore the European higher education institutions awareness, perspectives, adaptation strategies and refraining reasons regarding MOOCs. It was conducted during the fourth quarter of 2015. The survey was largely a repetition of the survey from 2014 (Jansen & Schuwer, 2015). In order to have a base to compare the results of this study with the Babson Group's results (Allen & Seaman 2014, 2015, 2016), quite a number of questions were adapted from the instrument Babson Group used. Most questions were kept identical to the 2014 survey. Some additional questions were developed during the summer of 2014 and tested among HOME partners (mainly related to section 6 and 7). After finalizing the English version, the survey was translated into French and Turkish. A Google form offering those three languages was open from 15th October to 4th January 2016. Higher education institutions were in general approached by personal contact and by the use of newsletter and social media to complete the questionnaire.

## Instrumentation

The survey instrument was developed based-on the HOME Project partners' initial discussions and also some items were taken from a survey that has been implemented some time in U.S. (Allen & Seaman, 2014; 2015; 2016). As a result, the final version of the survey consisted of the following 9 sections:

1. Profile Information (8 open question)
2. Status of MOOC offering, main target group and impact on institution (5 questions with various answer categories, 3 identical questions as used in the US surveys)
3. Do you agree with the following statements? (4 identical questions as used in the US surveys and an optional open question)
4. Primary objective for your institution's MOOCs (1 question with 9 options identical to US survey)
5. Relative importance of the following objectives for your institution's MOOCs (4 closed question on 5 point Likert scale plus an open question)
6. What are the primary reasons for your institution to collaborate with others on MOOCs? (a list with 24 possibilities and 1 open question)
7. What are the primary reasons for your institution to outsource services to other (public and/or private) providers on MOOCs? (a list with 24 possibilities and 1 open question)
8. How important are the following macro drivers for your institutional MOOC offering? (10 closed question on 5 point Likert scale)
9. How important are the following dimensions of a MOOCs? (15 closed question on 5 point Likert scale)

Most closed questions could be scored on a 5-point scale ranging from *Not at all relevant for my institution* to *Highly relevant for my institution*. Exceptions are those closed questions that were included from the US survey (Allen & Seaman, 2014; 2015; 2016). These questions were kept identical with those in their survey, so comparisons could be made.

In order to secure the validity of the instrument, a sort of a simplified version of Delphi technique was used. Namely, the HOME project partners (total 23) were asked to review the items (questions

and alternative choices for the close-ended ones) included in the questionnaire several times in order to finalize it. After receiving approval of all the partners, the questionnaire was translated and localized to the Turkish context by the author. Later the Turkish version was shared with three experts to secure the content validity. The experts individually asked to review the instrument based-on following questions: Is the questionnaire valid? In other words, is the questionnaire measuring what it intended to measure? Does it represent the content? Is it appropriate for the sample/population? Is the questionnaire comprehensive enough to collect all the information needed to address the purpose and goals of the study? Does the instrument look like a questionnaire? One of these experts was an experienced professor of open and distance learning while the other two were professors in English Language. After receiving their recommendations, the questionnaire was finalized and an online version was created.

### **Participants**

In total 168 institutions responded out of 30 countries to the questionnaire. This was corrected to a) include only higher education institutions (HEIs) which are part of the formal Higher Education (HE) structure of the country of origin and b) only one response per institution, i.e. select the one most representative to answer the questions. So, the response in total is 150 HEIs, out of which 23 universities from different regions of Turkey. In Turkey, three universities are legally authorized to offer massive open and distance learning. These three were among the 23 participants. Along with these ODL providers 3 universities from Ankara, the capital city, 3 from Istanbul and 2 from İzmir also responded the survey. All the other participant universities are located in other provinces of the country from very far east to west, north to south. Furthermore, among these 23 institutions only 3 were private and all the others were public institutions.

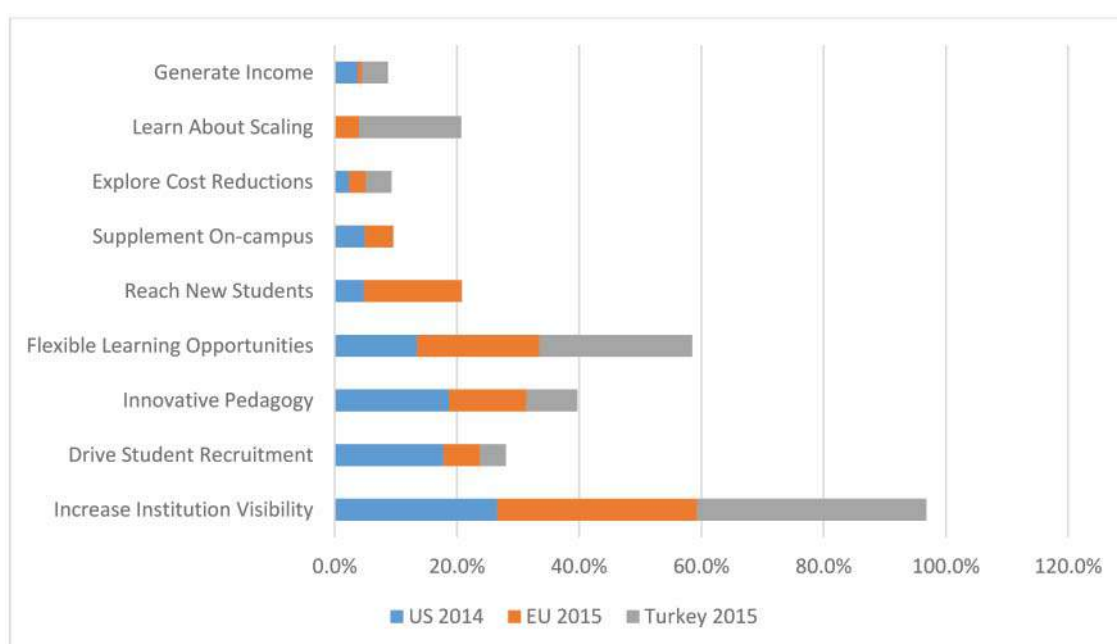
### **Analysis**

In this report, some results are compared with other studies, to similar audience, using exactly the same questions. The abbreviations US2013, US2014 and US2015 refer to the US studies published a year later (Allen & Seaman, 2014; 2015; 2016). EUA2013 refers to the European survey in 2013 published by Gaebel, Kupriyanova, Morais and Colucci (2014); EU2014 (all) to results of Jansen and Schuwer (2015) and Jansen, Schuwer, Teixeira and Aydin (2015); the results of the overall survey are referred to as S2015 (all). And as can be interpreted easily Turkey2015 indicates the results derived from the Turkish participants of the questionnaire. As such the year mentioned in these abbreviations refer to the year the survey was conducted.

### **Results**

One of the questions whose answer were sought in the study was about the institutions' objectives to offer MOOCs. As can be observed in Figure 1, the Turkish universities have almost the same objectives as Europe and quite similar to U.S. institutions. Increasing institutional visibility is the major objective for the Turkish universities the same as for EU and US. Providing flexible learning opportunities also seems a more significant objective for both Turkish and European universities compare to US. Interestingly learning about scaling is also an important objective for Turkish institutions while just a few in EU and none in US. Moreover, for Turkish institutions reaching new student and supplementing on-campus education via MOOCs are not as important as other objectives.

The Higher Education Council (HEC), a government agency that takes all the decisions about higher education in Turkey, has been given importance to internationalization over the last five years and encourages the HE institutions to access and accept more international students. This could be related to the increase institutional visibility objective. Namely, the institutions that have an objective to reach more international students want to increase their visibility in international area and so they may see MOOCs as a tool to increase their visibility. On the other hand, as it has been mentioned before, the majority of the participant institutions has been offering open and distance learning for some time and so they have a faith to provide flexible learning opportunities to all. That might be why, flexible learning opportunities was chosen as a major objective by many Turkish HE institutions. Also, since Turkey has a large young population there is a huge demand for HE and so the institutions do not struggle to find students. Thus, not many Turkish Universities consider driving student recruitment as an objective as opposed to the US institutions.



**Figure 1: Primary Objective of Adapting MOOCs**

Figure 2 shows that a big majority of the institutions has no plans (45.8%) to offer MOOCs. A few (8.3%) has no intention too. On the other hand, in 2015 it seems 16.7% of the participant institutions offered MOOCs which is a higher ratio than the survey conducted in US. The remaining participants indicated themselves as MOOC providers however investigation of their Web sites uncovers that only one fourth of them are really offering MOOCs and others offer just online courses but not MOOCs. In sum, the study reveals that a big number of Turkish HE institutions (participants) are not really aware of MOOCs.

The survey also sought what kinds of macro-drivers are important for the participant Turkish HE institutions. As can be seen in Figure 3, globalization and internationalization (83.3%), technical innovation push (83.3%), and business models based on 'free' (79.1%) are the important macro-drivers for the Turkish universities for their MOOC offerings or plans. On the other hand, reducing the costs in HE (29.2%) and increasing shared services and unbundling (58.3%) are the least important drivers. Reducing the cost is very understandable for the Turkish universities because



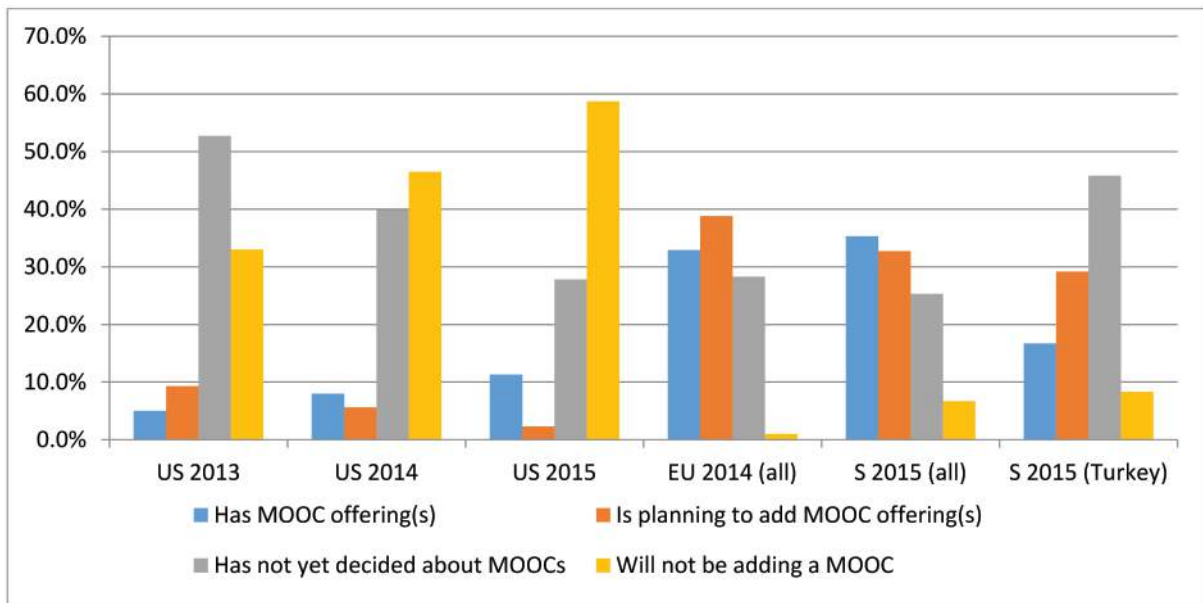


Figure 2: MOOC offerings

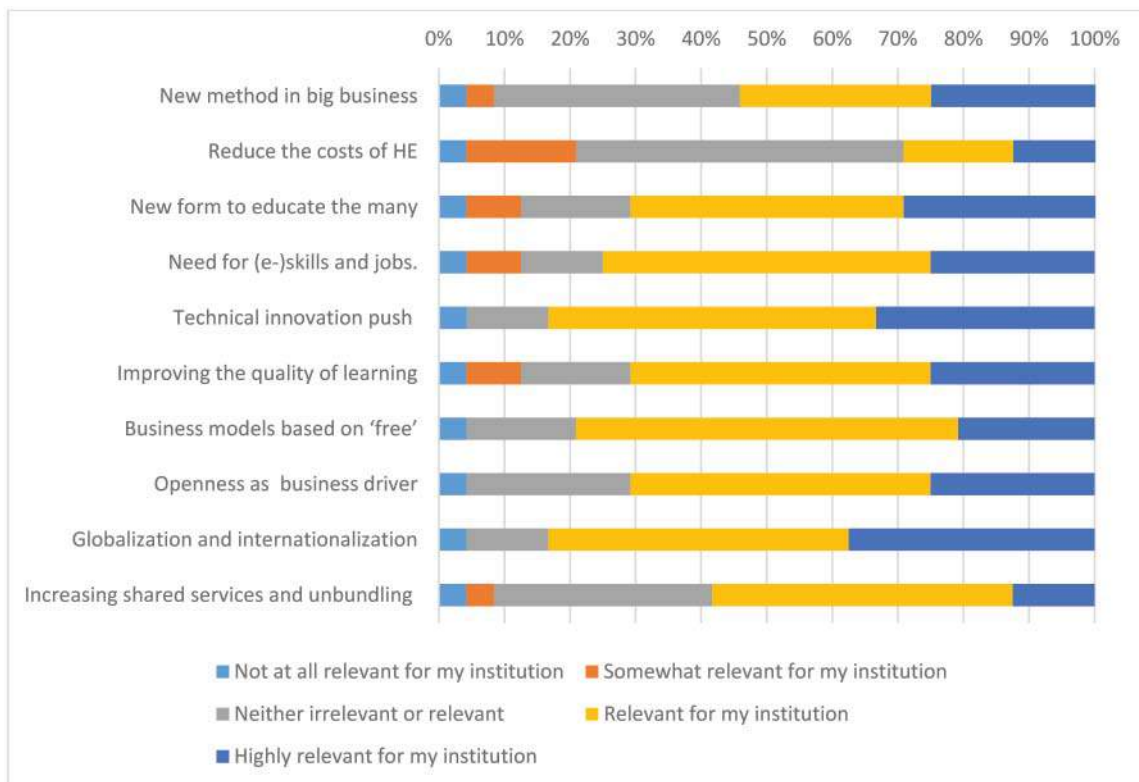
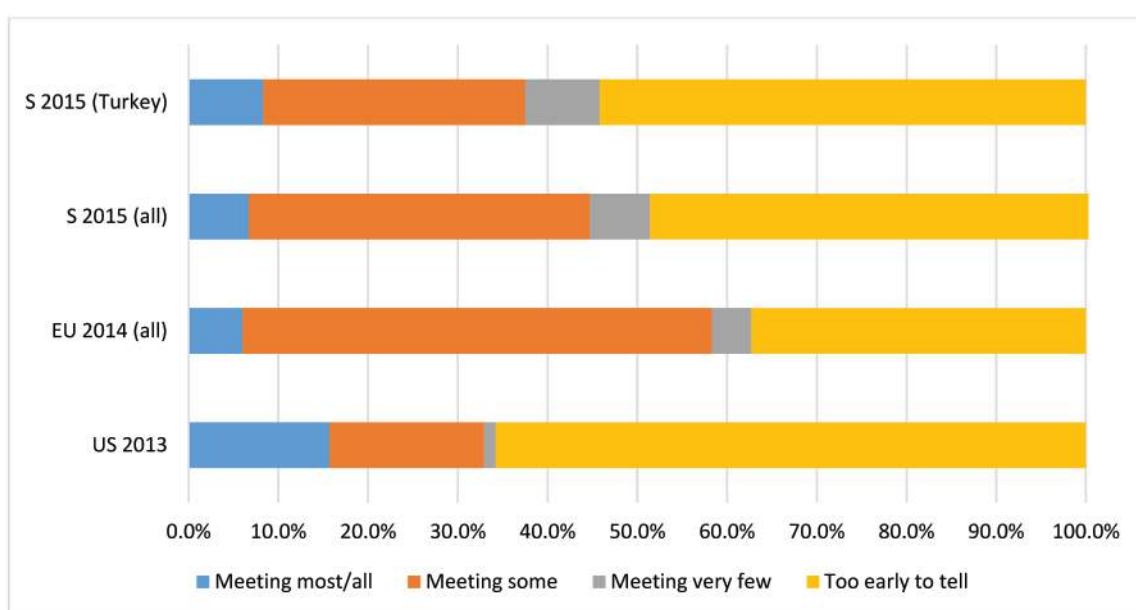


Figure 3: Importance of Macro-Drivers for MOOC Offerings or Plans for the Turkish Participants

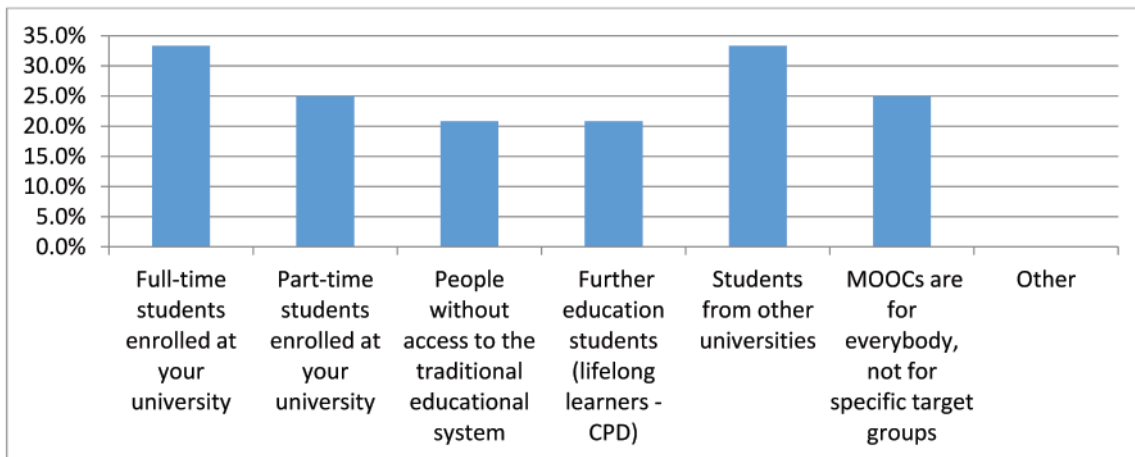
the costs are quite low especially for public universities and even for private ones. The government subsidize almost all the costs for institutions as well as students. The most expensive undergraduate degree costs around 500 Euros per semester for the students. Open and distance learners pay way less. For instance, Anadolu University, the largest ODL provider in Turkey, charges only 75 Euros per semester for all the courses. Result related to unbundling is also understandable. Turkish universities hesitate to collaborate and outsource their major operations due to mainly the legal regulations about their budgets, shortage of sustainable vendors and culture.

In terms of the question regarding the extent MOOCs meet the institutions' objectives (Figure 4), a big majority of the Turkish institutions responded almost the same as US and EU institutions: It is too early to observe. Similarly, some institutions noted that their MOOC offerings meet some of their objectives.

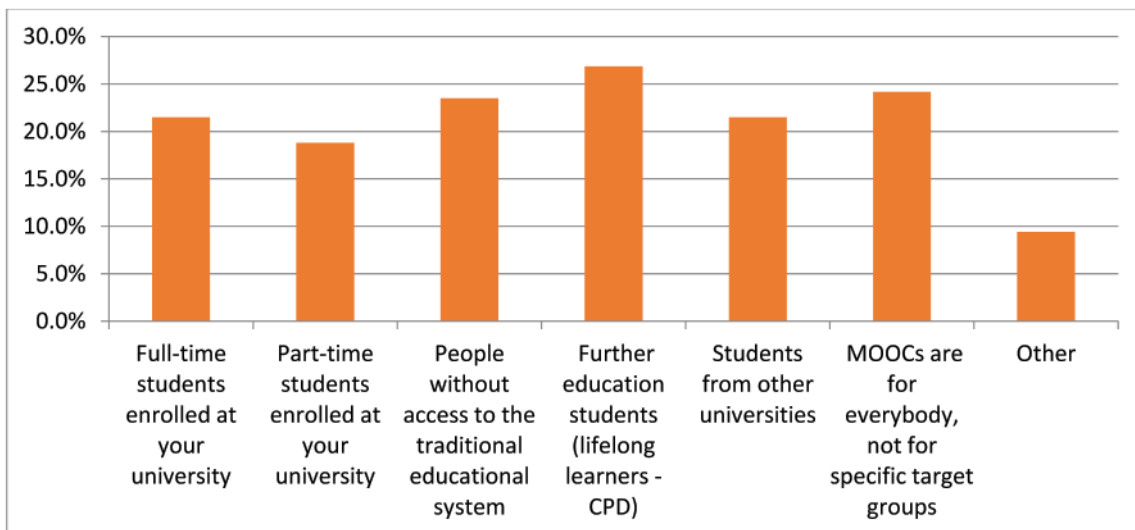


**Figure 4: The Extend MOOCs Meeting the Institutions Objectives**

The Turkish institutions have various perceptions regarding which group should MOOCs be targeting. As can be inferred from Figure 5, although the Turkish HE institutions targets various groups, their main goal is to reach their full-time and part-time students in their own institution and in other universities. Quite a number of them (25%) also believe that MOOCs should be created to serve everybody not a specific target group. This later result is consistent with EU results that a big majority of the participant universities indicated the same concern about target groups for MOOCs. Nonetheless, opposite of the Turkish universities, a big number of EU universities expressed respectively lifelong learners and people without access to traditional educational system as the major target groups for MOOCs (Figure 6). Because majority of the Turkish universities (especially public ones) easily reaches the students they need, they do not feel to reach further education students. Also, a big number of them offers face-to-face training to corporations. Costs of offering free courses is another barrier for institutions to target lifelong learners.



**Figure 5: Target Groups for MOOCs According to Turkish Universities**



**Figure 6: Target Groups for MOOCs According to EU (Including Turkish) Universities**

Meanwhile almost 80% of the participant Turkish universities prefers xMOOCs, or more traditional teacher led online learning. Only one institution noted a hybrid MOOCs (hMOOCs) and 4 cMOOCs. These results are a bit different than the overall results. As can be observed in Figure 7, more cMOOCs and hMOOCs as well as some other types have been offered by the European HE institutions. Since there are a few examples of fully cMOOCs and there is a shortage of knowhow on innovative online pedagogies in Turkey, this might be an understandable result.

In the survey, the institutions were also asked to indicate the impact of MOOCs on their major operations and stakeholders. The results have shown that only a few of the universities (8.3%) indicated no impact on overall the institution while a big majority (54.2%) felt a little and quite an interesting percent (37.5%) high impact (Figure 8). The highest impact was felt on full-time online/distance learners as well as on-campus ones. Academic staff was also signposted as another stakeholder that felt the impact quite high. This can be related to online experience. In other words, MOOCs can provide an online learning and teaching experience.

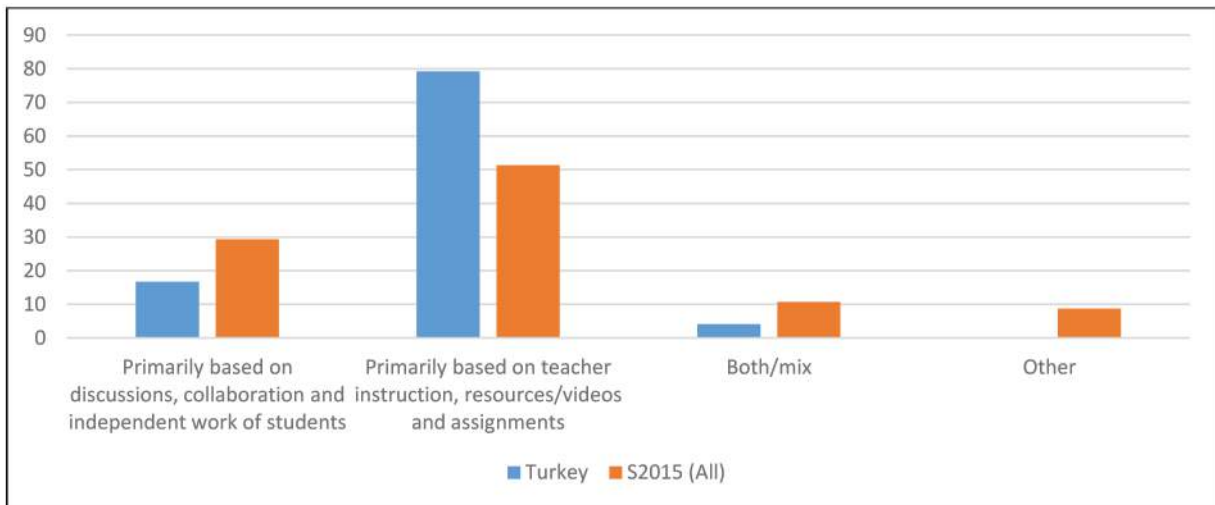


Figure 7: Type of MOOCs

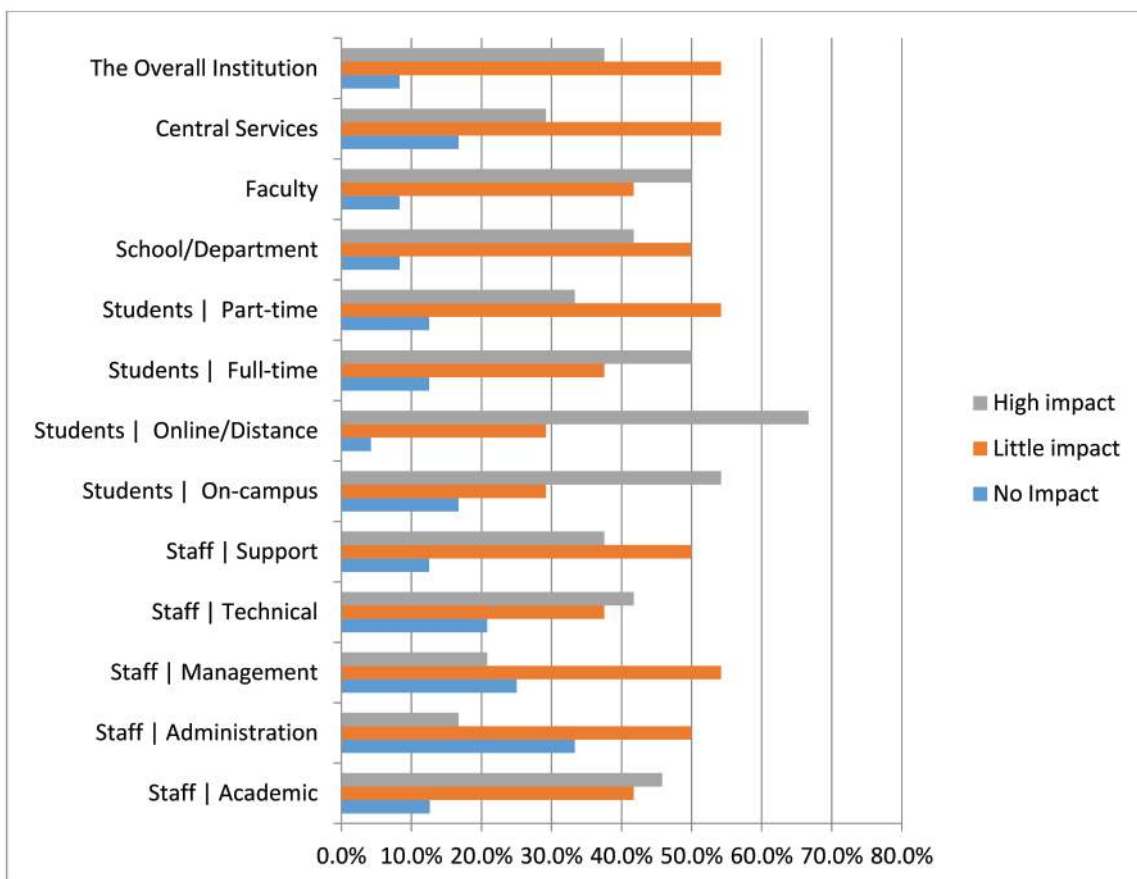
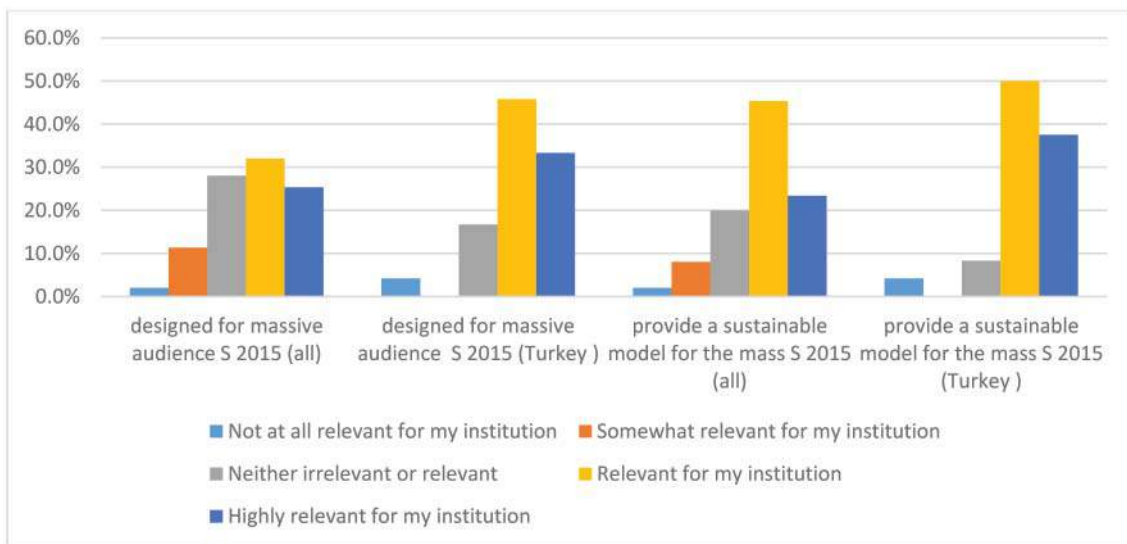


Figure 8: Impact of MOOCs on the Institutions' Operations and Stakeholders

The study also sought the institutions' perceptions concerning the major dimensions of MOOCs: Massiveness, Openness, being Online, and a complete Course. In terms of massiveness, the survey included two questions: First question asked the degree of importance of designing MOOCs for masses while the second asked the institutional relevance of whether MOOCs should provide a sustainable model for masses (for instance, leverage massive participation or a pedagogical model such that human efforts in all services does not increase significantly as the number of participants increases). As can be observed in Figure 9, for Turkish universities designing for masses was a bit more important than the EU average. In other words, 79.1% of the Turkish participant institutions indicated that designing for masses is relevant (45.8% relevant and 33.3% highly relevant) for their institutions while 57% of EU universities (including Turkish ones too) noted as relevant. Accordingly, more Turkish universities stated that MOOCs should provide a sustainable model for the mass than overall EU universities. One of the rationale behind these results might be again HEC's encouragement of universities to offer online learning to increase their revenues. Thus, a number of Turkish HE institutions (63 out of 198) offers distance education to thousands of learners.



**Figure 9: Responses Regarding Massiveness of MOOCs**

In terms of the openness dimension, two major questions were included in the survey instrument on fees. The participants asked to indicate their perceptions regarding how important for their institution to offer MOOCs for free (i.e. without any costs for participants) and also to offer MOOCs that provide an opportunity for participants to get (for a small fee) a formal credit as a component of an accredited curriculum. Similar to the massiveness component (Figure 10), more Turkish participant universities (66.6%) indicated as relevant and highly relevant than the overall EU universities (58%). Interesting distinction between Turkish and overall EU universities is about offering an opportunity for participants to get (for a small fee) a formal credit as a component of an accredited curriculum. For almost all (95.8%) of the Turkish universities this is a highly relevant (70.8%) and relevant (25%) item while one third of the overall EU universities has doubts about this opportunity.

In terms of other questions concerning openness of MOOCs, more Turkish universities than overall EU responded as relevant and highly relevant (Figure 11). The biggest difference between these two parties is in open licensing the MOOCs so that providers and participants can retain, reuse, remix, rework and/or redistribute materials. While 87.5% of Turkish participants found this

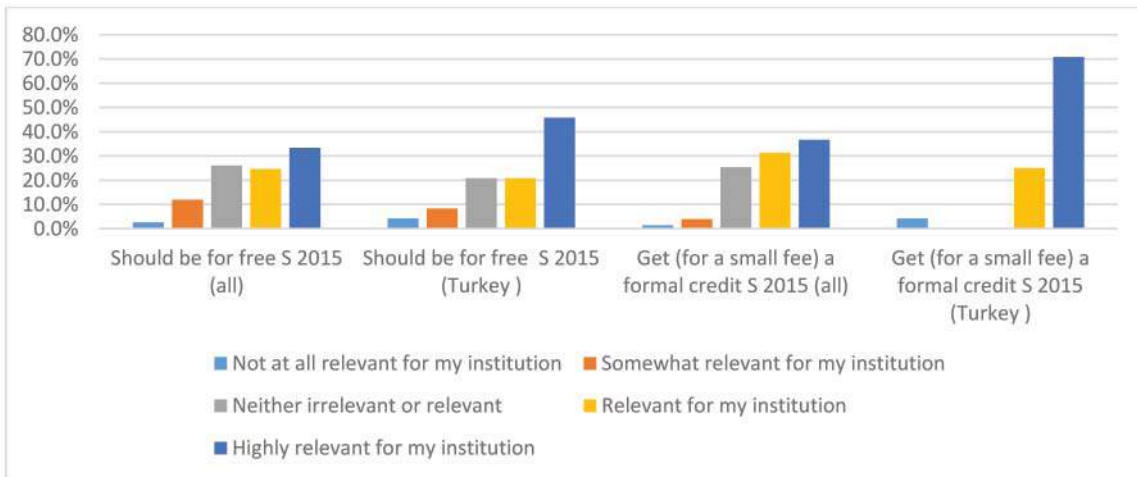


Figure 10: Responses Regarding Participant Fees

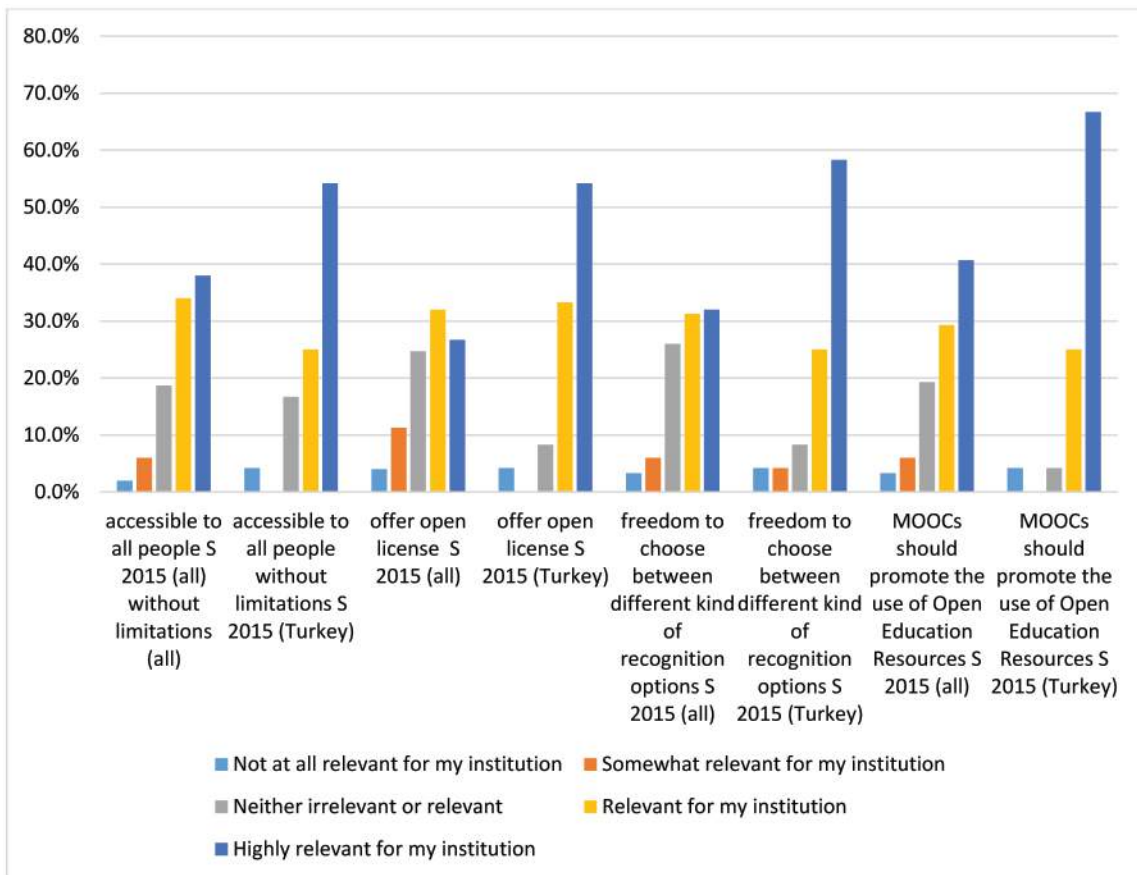


Figure 11: Responses Regarding Openness

item relevant and highly relevant for their institutions, only 58.7% of the overall EU institutions agreed on the relevance. Another interesting finding is about promotion of open education resources (OER) in MOOCs. Almost all (91.7%) Turkish institutions promote this idea of using OER in MOOCs. Additionally, the percentages of Turkish universities and the overall EU concerning the courses' accessibility for all people without limitations are almost identical.

Online in MOOCs refers that all aspects of the course are delivered via online technologies (Jansen & Schuwer, 2015). Related to being online, three items were included into the survey and asked the participants to indicate the degree of relevance of these items for their institutions. The items were: 'MOOCs should offer courses completely online'; 'The final exams of a MOOC for formal credit should be offered online as well'; and 'MOOCs should support off-line access for those with weak network connectivity'. Figure 12 reveals that the majority of the Turkish participant universities and overall EU universities agree that MOOCs should be offered completely online although some have doubts. Offering final exams online for a formal credit was also favored by a larger percent of Turkish universities (83.3%) than overall EU universities (56%). Especially regarding this item one third of the overall EU universities has doubts. A similar finding was also observed about offering off-line access to MOOCs. More Turkish than overall EU participants preferred off-line access to the courses. Among these three questions only the second about online exams is interesting due to the fact that HEC forces all the open and distance learning providers to conduct proctored face-to-face exams rather than alternative assessment strategies and tools. Even, in a recent legal document, HEC asked all the institutions to adapt a strategy that is not pedagogically appropriate: for every four wrong answers, one correct answer must be considered incorrect to be able to reduce the guessing. However, the survey indicates that institutions are in favor of online exams. Additionally, the results regarding off-line access can be explained with limited access to the Internet in rural areas and also the cost of access issues.

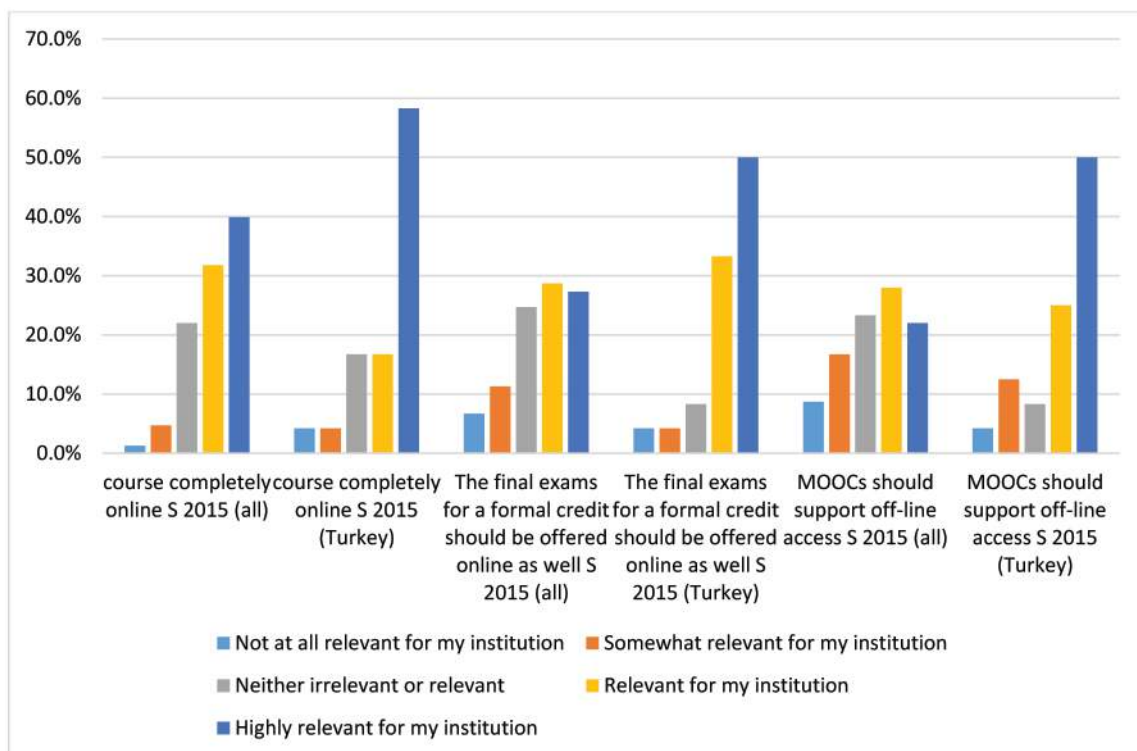


Figure 12: Responses Regarding Online Dimension

Course dimension in MOOCs means a unit of study that targets predetermined and/or emerging learning outcomes, consists of structured and semi-structured learning activities, and a designed learning environment. Regarding this dimension, total four questions were included into the survey. The first two questions were presented to explore the participant institutions preference about pace of learning. The first question asked whether the courses should have fixed start and end dates. Different than the overall EU participant institutions, a big majority of Turkish HE institutions (70.1%) preferred more structured MOOCs (fixed dates). The second question was about whether or not MOOC participants have the freedom to define their own pacing and finish whenever they want. Again, this idea was found relevant and highly relevant for more Turkish universities than overall EU institutions (Figure 13). The results concerning fixed dates for MOOCs can be understandable because the structured processes can be managed easier than others. However, this result conflicts with the results about the pace of learning. This part of the survey needs more in debt analysis.

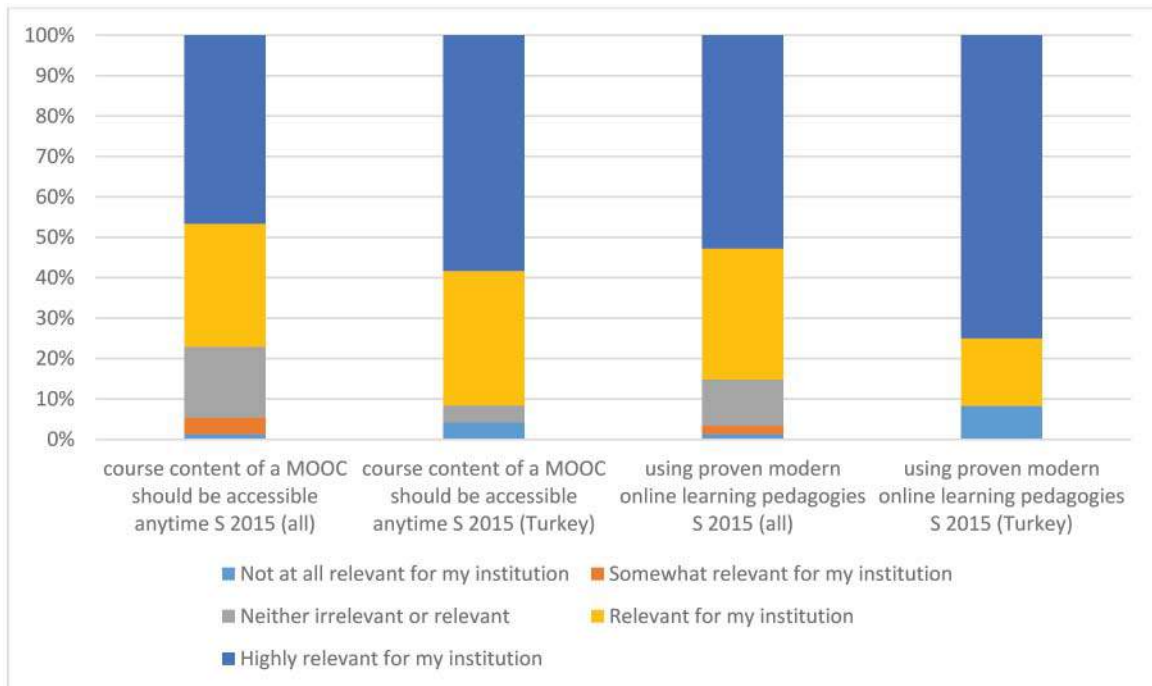


**Figure 13: Self-Paced or Structured MOOCs**

Other two questions on the course dimension were about whether the course content should be accessible anytime (e.g. after the course completed) and MOOCs should be using proven modern online learning pedagogies. As can be seen in Figure 14, 91.6% of the Turkish participants favor the idea that MOOCs contents should be open and accessible anytime. This is again a higher percent than overall EU universities' preferences. The figure also shows that same as overall EU universities, almost all (91.7%) the Turkish participant universities likewise prefer using proven modern online learning pedagogies in MOOCs.

In addition to incentives of the institutions and their perception concerning the dimensions of MOOCs, the study was also sought to uncover the potential collaboration opportunities of the European universities on offering MOOCs. In the survey a list of areas the institutions may want to collaborate with other HE institutions was presented and the participants were asked to indicate their institutions likelihood to collaborate on these areas. Figure 15 presents the results derived from the data collected from the participant Turkish universities.





**Figure 14: Accessibility and Pedagogy of MOOCs**

One of the interesting findings about collaboration between institutions is on selling the MOOC data (e.g., for recruitment, advertisements). Only one third of the participants indicated that their institutions may collaborate on this area. Similarly, translation services (29%), tailored (paid for) follow-up courses (37.5%), authentication services (37.5%), and surprisingly development of MOOC platform (37.5%) seems the least likely collaboration areas. On the other hand, reusing elements (for instance OER, tests) from each other, MOOCs (66.7%) and assessment services (66.6%) are areas the Turkish institutions are open to collaborate. Similarly, new scalable educational services (62.5%), development of MOOC materials (62.5%), networks/communities on MOOCs (62.5%), co-creating MOOCs with other institutions (62.5%), co-creating cross-national educational programs based on MOOCs (62.5%), support services for participants, and branding of a joint (best research universities, etc.) initiative (62.5%) are other areas of collaboration. However, it seems that quite a number of responders have doubts about their qualification for answering this question.

The study additionally included a question to learn the potential outsourcing areas for MOOC initiatives of the universities. The survey provided a list of areas that institutions may want to outsource and the participants were asked to indicate their institutions likelihood to outsource these areas. Figure 19 presents the results derived from the data collected from the participant Turkish universities. Similar to previous question, quite a number of responders indicated that they are not qualified to answer the question (average 25%). Also, it seems that a few Turkish universities may outsource co-creating MOOCs with other institutions (45.8%), co-creating cross-national educational programs based on MOOCs (45.8%), branding (41.7%), new scalable educational services (41.7%), and certification services (41.6%).

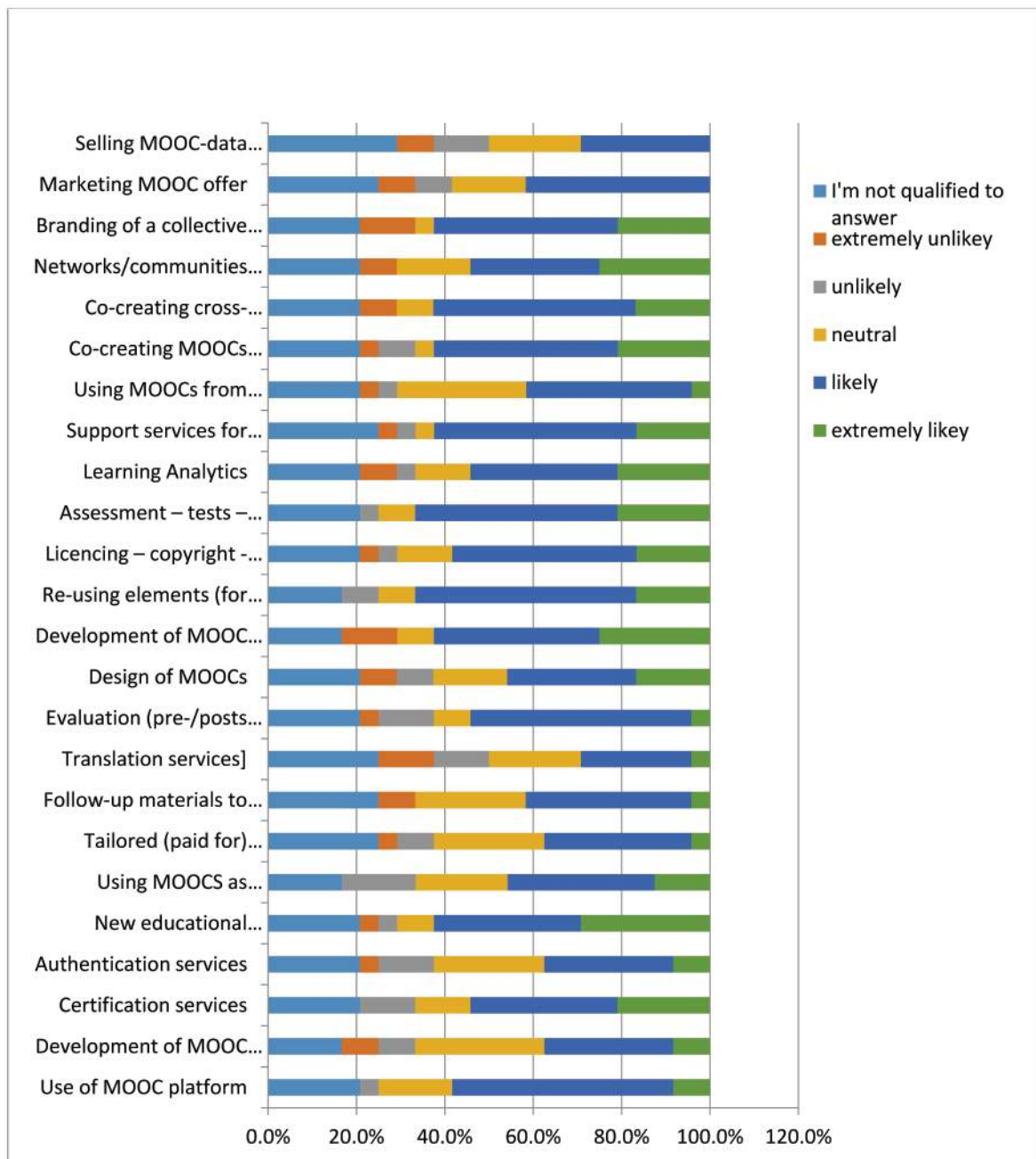


Figure 15: Collaboration Areas for MOOC Offerings According to the Turkish Universities

As can be derived from the last two figures (Figures 15 and 16), a corporate academic mix seems likely to occur in Turkey. Since a large number of online learning (formal academic degree) providers (40 out of 68) are outsourcing their learning management (LMS) and content development processes (Hancer, 2016) this result can be understandable. Moreover, as many Turkish Institutions are going to be involved in MOOCs, the need for a regional cross-institutional collaboration schemes will increase. Especially as most of these HEIs cannot become partner of the big MOOC providers as they apply selective contracting policies to HEIs.

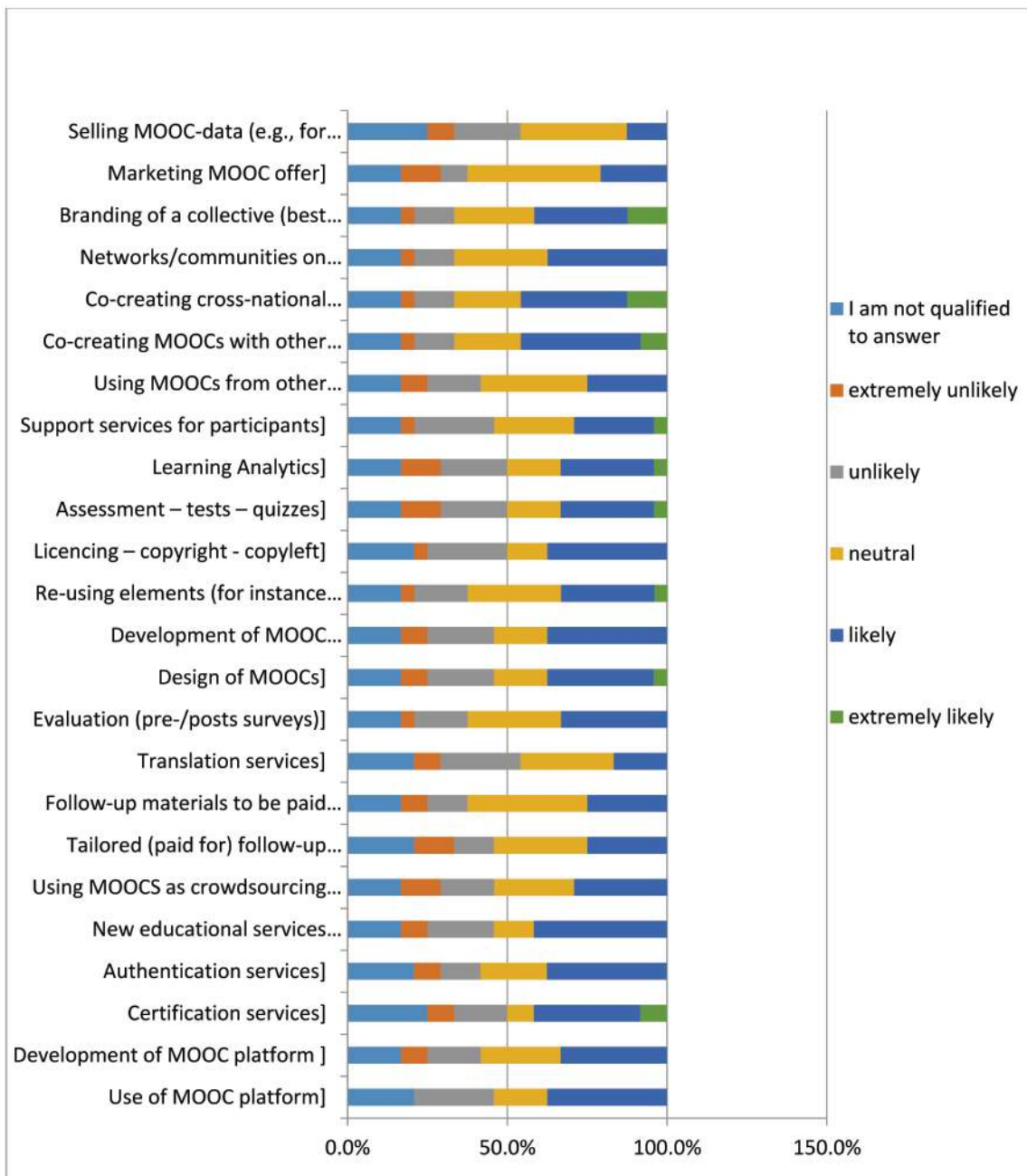


Figure 16: Outsourcing Areas for MOOC Offerings According to the Turkish Universities

## Conclusions and Recommendations

MOOCs are courses designed for large numbers of participants, that can be accessed by anyone anywhere as long as they have an internet connection, are open to everyone without entry qualifications, and offer a full/complete course experience online for free (OpenupEd, 2014). All around the world, there is a growing interest in both supply and demand sides of MOOCs (Bang, Dalsgaard, Kjaer & Donovan, 2016). This study intended to explore the European higher education institutions awareness, perspectives, adaptation strategies and refraining reasons regarding MOOCs.

Findings of this study show that more than half of the participant (54.1%) institutions has no MOOCs or plans to offer one and around 30% has the intention but no actions although the majority of the participant universities has distance education experience. The remaining participants indicated themselves as MOOC providers however investigation of their Web sites uncovers that only one fourth of them are really offering MOOCs and others offer just online courses but not MOOCs. In sum, the study reveals that a big number of Turkish HE institutions (participants) are not really aware of MOOCs. Those universities, on the other hand, that offer MOOCs does this mainly because of international and national visibility.

This unawareness and shortage of adaptation can be related to the following challenges for Turkish HE institutions as well as individuals:

- Language barriers – A big majority of MOOCs are in English and quite a number of Turkish citizens doesn't have English language skills even though the number is decreasing (TEPAV, 2013).
- Recognition – Recognition of prior learning (RPL) is a problematic area in Turkey and there is not enough quantity and quality of standards and regulations (Velciu, 2014). So, the institutions hesitate to recognize the prior learning. Even certificates issued by universities and especially by private institutions (e.g. NGOs, for-profit training centers, etc.) do not have enough reputation and often are not accepted by employees or other institutions.
- Reputation – Reputation of open and distance education is also problematic in Turkey. Due to un-successful past and current implementations, distance learning is not considered as valuable as face-to-face. The Higher Education Council (HEC), a government agency controls and takes all the decisions about HE in Turkey, encourages all the public universities to offer distance education (Latchem et al., 2009). However, the main reason behind this encouragement is related to income. Open and distance learning is considered as a good business rather than a form of delivery of instruction.
- Legislations – Although the government (via HEC) encourages the universities to offer open and distance learning, insufficient and problematic legislations barrier the development of the implementations.
- Knowhow – Although the country has a long history in open and distance learning, a big majority of universities does not have enough knowhow on online learning. In terms of training qualified human resources, there are only two masters (an online and a face-to-face) and one doctorate (PhD) level programs directly focusing on open and distance learning. All these programs offered by Anadolu University.
- Infrastructure – Some professors, experts or even institution are willing to offer MOOCs but they do not have access to the required technological infrastructure (Salar, 2013).

This section of the paper presents several recommendations to the policy makers in institutional and national levels developed based on the survey as well as networking activities conducted during the implementation of the HOME Project, literature and personal experiences.

### **National Level**

The Higher Education Council should take immediate actions to be able to widen the opportunities for accessing the courses offered in formal programs. In order to be able to do so, HEC can start with encouraging the current online learning providers to adapt a *freemium* model, a business model that covers the every-body's access to the course materials with no charge and collecting fees and tuitions from those learners who would like to get credits for their formal education. This opportunity will increase the demand for online learning and at the same time helps the opening up education movement.

Another action HEC should take is about recognition of MOOC completion certificates. Currently, certificates earned outside the learners own institution are often not accepted as a part of formal programs. HEC should establish baseline standards for for-formal-credit MOOCs and graduates of these MOOCs should be able to use the credits they earned into their formal programs.

HEC might work with the Scientific and Technological Research Council of Turkey (TUBITAK) to launch new calls for HE institutions and individual academicians to offer MOOCs. TUBITAK has already been offering some grand opportunities for open courseware projects. Similar funding opportunities can be offered to those who would like to offer MOOCs.

HEC should also encourage institutions to collaborate on MOOC offerings. Especially, those open and distance providers can be used as facilitators or coordinators for bringing close by institutions to establish alliances to offer MOOCs. These kinds of joint-initiatives can be financially supported via TUBITAK. The experienced institutions may only provide support to beginners on how to offer MOOCs and online courses.

HEC should also encourage institutions to offer MOOCs to educate refugees. Because of access to the technology problem, these MOOCs can be just MOC without online component or mobile MOOCs. HEC should provide funding and legal opportunities to the institutions work on innovative ways of offering flexible MOOCs to these groups.

Furthermore, the private initiatives concerning MOOCs should be encouraged by the government. Ministry of Education, Ministry of Science, Industry and Technology, Regional Development Agencies and some other governmental institutions have been providing some funds for lifelong learning projects. They can offer the same opportunities for MOOC initiatives. Especially those projects/initiatives offered by NGOs or civil societies can be prioritized.

Overall, HEC should work on a strategy to open up all the knowledge and expertise in the HE institutions to all the citizens. MOOCs must be considered as a part of this strategy.

### ***Institutional Level***

All institutions should consider offering MOOCs even though they do not have any prior online learning experience. Those inexperienced institutions or institutions with limited technological or other sources can learn from experienced ones. So the decision makers in these institutions should look for collaboration opportunities with the experienced ones or even private initiatives.

Institutions that have been offering open and distance learning should transform their courses into MOOCs and adapt different business models (*freemium*, openness, corporate) to be able to reach more audiences. It is becoming a fact that the more open up their courses the more students come to the formal programs.

Experienced ones should target various target groups including internationals. The number of students looking for education opportunity outside their own countries is increasing. Especially in Turkey, where there is a huge body of refugees from Syria and other countries, decision makers can use MOOCs to offer the educated refugees an opportunity to adapt to the country to implement their expertise and the uneducated ones an opportunity to learn the local culture and even acquire some skills to be able to find jobs or establish an initiative. Funding opportunities are available for these kinds of MOOC offerings even from the EU. Institutions should also offer MOOCs in different languages to be able to reach internationals. For instance, there is a huge potential in Africa, Turkish Republics, Middle East.

Decision makers in the universities should encourage and create opportunities to their professors to open up their course materials and courses. Adapting one financial source will not be enough for sustainability. So, the institutions should work on alternative models.

## Acknowledgements

This research is conducted as part of the European Union-funded project HOME—Higher Education Online: MOOCs the European way—supported by the European Commission, DG EAC, under the Lifelong Learning Programme (Ref. 543516-LLP-1-2013-1-NL-KA3-KA3NW). However, sole responsibility for this report lies with the authors and both the Commission and the HOME partners are not responsible for any use that may be made of the information contained therein.

## References

- Allen, I. E., & Seaman, J. (2014). *Grade change: Tracking online education in the United States*. Babson Survey Research Group Report. Retrieved from <http://www.onlinelearningsurvey.com/reports/gradechange.pdf>
- Allen, E., & Seaman, J. (2015). *Grade level: Tracking online education in the United States*. Babson Survey Research Group Report. Retrieved from <http://www.onlinelearningsurvey.com/reports/gradelevel.pdf>
- Allen, I. E., & Seaman, J. (2016). *Online Report Card: Tracking Online Education in the United States*. Babson Survey Research Group and Quahog Research Group, LLC. Retrieved from <http://onlinelearningsurvey.com/reports/onlinereportcard.pdf>
- Bang, J., Dalsgaard, C., Kjaer, A., & Donovan, M. M. (2016). MOOCs in higher education – opportunities and threats. *Conference Proceedings of the Online, Open and Flexible Higher Education Conference: Enhancing European Higher Education: Opportunities and Impact of New Mods of Teaching* (pp. 543–553). Netherlands: EADTU.
- Daniel, J. (2012). Making sense of MOOCs: Musings in a maze of myth, paradox and possibility. *Journal of Interactive Media Education*, 3. Retrieved from <http://jime.open.ac.uk/articles/10.5334/2012-18/>
- Gaebel, M., Kupriyanova, V., Morais, R., & Colucci, E. (2014). *E-learning in European Higher Education Institutions: Results of a mapping survey conducted in October-December 2013*. Retrieved from [http://www.eua.be/Libraries/Publication/e-learning\\_survey.sflb.ashx](http://www.eua.be/Libraries/Publication/e-learning_survey.sflb.ashx)
- Hancer, A. (2016, May 15). *Personal interview*.
- Herman, R. (2012). The MOOCs are coming. *The Journal of Effective Teaching*, 12(2), 1–3.
- HOME (2014). *Higher education Online: MOOCs the European way*. Retrieved from <http://home.eadtu.eu/>
- Jansen, D., & Schuwer, R. (2015). *Institutional MOOC strategies in Europe: Status report based on a mapping survey conducted in October–December 2014*. EADTU. Retrieved from [http://www.eadtu.eu/documents/Publications/OEenM/Institutional\\_MOOC\\_strategies\\_in\\_Europe.pdf](http://www.eadtu.eu/documents/Publications/OEenM/Institutional_MOOC_strategies_in_Europe.pdf)
- Jansen, D., Schuwer, R., Teixeira, A., & Aydin, H. (2015). Comparing MOOC adoption strategies in Europe: Results from the HOME project survey. *International Review of Research in Open and Distributed Learning*, 16(6), 116–136. Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/2154>
- Kim, B. (2015). What do we know about MOOCs? In B. Kim. (ed.). *MOOCs and Educational Challenges around Asia and Europe* (pp. 3–7). Seoul: KNOU Press.
- Latchem, C., Simsek, N., Cakir, O., Torkul, O., Cedimoglu, I., & Altunkopru, A. (2009). Are we there yet? A progress report from three Turkish university pioneers in distance education and e-learning. *The International Review of Research in Open and Distance Learning*, 10(2). Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/686/1220>
- OpenupEd (2014). *Definition massive open online courses (MOOCs)*. Retrieved from [http://www.openuped.eu/images/docs/Definition\\_Massive\\_Open\\_Online\\_Courses.pdf](http://www.openuped.eu/images/docs/Definition_Massive_Open_Online_Courses.pdf)

- OpenupEd (2016). *About OpenupEd*. Retrieved from <http://www.openuped.eu/>
- Salar, H. C. (2013). *Readiness of higher education faculty and students for open and distance learning*. An unpublished dissertation. Eskisehir: Anadolu University Social Sciences Institute.
- Shah, D. (2016, May 13). *Less Experimentation, More Iteration: A Review of MOOC Stats and Trends in 2015*. Retrieved from <https://www.class-central.com/report/moocs-stats-and-trends-2015>
- Siemens, G. (2013). Massive open online courses: Innovation in education? In R. McGreal, W. Kinuthia, & S. Marshall. (Eds). *Open educational resources: Innovation, research and practice* (pp. 5–16). Canada: Commonwealth of Learning.
- Straumsheim, C. (2017, February 14). The British MOOC invasion. Inside Higher Ed. Retrieved from <https://www.insidehighered.com/news/2017/02/14/british-mooc-provider-futurelearn-expands-us>
- TEPAV (2013, November). Turkey national needs assessment of state school English language teaching. *A report prepared by the Economic Policy Research Foundation of Turkey (TEPAV) and the British Council*. Retrieved from [https://www.britishcouncil.org.tr/sites/default/files/turkey\\_national\\_needs\\_assessment\\_of\\_state\\_school\\_english\\_language\\_teaching.pdf](https://www.britishcouncil.org.tr/sites/default/files/turkey_national_needs_assessment_of_state_school_english_language_teaching.pdf)
- Velciu, M. (2014). Recognition of prior learning by competences' validation in selected European countries. *Contemporary Readings in Law and Social Justice*, 6(1), 217–222.
- Walton, M. (2016, February 10). *Welcoming 3 million people to FutureLearn*. Retrieved from <https://about.futurelearn.com/blog/welcoming-3-million-people-to-futurelearn>

## Analysis of Student and Faculty Perceptions of Textbook Costs in Higher Education

Michael Troy Martin , Olga Maria Belikov , John Hilton III ,

David Wiley  & Lane Fischer 

*Brigham Young University (USA)*

[troy\\_martin@byu.edu](mailto:troy_martin@byu.edu), [olgabelikov@byu.edu](mailto:olgabelikov@byu.edu), [johnhiltoniii@byu.edu](mailto:johnhiltoniii@byu.edu),  
[david.wiley@byu.edu](mailto:david.wiley@byu.edu) & [lane\\_fischer@byu.edu](mailto:lane_fischer@byu.edu)

### Abstract

The cost of textbooks has continued to impact students in higher education. Students have reported that they make decisions on which courses to take based on the specific cost of textbooks. Faculty have reported willingness to use open textbooks to help ease the burden on students but are unsure where to find viable options. We examined the responses of 676 students and 573 faculty from a large private university (Brigham Young University, Provo, Utah) to understand the real impact of textbooks costs to students and how they are dealing with this ongoing problem. We found that 66% of students at this institution have not purchased a textbook due to cost. We also discovered that 91% of faculty at this institution would be willing to use OER alternatives and that 53% of them would welcome assistance identifying and adapting materials for their course.

**Keywords:** Cost of higher education; open educational resources; open textbooks; OER

### Introduction

Textbooks have been a key pedagogical tool in the United States since the early 1800s, and educators have long been interested in providing the highest quality textbook possible to their students (Brandt, 1964). Textbooks are often the primary method of distributing course content and learning material to students. When selecting appropriate textbooks teachers are often faced with two challenges: access to quality material (Oakes & Saunders, 2002) and adapting the materials to fit their needs (Williams, 1983, p. 251).

Although textbooks are an integral element in the educational process, there is still considerable debate on what constitutes a quality textbook. Textbook evaluation has been researched and discussed in the context of pedagogical improvement for many years, including the work of Franzen & Knight (1922) which is nearly a century old. Various scholars have suggested different ways to help teachers become more systematic and objective in their selection approach (Chastain, 1971; Tucker, 1975; Candlin & Breen, 1979; Daoud & Celce-Murcia, 1979; Williams, 1983; Sheldon, 1988; Skierso, 1991; Ur, 1996; Littlejohn, 1996).

One aspect of textbook adoption in higher education that bears scrutiny is their cost. The average college student in the United States now spends over \$900 per year on textbooks (Allen, 2010). This expense can be a large fraction of the overall cost of a college degree, particularly at community colleges. Indeed, the increasing textbook costs are making a college education prohibitively expensive for many students (Kingkade, 2011). Partly in response to the rising cost of textbooks, Open Educational Resources (OER) have been developed to reduce the cost of educational content, including textbooks. Recent research has shown that high quality, openly licensed textbooks can be made available to students at dramatically reduced costs, potentially eliminating the textbook barrier to a college education (Caswell, 2012).



The proliferation of OER provides a new option for evaluating, selecting and adapting textbooks. Open textbooks are OER that allow students and educators free access to openly licensed educational content. In most instances, open textbooks are licensed to allow teachers to modify the content and customize it for use in their own teaching environments.

University professors, as well as K-12 teachers, schools, districts and states, are now able to draw upon OER to retain, reuse, revise, remix, and redistribute course textbooks at dramatically reduced costs (Wiley, 2014). These open textbooks can also be iteratively improved by the authors from year to year or from course to course. To make these improvements most effectively, educators need data about textbook efficacy and training on how to adapt them.

While OER enables teachers to adapt material to better suit the needs of their students it can also provide an opportunity for students and school districts to save substantial amounts of money by eliminating the need to purchase expensive textbooks (Bliss, Hilton, Wiley & Thanos, 2013; Hilton & Wiley, 2011). In the present study, we sought to first explore college students' perceptions of the costs of textbooks and potential impact of adopting OER. We then discuss faculty members' willingness to consider open textbooks as a viable solution to textbook costs.

### ***Students and the Costs of Higher Education***

Rising costs of higher education in the United States have made it so that the percentage of the cost of college borne by students (as opposed to government) has risen from 33% to more than 50% over the last 30 years (The Pell Institute, 2015). Between 2004 and 2012 the total student debt in the United State nearly tripled from \$364 billion in 2004 to \$966 billion in 2012 (Lee, van der Klaauw, Haughwout, Brown & Scally, 2014). These costs have risen so rapidly that the federal government has created a College Scorecard project, in order to help students better understand the costs associated with attending various colleges (Whitehouse, 2016).

Textbooks are a significant part of the costs facing students, and in some instances, such as community colleges, can be even more expensive than tuition. The College Board (2013), estimated that full-time students at public two-year colleges spend \$1270 per year on textbooks and course supplies. In contrast, two semesters of tuition at California community colleges cost \$1104 (assuming twelve credits taken each semester). The cost of textbooks can be extremely troublesome for students; Selnack (2014) surveyed 2,039 college students from more than 150 different university campuses and found that 93.6% were concerned with textbook costs and that nearly half reported that textbook costs influenced the classes they took each semester.

Perhaps most significant is the impact that textbook costs can have on student academic behavior. The Florida Virtual Campus, which combines 12 public universities and 28 public colleges across Florida, conducted a survey (2012) of 22,129 university students and found the following:

- 63% of students reported not having purchased a required textbook due to cost,
- 35% reported taking fewer courses because of the financial impact of high textbook costs,
- 14% reported dropping a course because of the financial impact of high textbook costs
- 10% withdrew from a course because of the financial impact of high textbook costs

### ***Faculty Perceptions of Open Textbooks***

While there are many aspects to the costs of higher education, the typical professor cannot do anything about them (e.g. the cost of tuition). However, many faculty members do control the textbooks that they assign. Because open textbooks are free, faculty adoption of open textbooks can significantly decrease costs for students. One persistent challenge is that many faculty members are not aware of OER. Allen and Seaman (2014) surveyed a nationally representative sample of

2,144 college faculty members in the United States and found that only 34% of respondents were aware of OER. Moreover, they found that proven efficacy and trusted quality were the most important factors for faculty in determining which textbooks to adopt.

In terms of quality, faculty who have used OER have expressed positive perceptions of the quality of the OER textbooks they have used in multiple studies (Bliss et al., 2013). Moreover, Hilton (2016) examined nine efficacy studies when OER were substituted for traditional textbooks, and found that students using OER did as well as or better than students using commercial products. The mantra that “you get what you pay for” does not actually apply to the use of OER.

In a similar perception-study of 80 teachers, Bliss et al. (2013) found that only 9% of teachers reported negative impressions of the OER material they used, while 34% stated that the open textbooks were better and 55% said they were the same. They also found that more than 20 percent of the positive teacher comments reflected a feeling that the cost of the OER textbook was better both for the students and for them as instructors as well. In addition, a third of teacher comments praised the customization and adaptability of OER material.

From the existing literature, it appears that students have been deeply concerned with the cost of textbooks and report that these costs negatively impact their academic performance. Faculty who have used open textbooks seem to value them, and yet approximately two-thirds are not aware of them. In the present study, we sought to better understand student and faculty feelings regarding cost and open textbook adoption. While some of our questions replicate, and confirm what has previously been done, we also explored how students perceive that they would spend the money they saved if they did not have to purchase textbooks as well as the willingness of faculty members who have not previously used open textbooks to begin using them. Specifically, this study was guided by the following primary research questions:

1. How do students perceive that textbook costs influence their academic success?
2. What would students do with the money they saved if they didn't buy textbooks?
3. What are students' general feelings about textbook costs?
4. What percentage of faculty were willing to consider using open textbooks?
5. What percentage of faculty wanted help finding open textbooks?
6. Why do faculty members say they would or would not be willing to use an open textbook?

## Methodology

To investigate these questions, we gathered data from two separate surveys (one for faculty  $n= 2417$ ) and one to ( $n=3115$ ) that were administered between February and March of 2016. This survey took place at Brigham Young University (Provo, UT), a large private religious university located in the United States. Faculty participants were asked questions about their perception and understanding of OER as it pertains to textbooks and textbooks usage. Student participants were randomly selected juniors and seniors and consisted of a variety of different majors and academic foci. They were surveyed regarding textbook costs and what they would do with money saved from offset costs were OER to be adopted.

## Data Collection

The evaluation instrument included fixed response and open-ended questions to allow for free response feedback from the students and faculty. These open response comments were analyzed and coded for patterns as to what students might do with the money they saved by using OER textbooks. Faculty responses as to why they would/would not use OER textbooks were also coded to further understand the implications of their responses.

## Instruments

Our instruments (see Appendix A for a copy of both the student and faculty survey) were drawn from previously peer-reviewed tools based on a similar study conducted by Bliss, Robinson, Hilton and Wiley (2013) as well as by Florida Virtual Campus (2012). The questionnaires were developed by a measurement expert to help ensure validity and reliability. The student survey included 14 questions, three of which were open response. While the first 13 questions dealt directly with the subject of textbook costs, the final question allowed the participants to provide any additional thoughts or comments on the subject.

The faculty survey had 18 questions of which 8 were open-response. It should be noted that in this survey an 'open textbook' was defined as "...digital textbooks that are (1) free of charge and (2) provide faculty with permission to make a wide range of changes, customizations, and improvements." We acknowledge that open textbooks are available in printed formats; however, since most open textbooks are used digitally, we used this simplified definition.

## Data Coding Procedures

For open-ended questions a coding schema was developed by two individuals to analyze the information provided. After reviewing all the responses, we identified several categories. Responses were reviewed and grouped into these categories. We arrived at the final codes after multiple iterations.

For the faculty survey the key open-ended questions related to their willingness to use or not use open textbooks', specifically--why they *would* and *would not* be willing to use them. As the question was analyzed: "Why *would* you be willing to use an open textbook?", many responses also included reasons why they would *not*.

We conducted a knowledge-based sentiment analysis (Ortony, Clore & Collins, 1990) to gather information on general perceptions, and then implemented exploratory coding procedures to search for emergent themes across student and faculty responses. The data were coded by multiple researchers to try to accommodate for reviewer interpretation of results.

## Results

### Student Findings

Eight themes emerged for the question, "If you didn't have to pay for textbooks, how would you use the money you saved?" These themes were used to create related codes as shown in Table 1.

**Table 1: Comment Codes and Grouping for Student Responses**

Code #	Code Name	Key Coding Words and Phrases
1	Housing	Rent, room, housing costs.
2	Food	Food, groceries, board, meals
3	Savings and debt reduction	Savings, investments, pay off debt
4	Transportation	Gas, car repairs, transportation needs
5	Health	Dr. bills, prescriptions
6	Education	Upgrade computer, supplies, pay off loans
7	Clothes	Clothes, new shoes
8	Recreation	Travel, dates, social activities

### ***How do students perceive that textbook costs influence their academic success?***

The total number of student respondents that fully participated (i.e. students who answered each question) in the survey was 676 (for a response rate of 21.7%). The survey was voluntary and not associated with a specific class, or assignment. Students said that on average they paid \$100 per textbook, which, depending on the number and type of classes taken could be about \$1,000 per year. In total, 66% of students said they had not purchased a textbook because of its cost. Of those students, 47% said that not purchasing the textbook negatively affected their grade in the class (representing 28% of all respondents). In a free response section, one student directly commented on this issue, stating, “The \$200–600 I save every three months is worth dropping a half GPA point.”

Perhaps even more significantly, 86% of students said that they have delayed purchasing a textbook because of cost and of those 52% believe that delaying this purchase negatively affected their grade in the class. In terms of time to graduation, it may be significant that 20.6% of students reported they had registered for fewer courses because of related textbooks costs. In addition, 33.28% of students said they had delayed taking, or had not registered for, a specific section of a course because of textbook costs.

### ***What would students do with the money they saved if they didn't buy textbooks?***

Students were asked in an open-response format what they would spend their money on if textbooks were free. As expected, there was a wide variety of responses given by the 651 students who chose to share what they would do with the money that could be saved if they weren't required to purchase textbooks. In reviewing these responses 8 separate themes emerged as outlined in table 2. Because each comment could conceivably receive multiple codes, the total number of comment codes exceeds the number of actual comments.

**Table 2: Comment Codes from Student Open Response**

<b>Comment Category</b>	<b>Number of Times Coded</b>	<b>Percent of Total Codes</b>
Housing	323	28.86%
Food	317	28.32%
Savings	230	20.55%
Education	119	10.63%
Transportation	58	5.18%
Recreation	48	4.28%
Health	15	1.34%
Clothes	9	0.80%

Housing made up 28.86% of the open responses that were given. Most students have housing costs and expressed that they would redirect any savings to housing costs. The savings, however are only a fraction of typical housing costs, so it was unclear how the degree financial savings from using OER textbooks would help offset that cost. However, upon examining the responses, the following comment exemplifies the sentiment shared: “To pay for housing and food so that I didn't have to work as many hours. It would positively influence my ability to focus on school and creating opportunities for post-graduation.” In other words, saving money on textbooks would enable the students to work less hours and help offset the cost of housing.

The second category was that of using the savings to purchase healthier food--especially, fresh fruits and vegetables which can be expensive. Students expressed that they had encountered times when they were forced to choose between food expenses and textbook costs. Examples of comments that reflect this include the following: "To eat healthier. I would spend more money on good food."

Students also commented that if they could save money on textbooks that they would use those savings to pay off student loans, or simply put the money in savings. This finding showed that money is often put towards education either directly or indirectly. The following response reflects this intent:

"I have a family. I would use it for better groceries, clothing needs or shoes, but most of the time the money is from a loan. If I didn't have to get textbooks, I could get smaller school loans. That would be incredible."

### ***What are students' general feelings about textbook costs?***

At the end of the survey students were invited to share any final thoughts that they had about textbook costs. Out of the 653 students who completed the survey, 601 (over 92%) provided feedback in the free response portion that asked for their general comments about textbooks. Of these comments, 12 (1.5%) were positive, 44 (7.3%) were neutral, and 325 (54.1%) were negative statements. Furthermore, an additional 223 (37.1%) were categorized as extremely negative. Positive comments were overwhelmingly conditioned on textbook cost and quality, such as "I understand, to a point, why textbooks are so expensive. I have no problem paying 100–200 dollars per textbook," and "I appreciate keeping textbooks when it was a good, thought out, well written choice." Neutral comments tended to offer the student's alternate approaches to obtaining textbooks or class materials without discussing the cost of textbooks. For instance, one student stated, "I like how you can rent textbooks for a semester," and another remarked they "like when teachers use free online articles instead."

Negative statements reflected many student frustrations, especially regarding the bookstore buy-back, teachers insisting on students having the newest editions, and being required to purchase textbooks that rarely were used. Examples of negative responses include, "Often a professor requires a costly textbook that we can't sell back for hardly anything. Sometimes I buy a textbook and we don't even use it," and "New editions don't usually change enough to be worth the cost." Extremely negative responses differed from negative responses in the intensity of diction and subject matter. One student described, "It is absurd to ask students to pay for books when perfectly viable resources exist online for free." Other response asserted, "Textbooks are the biggest scam targeting the poorest demographic. Requiring specific editions is a gross abuse of power for monetary gain" and "THEY ARE COMPLETELY RIPPING YOU OFF. Someone along the line is greedy. Why do we need to keep having the most updated versions? I just hate it all." The sentiment analysis showed that students had strong opinions regarding textbook costs that were especially directed towards traditional textbook publishers.

### ***Faculty Findings***

Six specific themes emerged from coding and analysis of the faculty responses. The Faculty Survey Table 3 lists the final codes as well as their generic grouping used in the present study.

**Table 3: Comment Codes and Grouping for Faculty Responses**

Code #	Code Name	Key Coding Words and Phrases
1	Save money	Save money, reduce costs to students
2	Equal quality	Equal quality, suitable, well developed
3	Variety	Change, different, new
4	Convenience	Digital, easy to access, keep
6	Customize content	Modifiable, update, keep current

### ***What percentage of faculty were willing to consider using open textbooks and would like help identifying them?***

In total, 573 of faculty members completed this survey for a response rate of 23.7%. Participants were asked to share the courses that they taught, their age as well as their current rank or position with the institution. A breakdown of academic rank of participating faculty is as follows: professor (30.18%), associate professor (29.47%), assistant professor (20.00%), and adjunct faculty (20.35%).

While an overwhelming majority (90%) of respondents were open to the notion of using open resources, it was contingent upon the OER being 'suitable', or at least equal in quality to what they were currently using. For those indicating that they would be willing to using OER replacements for their classes almost 69% were not aware of specific OER alternatives to the materials. However, 53% of faculty who were willing to use open textbooks indicated that they would appreciate help in finding and identifying open textbook alternatives.

### ***Why do faculty members say they would be willing or not willing to use an open textbook?***

Faculty could share open responses as to why they would or would not be willing to use open textbooks. We created six main themes as outlined in Table 4. Of the total number of faculty that participated in the survey (574), 83% chose to share their comments (474) and feelings on why they would be willing to use OER materials. These responses were collected and grouped into six distinct categories. The desire by the faculty to save students money, or to alleviate the cost of education represented a majority (74%) of the responses. Examples of this sentiment include comments like: "...anything to save the students money..." and "...to help reduce the financial burden to students...".

The second theme (25% or 121 of the comments) that emerged had to do with the notion that OER content had to be equal to the material that they were currently using. Responses in this area include comments like: "I don't mind using OER if it is of equal quality", "The content must be suitable to what I am currently using", and "If the OER textbooks are well developed with adequate exercises and sample problems." It was interesting to note that 13% of faculty were also interested in providing students (OER) materials in order to improve accessibility.

**Table 4: Comment Codes for Faculty Open Response**

Comment Category	Number of Responses	Percent of Total (responses)
Save students money	350	74.15%
Equal quality	121	25.63%
Convenient access	62	13.13%
Ability to customize content	50	10.59%
Variety in classroom	26	5.51%

There were seven (less than 1% of total) responses from faculty to the question as to why they would *not* use open resources. This response was underwhelming as compared to the responses that expressed positive sentiment towards OER. These comments focused on a few common themes such as the lack of time, lack of technology and the lack of practice exercises. The comments suggest some common misconceptions regarding OER and included statements like the following: “I don’t want to invest the time to rebuild my course.” And that the lack of certain technologies like wireless networks would prohibit the use of OER because “. . . wireless isn’t available in [my area of] our building. . .” or that the use of electronic devices would cause “. . . a unique cognitive burden of distraction. . .”. These comments suggest that there is an opportunity to educate some on what OER is and how both students and faculty can benefit from its use. The notion that OER implies a tethered, or digital-only requirement supports the opportunity that more information, or formal training is needed.

## Discussion

This study could highlight some perceptions and feelings about student textbook costs and faculty perceptions of the same. Students reported that they would use the savings that open textbooks afford them to address personal financial needs including housing and healthy eating choices. Students also would redirect this money into reducing debt and furthering their education. As in the Florida Virtual University (2012) report students reported that textbook costs negatively affect their academic performance. They also report postponing taking certain courses because of textbook prices. Perhaps most significantly, registering for fewer courses causes students to delay graduation and can add to the overall cost of their education. The aggregated influence of approximately one-fifth of all students taking fewer courses because of textbook costs can be significant. The potential impact of money saved for students would improve quality of living, decrease cost of education, and would often be invested into educational pursuits.

The impact at Brigham Young University was generally smaller than that reported by Florida Virtual Campus (2012). This may be because Brigham Young University is a highly selective private school. The availability of “all you can eat” full-time tuition tiers at Brigham Young University, compared to community college contexts where students pay for each credit, likely contributes to this difference as well. We find it noteworthy that, even in the context of a highly selective private school, textbook costs have a significant impact on students. It is interesting to note that the data obtained in this survey is like the findings of the Florida Virtual Campus in which 63% of students surveyed in Florida did not purchase the suggested course textbook because of price. Similarly, in our study, 66% of students at this institution made a similar choice and choose to not purchase the textbook suggested because of cost. These findings broadly suggest that students at this institution make similar choices

as the students surveyed in the Florida Virtual Campus survey in that they are aware of the cost of textbooks and make decisions as to whether they will, or will not, purchase course material based on price.

The fact that over one third of the students select specific sections of a course because of textbook costs is intriguing because it implies that textbook cost may be playing a larger role in student life than faculty realize. Institutions should consider providing faculty support in evaluating and adopting open textbooks because improved student performance and quicker graduation rates would benefit the institution.

It was not surprising to learn that students did not appreciate high textbook costs, but the volume of extremely negative responses indicates that many students feel like they are being exploited in the system of higher education. The various stakeholders need to realize the deep sense of frustration experienced by many college students.

The responses from faculty show that most are willing to use open textbooks but would like to have some direction and/or training on how to use them. The prevailing attitude was an acknowledgement that textbook prices are high and faculty feel sympathy for the cost burden that is placed upon students. Faculty would like to help students offset the cost of education and are open to exploring the use of OER. Although the barriers of adopting OER are high, faculty who are aware appear to be willing to invest in adopting OER with the proper institutional support. The implications of this are that awareness of OER is still low and needs to be increased, and support for implementation needs to be supported by the institution because the desire to explore OER for student benefit exists.

While our study did not focus directly on the impact of open textbook adoption on student achievement it is an extremely important outcome for future studies. It would be equally interesting to explore how students leverage OER after their time with an institution and how that affects their lifelong learning pursuits and interests. Future research should look at not only the differences in student success rates across teachers and across time but also how and if they chose to continue to access OER for areas of interest of their own choosing. In other words, does the practice of using OER affect their study after they leave the institutions of formal study.

## Conclusion

We acknowledge that this study has several limitations. First, this study relies solely on self-report data and does not examine actual student behavior. For example, these data do not clearly demonstrate that students who save money on textbooks truly take additional courses. Additional studies should focus on confirming these changes in student behaviors (Fischer, Hilton, Robinson & Wiley, 2015). Second, this survey focused primarily on student and faculty perceptions of costs related to open digital texts; it would be interesting to explore whether faculty perceptions would have changed had the possibilities of open printed materials been explored.

Another key limitation is that this study took place only at one university and only involved specific class levels of students on campus. Several comments and feedback given reflected the notion that underclassmen (Freshmen and Sophomores) may spend more money on core, or required coursework. It would also be interesting in a future study to evaluate the open responses of both the faculty and students and determine if the textbook costs vary, or are the similar, between different majors and across academic disciplines. Additional studies would probably benefit from gathering data from multiple institutions and from different student types and demographics across the United States and other locations.



This study revealed some key perceptions and feeling of faculty and students toward OER. The potential impact from an academic perspective that 66% of students surveyed say that they have not purchased a textbook because of cost. Of those, 47% say that not purchasing the textbook negatively affected their grade in the class. In a similar trend, 86% of students say that they have delayed purchasing a textbook because of cost and of those that delayed purchase 52% report that this negatively affected the grade received. 37% of students reported that they have dropped a course because of textbook costs and 21% have registered for fewer courses. 4% of students in the survey say that not being able to purchase a textbook because of cost has caused them fail or withdraw from the course. Clearly the cost of textbooks can impact academic progress when students delay taking courses or withdraw altogether from classes in which they are enrolled.

The study revealed that 83% of faculty surveyed are aware of the price of the textbooks they require students to purchase. Of total responses, 69% were not aware of OER alternatives and of that number 53% would appreciate help identifying suitable alternatives. Most revealing, however, is that 91% of the faculty in this survey said that they would be willing to use an OER materials in the classroom.

Using OER textbooks can decrease the total cost of education for students and potentially improve graduation rates. Faculty are willing to use OER to reduce the financial burden placed on students but would welcome assistance in locating and adapting suitable OER alternatives.

## References

- Allen, N. (2010). *A cover to cover solution: How open textbooks are the path to textbook affordability*. Retrieved from <http://www.studentpirgs.org/textbooks-reports/a-cover-to-cover-solution>
- Allen, I. E., & Seaman, J. (2014). *Opening the curriculum: Open educational resources in US Higher Education, 2014*. Babson Survey Research Group.
- Bliss, T. J., Hilton III, J., Wiley, D., & Thanos, K. (2013). The cost and quality of online open textbooks: Perceptions of community college faculty and students. *First Monday*, 18(1). <https://doi.org/10.5210/fm.v18i1.3972>
- Bliss, T., Robinson, T. J., Hilton, J., & Wiley, D. (2013). An OER COUP: College teacher and student perceptions of Open Educational Resources. *Journal of Interactive Media in Education*, 2013(1), 1–25. <http://doi.org/10.5334/2013-04>
- Brandt, L. W. (1964). How does one select an introductory textbook? *Contemporary Psychology*, 9(8), 332–332. <https://doi.org/10.1037/007645>
- Candlin, C. N. & Breen, M. P. (1979). Evaluating, adapting and innovating language teaching materials. In C. Yorio, K. Perkins and J. Schacter (Eds.) *On TESOL '79: The learner in focus* (pp. 86–108). Washington, D.C.: Teachers of English to Speakers of Other Languages.
- Caswell, T. (2012). The Open Course Library of the Washington State Colleges. In D. G. Oblinger (ed.). *Game changers: Education and information technologies* (pp. 259–262). Washington D.C.: Educause.
- Chastain, K. (1971). *The development of modern language skills: Theory to practice* (pp. 376–384). Philadelphia: The Center for Curriculum Development, Inc.
- College Board (2013). *Trends in college pricing 2013*. Retrieved from <https://trends.collegeboard.org/sites/default/files/college-pricing-2013-full-report.pdf>
- Daoud, A. & Celce-Murcia, M. (1979). Selecting and evaluating a textbook. In M. Celce-Murcia & L. McIntosh (Eds.). *Teaching English as a second or foreign language* (pp. 302–307). Cambridge, MA: Newbury House Publishers.

- Fischer, L., Hilton III, J., Robinson, T. J. & Wiley, D. (2015). A multi-institutional study of the impact of open textbook adoption on the learning outcomes of post-secondary students. *Journal of Computing in Higher Education*, 27(3), 159–172. <https://doi.org/10.1007/s12528-015-9101-x>
- Florida Virtual Campus. (2012). *2012 Florida Student Textbook Survey*. Tallahassee, FL. Retrieved from [https://florida.theorange grove.org/og/file/10c0c9f5-fa58-2869-4fd9-af67fec26387/1/2012\\_Florida\\_Student\\_Textbook\\_Survey.pdf](https://florida.theorange grove.org/og/file/10c0c9f5-fa58-2869-4fd9-af67fec26387/1/2012_Florida_Student_Textbook_Survey.pdf)
- Franzen, R. H., & Knight, F. B. (1922). *Textbook Selection*. York, PA: Warwick & York, Inc.
- Hilton III, J. L. (2016). Open educational resources and college textbook choices: a review of research on efficacy and perceptions. *Education Technology Research and Development*, 64(4), 573–590. <https://doi.org/10.1007/s11423-016-9434-9>
- Hilton III, J. L., & Wiley, D. (2011). Open access textbooks and financial sustainability: A case study on Flat World Knowledge. *The International Review of Research in Open and Distributed Learning*, 12(5), 18–26. <http://dx.doi.org/10.19173/irrodl.v12i5.960>
- Kingkade, T. (2011, November 8). Rising costs force students to skimp on textbooks. *Huffington Post*. [http://www.huffingtonpost.com/2011/08/11/studentadvocates-sound-alarm-on-textbooks\\_n\\_924536.html](http://www.huffingtonpost.com/2011/08/11/studentadvocates-sound-alarm-on-textbooks_n_924536.html)
- Lee, D., van der Klaauw, W., Haughwout, A., Brown, M., & Scally, J. (2014). *Staff Reports: Federal Reserve Bank of New York, Number 668*, JEL classification: D12, D14, I22. Retrieved from [https://www.newyorkfed.org/research/staff\\_reports/sr668.html](https://www.newyorkfed.org/research/staff_reports/sr668.html)
- Littlejohn, A. (1996). The analysis of language teaching materials: Inside the Trojan Horse. In B. Tomlinson (Ed.). *Materials development in language teaching* (pp. 191–213). Cambridge: Cambridge University Press.
- Oakes, J. & Saunders, M. (2002). *Access to Textbooks, Instructional Materials, Equipment, and Technology: Inadequacy and Inequality in California's Public Schools*. UCLA: UCLA's Institute for Democracy, Education, and Access. Retrieved from <http://escholarship.org/uc/item/4ht4z71v>
- Ortony, A., Clore, G. L., & Collins, A. (1990). *The cognitive structure of emotions*. Cambridge university press.
- Pell Institute, The (2015). *Indicators of Higher Education Equity in the United States*. Retrieved from: [http://www.pellinstitute.org/downloads/publications-Indicators\\_of\\_Higher\\_Education\\_Equity\\_in\\_the\\_US\\_45\\_Year\\_Trend\\_Report.pdf](http://www.pellinstitute.org/downloads/publications-Indicators_of_Higher_Education_Equity_in_the_US_45_Year_Trend_Report.pdf)
- Selnack, E. (2014). *Fixing the Broken Textbook Market: How Students Respond to High Textbook Costs*. Center for Public Interest, Inc. Retrieved from <http://www.uspirg.org/sites/pirg/files/reports/NATIONAL%20Fixing%20Broken%20Textbooks%20Report1.pdf>
- Sheldon, L. (1988). Evaluating ELT textbooks and materials. *ELT Journal*, 42(4), 237–246.
- Skierso, A. (1991). Textbook selection and evaluation. In M. Celce Murcia (Ed.). *Teaching English as a second or foreign language* (pp. 432–453). Boston: Heinle and Heinle.
- Tucker, C. A. (1975). Evaluating beginning textbooks. *English Teaching Forum*, 13, 355–361.
- Ur, P. (1996). *A course in language teaching: Practice & Theory* (pp. 184–187). Cambridge: Cambridge University Press.
- Whitehouse (2016). “College Scorecard.” Retrieved in May 11, 2016 from <https://www.whitehouse.gov/issues/education/higher-education/college-score-card>
- Wiley, D. (2014, March 5). The Access Compromise and the 5th R. *Iterating toward openness*. Retrieved from <http://opencontent.org/blog/archives/3221>
- Williams, D. (1983). Developing Criteria for Textbook Evaluation. *ELT Journal*, 37(3).

## Appendix A

A copy of the **student instrument** is included here:

- Q1 - Clicking the button below indicates that you have read and understood the above consent and desire of your own free will to participate in this study.
- Q2 - What college/university are you attending?
- Q3 - Approximately how much money do you spend per class on textbooks?
- Q4 - How do you pay for textbooks?
- Q5 - Have you ever not purchased a textbook for a class because of the cost of the textbook?
- Q6 - Do you think that not purchasing the textbook influenced your grade in the course in a negative way?
- Q7 - Has not purchasing a textbook contributed to your decision to drop a course?
- Q8 - Has not purchasing a textbook ever caused you to fail or withdraw from a course?
- Q9 - Have you ever delayed purchasing a textbook for a class because of the cost of the textbook?
- Q10 - Do you think that delaying purchasing the textbook influenced your grade in a negative way?
- Q11 - Have you ever registered for fewer courses because of textbooks costs?
- Q12 - Have you ever not registered for a specific section of a course because of textbook costs?
- Q13 - If you didn't have to pay for textbooks, how would you use the money you saved?
- Q14 - What additional thoughts would you like to share regarding textbook costs?

A copy of the **faculty survey** is included here:

- Q1 - What is your academic appointment/rank?
- Q2 - What is your age?
- Q3 - What courses do you typically teach? (e.g. introductory physics)
- Q4 - Do you require students to purchase a textbook or other commercially published resources for use in your classes?
- Q5 - In the course(s) where you do not require students to purchase textbooks or other commercially published materials, what do you use in place of these resources?
- Q6 - How much do the substitute materials cost?
- Q7 - How did you find the substitute materials?
- Q8 - How do you choose textbooks for lower-division courses? (catalogue numbers 100–200 or 1000–2000)
- Q9 - Do you know the list price of the textbook or other commercially published resources you require your students to purchase?
- Q10 - Approximately how much do they cost?
- Q11 - How do you choose textbooks for upper-division undergraduate courses? (catalogue numbers 300–400 or 3000–4000—not graduate courses)
- Q12 - Removed
- Q13 - The following questions ask you about “open textbooks.” By “open textbooks” we mean digital textbooks that are (1) free of charge and (2) provide faculty with permission to make a wide range of changes, customizations, and improvements. Are you aware of any open textbooks that could be used to replace traditional textbooks or other commercially published resources in your course?
- Q14 - If a suitable open textbook could be identified for the course you teach, would you be willing to use it?

Q15 - Why would you be willing to use an open textbook?


Q16 - Why would you not be willing to use an open textbook?

Q17 - Would you like assistance in identifying a suitable open textbook?

Q18 - Please provide your name and email address so that a campus librarian can assist you in identifying a suitable open textbook for your course(s).



## Measures of student success with textbook transformations: the Affordable Learning Georgia Initiative

Emily Croteau   
University of Kentucky (USA)  
[emily.croteau@uky.edu](mailto:emily.croteau@uky.edu)

### Abstract

In 2014, the state of Georgia's budget supported a University System of Georgia (USG) initiative: Affordable Learning Georgia (ALG). The initiative was implemented via Textbook Transformation Grants, which provided grants to USG faculty, libraries and librarians, and institutions to "transform their use of textbooks and other learning materials into using lower cost options", in other words to use open educational resources (OER) in lieu of a traditional bound textbook. The Round One Textbook Transformation Grants have already shown to be successful in that they saved students approximately \$760,000. What is not known, is the collective impact on student learning. This study examines the learning gains or losses pre- and post-transformation in ALG Round One courses where traditional resources were replaced with OER. It estimates differences between pre- and post- textbook transformation across the following outcomes: 1) Drop Fail Withdraw (DFW) rates, 2) rates of completion, 3) numbers of students receiving a final grade of A or B, C and D, 4) numerical final grades as a percent, 5) final exam grades as a percent, and, 6) course-specific assessment grades measured in percent. Twenty-four data sets were analyzed for DFW rate, eight data sets for completion rate, fourteen data sets for grade distribution, three data sets for final exam grades, three data sets for course specific assessment and one data set for final grades. The null hypothesis that there would be no differences between pre- and post-transformation rates in these learning outcomes was supported. Thus, this study demonstrates that the USG's ALG initiative helped students save money without negatively impacting learning outcomes. In addition, it is the first of its kind to measure some of these learning outcomes (e.g. final exam grade, assessment grade, and distribution of letter grades) at this scale.

**Keywords:** Open Educational Resources; Affordable Learning Georgia; textbook transformation; learning outcomes; higher education

### Introduction

Successful teaching involves many components such as the knowledge and capabilities of both teachers and students, as well as curriculum materials and other available resources (Charalambous & Hill, 2012). One of the key pieces of curriculum materials in post-secondary education is the textbook (Altbach, Kelly, Petrie & Weis, 1991). Textbooks synthesize information on a particular subject, making them an invaluable reference for any curriculum. Although textbooks are valuable learning resources, their costs have risen dramatically, in some instances making them cost-prohibitive for many students. Hilton, Robinson, Wiley and Ackerman (2014) found that the average textbook price across seven colleges and multiple general education classes was \$90.00. Furthermore, during the 2015–2016 academic year, textbook and supplies costs for a college student ranged from \$1,249–\$1,364 (College Board, 2016). In addition, research done by the National Association for College Stores (NACS) show that average "new" textbook prices have increased steadily since the 2009–2010 academic year from \$62 to \$82 (NACS, 2016).

The perceived high cost of textbooks combined with other costs of higher education may negatively impact students from lower socioeconomic backgrounds (Paulsen & St. John, 2002). For example, those with lower incomes are more prone to delay college enrollment than their wealthier peers

(Provasnik & Planty, 2008). High costs, which include textbook costs, can also result in students taking fewer classes, delaying graduation (Buczynski, 2007). Moreover, many students do not purchase textbooks, which weakens their learning opportunities. One survey suggested that 23% of students regularly forego purchasing required textbooks due to their high cost (Florida Virtual Campus, 2012). One method to circumvent the high cost of textbooks is to replace commercial textbooks with Open Educational Resources (OER).

The following definition of OER was offered by Saul Fisher from the Andrew W. Mellon Foundation in 2002 at the Forum on the Impact of Open Courseware for Higher Education in Developing Countries convened by UNESCO: “The open provision of educational resources, enabled by information and communication technologies, for consultation, use and adaptation by a community of users for non-commercial purposes” (UNESCO, 2002, p. 24). According to the William and Flora Hewlett Foundation, OER can include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge (Hewlett, 2013). OER eschews traditional copyright in lieu of licenses that allow others to retain, reuse, revise, remix, and redistribute the materials (Hilton, Wiley, Stein & Johnson, 2010; Wiley, Bliss & McEwen, 2014).

By far the simplest way to implement OER in a college course is to replace the traditional textbook with an “open” textbook. There are scores of high-quality open textbooks available for students and faculty to freely use (Open Textbook Library, 2016; OpenStax, 2016) many of which go through professional peer review and publishing processes. Furthermore, many open textbooks are available in print in addition to being online. Many students prefer to purchase a printed copy regardless of whether the online version is free (Hilton & Wiley 2011). Printed versions of open textbooks cost substantially less than traditional textbooks.

The biggest concerns that faculty have concerning the adoption of OER are: 1. Whether the open resource is of similar quality to the traditional resource and, 2. How students will perform utilizing open resources (Allen & Seaman, 2014). To address the first concern, Bliss, Hilton, Wiley and Thanos (2013) surveyed the experiences of fifty-eight teachers and 490 students across eight colleges in their utilization of open texts. Bliss et al. (2013) found that approximately 50% of students said that the OER textbooks were of the same quality as traditional textbooks and nearly 40% said that they were better. Additionally, 55% of teachers adopting OER reported that the open materials were of the same quality as the materials they had previously used, and 35% felt that they were better. A recent study by Allen & Seaman (2014) found that of 2,144 surveyed college professors, 34% were aware of OER and of that 34%, 61.5% indicated OER had about the same “trusted quality” as traditional resources, 26.3% said that traditional resources were superior, and 12.1% said that OER were superior. Similarly, 68.2% said that the “proven efficacy” was about the same, 16.5% said that OER had superior efficacy and 15.3% said that traditional resources had superior efficacy. Hilton (2016) examined an additional eight studies of perceptions of OER in higher education and found similar results, namely that a strong majority of teachers who had adopted OER felt that they were as good or better than commercial resources. Based on these studies, on average OER appears to be of similar quality to traditional texts.

To address how students will perform utilizing open resources several studies have examined how using OER influences student performance measures. Lovett, Meyer and Thille (2008) measured the efficacy of an OER statistics module in comparison with the traditional educational model at Carnegie Mellon University during fall 2005 and spring 2006 semesters. Their results showed no significant difference between test scores (three midterms and one final exam) of students utilizing OER vs. the students in the traditional class. Bowen, Chingos, Lack and Nygren (2014) also compared the use of a traditional textbook in a face-to-face lecture class with that of a blended

approach utilizing OER at Carnegie Mellon's open statistics module. Bowen and colleagues found that, while students who utilized OER scored slightly higher than their peers on standardized exams, the difference was not statistically significant. Allen, Guzman-Alvarez, Molinaro and Larsen (2015) studied 478 students that used ChemWiki, an OER, for its primary textbook, and 448 students who utilized a commercial textbook. Pre-tests, combined with final exams showed no significant differences in individual learning gains between the two groups. These studies show that utilizing OER not only results in cost-savings but do not sacrifice student learning outcomes.

A few studies have shown that student learning increased in OER classes in comparison to a course that used traditional resources. First, Pawlyshyn, Braddlee, Casper and Miller (2013) found that when OER material was integrated into the math courses at Mercy College, student learning significantly increased. The pass rates of math courses increased from 63.6% in fall 2011 (when traditional learning materials were employed) to 68.9% in fall 2012 when all courses were taught with OER. Similarly, students who were enrolled in OER versions of a reading course performed better than their peers who enrolled in the same course using non-OER materials. Second, Hilton & Laman (2012) compared the performance of 690 students using an open textbook in an introductory psychology class to the performance of 370 students who used a traditional textbook in a previous semester. They concluded that students who used the open textbook achieved better grades, had a lower withdrawal rate, and scored better on the final examination. Lastly, Feldstein et al. (2012) found that students in courses using open textbooks typically had higher grades and lower failure and withdrawal rates than those in courses with traditional textbooks. However, it is important to note that the authors pointed out significant limitations in the two latter studies and stressed that these results were not generalizable. Given this, there isn't enough information to universally say that OER will unequivocally increase student learning gains.

In contrast, in one instance, OER were found to be associated with lower outcomes. Robinson (2015) examined OER adoption at seven different institutions of higher education. In the 2012–2013 academic year, 3,254 students across the seven institutions enrolled in experimental versions of eight different courses that utilized OER and 10,819 enrolled in the equivalent versions of the course that utilized traditional textbooks. Robinson (2015) found that there were no statistically significant differences between the two groups in terms of final grades or completion rates in five of the eight classes. However, students in two courses performed significantly worse, receiving one-half to a full grade lower than their peers. Students in one class were significantly more likely to complete the course, although there were no statistically significant differences between groups in the overall course grades. Across all classes there was a small but statistically significant difference between the two groups in terms of the number of credits they took, with students enrolled in OER versions of the course taking on average .25 credits more than their counterparts in the control group. This study demonstrates the confounding factors that need to be taken into account when specific measures of performance are analyzed.

Hilton (2016) synthesized the above studies, as well as some additional ones and found that when students use OER in their classes, student outcomes are the same or better than when a traditional textbook is used. While these results are collectively interesting, they are far from comprehensive. Given the paucity of studies that have measured student performance using OER, much more research needs to be done to determine what relationship (if any) exists between the use of OER and student performance in higher education. In addition, performance measures like distribution of letter grades or performance on course specific assessments are an important part of general course assessment. These types of data are specifically lacking in the OER literature and should be included in evaluations of OER efficacy. The purpose of the present study is to add to the body of literature by examining the effectiveness of several OER adoptions that occurred in connection



with Affordable Learning Georgia. As described in further detail below, I examined the results of 4950 students across 36 classes in 18 universities. My specific research question was as follows: is using OER associated with a change in student learning outcomes?

### **Context of the Present Study**

In 2014, the state of Georgia decided to include funding in the state budget to support a University System of Georgia (USG) initiative: Affordable Learning Georgia (ALG). ALG's focus was on reducing costs of textbooks and enhancing GALILEO (GeorgiA Library LEarning Online), and Georgia's Virtual Library. The initiative was implemented via Textbook Transformation Grants, which provided grants to USG faculty, libraries and librarians, and institutions to "transform their use of textbooks and other learning materials into using lower cost options" (Affordable Learning Georgia, 2016). ALG's Textbook Transformation Grants program has a three-fold objective: 1. Pilot different approaches in USG courses for textbook transformation including adoption, adaptation, and creation of Open Educational Resources (OER) and/or identification and adoption of materials already available in GALILEO and USG libraries, 2. Provide support to faculty, libraries, and their institutions to implement these approaches, and, 3. Lower the cost of college for students and contribute to their retention, progression, and graduation.

Two levels of funding are available for award. The Standard-Scale Transformation includes transformation of one or more courses with less than 500 students enrolled on average per academic year, funding a maximum of \$10,800. The Large-Scale Transformation involves one or more courses/sections or department-wide adoptions involving 500 or more students enrolled on average per academic year and funds a maximum of \$30,000. Proposals can be submitted to one of four categories: No-or-Low-Cost-to Students Learning Materials, OpenStax Textbooks, Interactive Course-Authoring Tools and Software approach, (replaced the Course Pack Pilots category available in Rounds 1 and 2) and, the Top 100 Undergraduate Courses. Proposals to be submitted for funding through the Textbook Transformation Grants need to follow certain guidelines and certain activities are required to receive full funding (see <https://affordablelearninggeorgia.org> for more information on proposal submission and information about submission categories). To date, there have been eight calls for proposals for textbook transformation, with the latest call addressing courses for FA 2017.

The Round One Textbook Transformation Grants have already shown to be successful in that they saved students approximately \$760,000 (Affordable Learning Georgia, 2015). What is not known, however, is the collective impact on student learning. Yes, students saved \$760,000—but did they obtain positive learning outcomes? In the present study I will examine the learning gains or losses pre- and post-transformation in ALG Round One Grantees.

### **Methods**

ALG's Round One call for proposals for Textbook Transformation Grants yielded the funding of 29 proposals encompassing 36 courses set to take place during the Spring 2015 academic semester. The types of data that were reported across projects varied. For example, some reported qualitative data and some reported quantitative data or both were reported. Quantitative data reporting consisted of 1) Drop Fail Withdraw (DFW) rates, 2) rates of completion, 3) numbers of students receiving a final grade of A or B, C and D, 4) numerical final grades as a percent, 5) final exam grades as a percent, and, 6) course-specific assessment grades measured in percent. These measures were not consistently reported across all groups. Some groups provided pre-transformation values for these measures. Not all groups reported qualitative data, but those that did, collected those data via surveys, focus groups or student quotes. Survey questions were not consistent across groups.

In terms of quantitative data, one project did not report any quantitative data and seven projects did not make comparisons to pre-transformation data, leaving 21 projects and 27 courses viable for pre/post-transformation data analysis (Table 1). In each of the 21 projects, a faculty member (or members) created or utilized pre-existing OER to substitute for the traditional resources they used in previous semesters. For example, faculty members replaced the traditional bound textbook with a complete open source book (online textbook or ebook) or with individual subject-specific open-source documents or used subject specific websites. The goal of the transformation grants was to replace the costly resources used with a free version(s) and not to transform content or learning activities. Each faculty member taught both the pre- and post-transformation course and supplied the data for comparison. The information gathered provided paired data sets for analysis without instructor bias within each set.

In terms of qualitative data reported, all projects reported three quotes from their students for their respective projects. Twenty of the 29 projects provided results from surveys administered for their project. Survey questions varied, but those of interest for the present study included, whether students thought the quality of the text was comparable to a traditional textbook and whether they thought their learning experiences were enhanced.

**Table 1: Courses, Universities/Colleges and Number of Students affected in ALG's Round 1 Textbook Transformation Grants**

Course Title	University/College	Number of Students enrolled
Calculus I, Calculus II, Calculus III (MATH 1161, MATH 2072, MATH 2083)	Armstrong State University	300
Principles of Biology (BIO 1215K)	Columbus State University	188
Anatomy and Physiology I & II (BIO 2212, BIO 2213)	Dalton State College	71
General Psychology (PSYC 1101)	East Georgia State College	204
Legal Environment of Business (LENB 3135)	Georgia and State University College	124
College Algebra (MATH 1111)	Georgia and State University College	159
Human Factors in Design (ID 2320)	Georgia Institute of Technology	68
Introduction to Computing (CSCI 1100)	Georgia Perimeter College	925
Introduction to Psychology (PSYC 1101)	Georgia Southwestern State University	34
Issues in African and African Diaspora Studies (AADS 1102)	Kennesaw State University	37
Principles of Chemistry I (CHEM 1211)	Kennesaw State University	70
Introduction to Web Development (IT5302)	Kennesaw State University	62
Calculus II (MATH 2254)	Kennesaw State University	70
Nursing Research for Evidence Based Practice (NURS 4402)	Kennesaw State University	56

Course Title	University/College	Number of Students enrolled
American Government (POLS 1101)	Middle Georgia State College	210
Introduction to Biology II (BIO 1020K)	South Georgia State College	34
Evolution and Biodiversity, Organismal Biology (BIOL 1010, BIOL 1030)	Valdosta State University	959
Mathematics and Technology in Early Childhood Education (ECED 3300)	Valdosta State University	43
Principles of Logic and Argumentation (PHIL 2020)	Valdosta State University	39
Exploring Socio-Cultural Perspectives on Diversity (EDUC 2120)	University of Georgia	99
Introduction to Algebra, Intermediate Algebra, College Algebra (MATH 0097, MATH 0099, MATH 1111)	University of North Georgia	95
27 Courses	14 Institutions	3847 Students

## Data Analysis

I estimated differences between pre- and post- textbook transformation across the following outcomes: 1) DFW rates, 2) rates of completion, 3) numbers of students receiving a final grade of A or B, C, and D, 4) numerical final grades as a percent, 5) final exam grades as a percent, and, 6) course-specific assessment grades measured in percent. Since the data accumulated from this study comes from different populations of students, it is necessary to check whether each data set conforms to a normal distribution (or not) to direct subsequent statistical analyses. Additionally, it is possible that variance across projects is not homogeneous (Glass, 1966). Equality of variances should be assured prior to performing statistical tests. A Levene test (Levene, 1960; Brown & Forsythe, 1974) was used to check for equality of variances. A Shapiro-Wilk test was used to check for data normality (Shapiro & Wilk, 1965). This test was chosen over other tests of normality because it works best with smaller sample sizes and has shown to be more powerful than other similar statistical tests (Razali & Wah, 2011). If the Shapiro-Wilk test shows that the data are normally distributed, parametric statistics can be performed and if the data is not normally distributed non-parametric statistics are performed. Since the data is paired (i.e. pre- and post- data), a paired t-test (data normally distributed) or a Wilcoxon signed-rank test (data not normally distributed; Wilcoxon, Katti and Wilcox (1970) will be used to test the null hypothesis that there is no difference between pre- and post-transformation student learning outcomes. Lastly, the Bonferroni correction was applied to the paired tests to adjust for multiple comparisons and control for Type I errors.

## Results

I measured results based on the data that was provided by the individual reports. Sixteen projects reported information on DFW rates, seven projects reported completion rate data, seven projects reported grade distribution data, three projects reported final exam grades, three projects reported

course specific assessment data and one project reported final grade data. In sum, there are twenty-four data sets for DFW rate, eight data sets for completion rate, fourteen data sets for grade distribution, three data sets reported for final exam grades, three data sets reported for course specific assessment and one data set reported for final grades. The Shapiro Wilk test indicated that most of the data was normally distributed ( $\alpha = 0.05$ ), although the paired data for completion rate and distribution of D grades was not at that same alpha level (Table 10). That being said, the Levene's test indicated that there was equality of variance across all the data ( $\alpha = 0.05$ ; Table 10). As a result, a paired t-test was performed for all analyses except for completion rate and distribution of D grades, in which a Wilcoxon signed rank test was performed. All analyses, parametric and non-parametric alike, was not significant after Bonferroni correction ( $\alpha = 0.008$ ; Table 10). Hence, the null hypothesis that there was no difference pre- and post- transformation was supported.

Pre- and post-transformation data sets compiled for DFW rate resulted in the analysis of 24 courses/sections of courses (Table 2). Twenty-four data sets were included affecting 3133 students. DFW rate was provided for paired courses/sections of courses. Inspection of the data showed some individual variation from course to course. For example, some courses showed changes in DFW rate in favor of pre-transformation (N=11) and others showed changes in favor of post-transformation (N=12). In one case, there was no change (N=1). A Shapiro Wilk test indicated that the data was normally distributed and a Levene's test indicated that there was equality of variance across the data ( $\alpha = 0.05$ ; Table 10). A paired t-test showed that the results were not statistically significant ( $\alpha = 0.008$ ; Table 10). Hence, the null hypothesis that there was no difference pre- and post-transformation was supported.

**Table 2: Drop Fail Withdraw (DFW) Rate Pre- and Post- OER Transformation for 10 Georgia Colleges and Universities**

College/University	Number of Students	DFW Rate Pre-Transformation (Percent) per section	DFW Rate Post-Transformation (Percent) per section	Favors Pre- or Post – OER.
Columbus State University	188	6.59	14.89	Pre
Dalton State College	71	35 42	8 37	Post Post
Georgia College and State University College	159	17.4	21.7	Pre
Georgia College and State University College	124	1	9	Pre
Georgia Perimeter College	925	4	2	Post
Georgia Southwestern State University	34	9	8	Post
Kennesaw State University	56	0	0	Neither
Kennesaw State University	37	17	36	Pre
Kennesaw State University	70	25.5 49	34.3 45.7	Pre Post
Kennesaw State University	62	14.2	11.1	Post
Kennesaw State University	70	41.67	55.7	Pre

College/University	Number of Students	DFW Rate Pre-Transformation (Percent) per section	DFW Rate Post-Transformation (Percent) per section	Favors Pre- or Post – OER.
Middle Georgia State College	210	38 32 9 18 18 17	27 19 18 24 13 16	Post Post Pre Pre Post Post
South Georgia State College	34	4	9	Pre
University of North Georgia	95	31.2 32.3	48.3 66.2	Pre Pre
Valdosta State University	39	28.3	11.2	Post
Valdosta State University	959	32.97	29.25	Post

Pre- and post-transformation data sets compiled for completion rate resulted in the analysis of eight courses/sections of courses (Table 3). Eight data sets were included affecting 329 students. Completion rate was provided for paired courses/sections of courses. These data also showed some individual variation from course to course. Two courses showed changes in completion rate in favor of pre-transformation and four courses showed changes in favor of post-transformation. In two cases, there was no change. A Shapiro Wilk test indicated that the data was not normally distributed ( $\alpha = 0.05$ ; Table 10) but a Levene's test indicated that there was equality of variance across the data ( $\alpha = 0.05$ ; Table 10), so a Wilcoxon signed rank test was performed and was found to be not significant ( $\alpha = 0.008$ ; Table 10). Hence, the null hypothesis that there was no difference pre- and post- transformation was supported.

**Table 3: Completion Rate Pre- and Post- OER Transformation for four Georgia Colleges and Universities**

College/University	Number of Students	Completion Rate Pre-Transformation (Percent) per section	Completion Rate Post-Transformation (Percent) per section	Support of Pre- or Post-?
Georgia Southwestern State University	34	94	97	Post
Kennesaw State University	56	100	100	Neither
Kennesaw State University	62	85.8	88.9	Post
University of Georgia	99	88.03	98	Post
University of North Georgia	95	68.8 67.7	51.7 41.2	Pre Pre
Valdosta State University	39	71.7	88.8	Post
Valdosta State University	43	100	100	Neither

Pre- and post-transformation data sets compiled for grade distribution rate resulted in the analysis of 14 courses/sections for A/B grades (Table 4, affecting 828 students), 12 courses/sections for C grades (Table 5, affecting 733 students), and eight courses/sections for D grades (Table 6, affecting 403 students). Grade distribution data was provided for paired courses/sections of course in each table. Variation from course to course was evident. For A/B grades, six courses showed changes in favor of pre-transformation, seven courses showed changes in favor of post-transformation and there was no change in two courses. For C grades, seven courses showed changes in favor of pre-transformation, four courses showed changes in favor of post-transformation and there was no change in one course. For D grades, three courses showed changes in favor of pre-transformation, three courses showed changes in favor of post-transformation and there was no change in two courses. Separate Shapiro Wilk tests implemented for A/Bs, Cs and Ds indicated that the paired data for A/Bs and Cs was normally distributed but that the paired data for Ds was not ( $\alpha = 0.05$ ; Table 10). However, separate Levene's tests for numbers of A/Bs, Cs and Ds all indicated that there was equality of variance across the data ( $\alpha = 0.05$ ; Table 10). As a result, paired t-tests were performed for A/Bs and Cs and a Wilcoxon signed rank test was performed for Ds. All tests were found to be not significant ( $\alpha = 0.008$ ; Table 10). Hence, the null hypothesis that there was no difference pre- and post- transformation was supported.

**Table 4: Distribution of A&Bs Pre- and Post- OER Transformation for six Georgia Colleges and Universities**

College/University	Number of Students	A & B Pre-Transformation (percent)	A & B Post-Transformation (percent)	Support of Pre- or Post-?
East Georgia State College	204	51	69	Post
Georgia and State University College	159	64.9	71.1	Post
Kennesaw State University	56	100	96	Pre
Kennesaw State University	70	14 19	12 16	Pre Pre
Middle Georgia State College	210	38 35 65 38 36 34	50 39 68 59 25 34	Post Post Post Post Pre Neither
South Georgia State College	34	83	73	Pre
University of North Georgia	95	40.9 22.6	37.9 27.5	Pre Post

**Table 5: Distribution of Cs Pre- and Post- OER Transformation for five Georgia Colleges and Universities**

College/University	Number of Students	C Pre-Transformation (percent)	C Post-Transformation (percent)	Support of Pre- or Post-?
East Georgia State College	204	34	20	Pre
Georgia and State University College	159	17.7	13.2	Pre
Kennesaw State University	56	0	4	Post
Kennesaw State University	70	6 7	5 7	Pre Neither
Middle Georgia State College	210	25 32 21 35 24 20	20 16 12 15 25 34	Pre Pre Pre Pre Post Post
South Georgia State College	34	13	18	Post

**Table 6: Distribution of Ds Pre- and Post- OER Transformation for three Georgia Colleges and Universities**

College/University	Number of Students	D Pre-Transformation (percent)	D Post-Transformation (percent)	Support of Pre- or Post-?
Georgia and State University College	159	5.7	5.7	Neither
Middle Georgia State College	210	3 0 6 9 21 29	3 26 3 3 38 16	Neither Post Pre Pre Post Pre
South Georgia State College	34	0	6	Post

Pre- and post-transformation data sets compiled for final exam grade rate (Table 7, affecting 186 students) and assessment grade (Table 8, affecting 328 students) resulted in the analysis of three courses for each. All courses showed changes in favor of pre-transformation (Tables 7 and 8). A Shapiro Wilk test indicated that the data was normally distributed and a Levene’s test indicated that there was equality of variance across the data ( $\alpha = 0.05$ ; Table 10). Although the raw scores were higher pre-transformation, these results were not statistically significant ( $\alpha = 0.008$ ; Table 10). Hence, the null hypothesis that there was no difference pre- and post- transformation was supported.

**Table 7: Final Exam Grades Pre- and Post- OER Transformation for two Georgia Universities**

College/University	Number of Students	Final Exam Grade Pre-Transformation (Percent) per section	Final Exam Grade Post-Transformation (Percent) per section	Support of Pre- or Post-?
Georgia Institute of Technology	68	84	78	Pre
Kennesaw State University	56	95.37	92.78	Pre
Kennesaw State University	62	89	77	Pre

**Table 8: Assessment Grades Pre- and Post- OER Transformation for two Georgia Universities**

College/University	Number of Students	Assessment Grade Pre-Transformation (Percent) per section	Assessment Grade Post-Transformation (Percent) per section	Support of Pre- or Post-?
Columbus State University	188	64	58	Pre
Kennesaw State University	70	78	68	Pre
Kennesaw State University	70	74	64	Pre

Data analysis was not performed within the final grade data category since only one paired course data set was provided (Table 9). However, in the sample of 68 students, final grades pre-transformation was favored.

**Table 9: Final Grades Pre- and Post- OER Transformation for one Georgia University**

College/University	Number of Students	Final Grade Pre-Transformation (Percent) per section	Final Grade Post-Transformation (Percent) per section	Support of Pre- or Post-?
Georgia Institute of Technology	68	91	89	Pre

The Shapiro Wilk Test and Levene Test was tested at  $\alpha = 0.05$  and the Paired T-Test and Wilcoxon Signed Rank Test was tested at  $\alpha = 0.008$  (Table 10).

**Table 10: Descriptive statistics for each set of data used in the analysis**

Data Set	Sample size (N) N = # of paired data sets	Shapiro Wilk Test p – value	Levene Test p – value	Paired T-Test or Wilcoxon Signed Rank Test p – value
DFW rate	24	0.054	0.25	0.51
Completion rate	8	0.008	0.39	1
Number of A's & B's	14	0.142	0.36	2.16
Number of C's	10	0.436	1.1	2.20
Number of D's	8	0.005	0.14	0.528
Final exam grade	3	0.52	0.082	4.30
Course specific assessment	3	0.819	0.68	4.30



The qualitative data that was provided varied. Quotes provided by students were generally uninformative with regards to their perception of the quality of the text. The vast majority of comments were about textbook cost (or lack thereof). Responses to survey data were more informative; however, since questions were different for each project, standardizing responses is impossible. That being said general insight can be gleaned from these data. Of the 20 projects that provided survey data, 16 (80%) were on average positive or neutral with regards to OER quality and perceived learning, three provided an overall negative perception of OER (15%), and one was uninformative with regards to OER quality and enhancement of learning (5%). The three projects that had negative OER survey data related to specific chapters of the OER rating lower or the entire book rating lower in terms of quality in comparison to the traditional textbook. In these surveys quality in general was perceived as organization, helpfulness with coursework or visual appeal.

## Discussion

The null hypothesis that there would be no differences between pre- and post-transformation rates of DFW, rates of completion, distribution of letter grades, final exam grades and course specific assessment grades was supported ( $p$  values ranged from 0.51–4.30). Thus, this study demonstrates that the USG's ALG initiative helped students save money without negatively impacting learning outcomes. Non-significant results are important to report (Polanin, Tanner-Smith & Hennessy, 2016) and in this case supports the utility of OER because they indicate that students did as well using an open resource as they did using a traditional resource. Furthermore, Polanin et al. (2016) suggested that not reporting non-significant results can create dissemination biases that can affect which programs or policies are continued that may or may not be effective. Additionally, the purporting of these biases may inhibit the growth of new research.

This study is the first of its kind to measure some of these learning outcomes (e.g. final exam grade, assessment grade, and distribution of letter grades) at this scale. Fischer, Hilton, Robinson and Wiley (2015) focused on course completion, final grade, and enrollment intensity measures in a multi-institution study but indicated that more replicative studies were necessary and suggested that questions pertaining to the grades individual students receive when using OER vs. traditional resources would be of value.

The overall results are not statistically significant even though some measures of student learning outcomes show small gains or decreases in student learning when OER are adopted. These results suggest a consistent level of student performance pre- and post-transformation and underscores the quality of each chosen OER. The survey data that was provided generally supports the notion that students did not perceive a difference in quality or understandability when using the OER and the demonstration that students performed equally as well with the OER supports perceived high quality.

This study indicates that the individual project investigators chose appropriate OER to substitute for the traditional text(s) and aligned their course objectives with them well. The differences between pre- and post-transformation may have been more widespread with different overall results had the OER not been chosen and developed carefully. While the overall results are not statistically significant, there were individual instances in which students did better (or worse) when OER were implemented. Future studies should examine more carefully what factors coincide with higher or lower efficacy results. For example, it is possible that the change in resources resulted in instructor anxiety, lack of confidence or disorganization relating to the alignment of teaching materials with the new resources. Furthermore, it is possible that the overall impact of curriculum materials is relatively low and that the overall influence is small because it reflects this fact.

Moreover, further studies should examine whether there are connections between students' utilization of curriculum materials and their overall scores. While explicit quantitative data on student use was not gathered, I have implicitly assumed that had utilization decreased significantly, it would have had a significant negative impact on student measures. However, it is conceivable that curriculum materials matter less than we think, or that the relative use of materials would need to be dramatically different in order to significantly influence student outcomes.

## Limitations

Selecting projects that performed pre/post-transformation analysis and further selecting for specific measures whittled down the sample size for each data point, even though the overall sample size is large. This was a result of an inconsistent rate of reporting of specific data measurements amongst researchers (i.e. some reported only DFW while another only reported assessment grades), lack of pre-transformation data reporting and limited reporting of informative data (perhaps researchers were not sure what to report). Far more data should be collected by future Textbook Transformation Grant awardees to clearly address whether students are succeeding with OER. Additionally, the data that are collected should be consistent throughout grants. For example, all grantees should collect the same types of data to form a more robust data set and this data collection should be explicitly requested by ALG in the information when the call for proposals is made and outlined in final reports. Additionally, identical surveys should be employed across grants to ensure consistency of qualitative data.

The overall non-significant differences between pre- and post-transformation may have come from the overall re-design of courses and not the OER on its own. In some cases, the OER may have necessitated a reexamination of the course, so it is possible that course objectives aligned better with the OER than the traditional text. In addition, a fresh look at course material may have clarified objectives or alignment issues that were previously undetected. However, both of these factors are positive occurrences in terms of teaching and education.

## Future Directions

To date, relatively little is known about the efficacy of OER. Additional large-scale studies are needed. With so many institutions now using OER there is an opportunity to conduct research on many aspects, including those that focus on differences in outcomes between traditional and OER taught courses. Furthermore, some individual courses are taught by multiple professors, which would lend to studying the learning outcomes based on pedagogical differences. Identifying differences in pedagogy may provide insight into the instructional design measures that may enhance OER learning outcomes.

The results of this study showed no difference in expected learning outcomes, which is satisfactory. However, most teachers are looking to improve student learning. It would be important to identify if there are certain types or platforms of delivery of OER that assist in learning or whether there are specific improvements that could be made to the OER to augment learning.

## Acknowledgements

I'd like to thank J. Gallant at ALG for providing the data for analyses. J. Hilton III deserves special recognition for providing comments on and direction of the manuscript. Thanks to L. Fischer and

C.L. Mott for help with statistical analyses. Additional thanks to R. Bodily and several anonymous reviews of previous versions of this manuscript. This work could not have been completed without the support of the OER research fellowship program provided by the open education group ([openedgroup.org](http://openedgroup.org)) and additional support provided in part by the William and Flora Hewlett Foundation. The Foundation did not see or influence this work prior to its publication.




## References

- Affordable Learning Georgia (2015). *Textbook Transformation Grants Round One: Spring Semester 2015 Final Report Summary*. Retrieved from: [http://affordablelearninggeorgia.org/documents/ALG\\_R1\\_Final\\_Report.pdf](http://affordablelearninggeorgia.org/documents/ALG_R1_Final_Report.pdf)
- Affordable Learning Georgia (2016). <https://affordablelearninggeorgia.org>
- Allen, G., Guzman-Alvarez, A., Molinaro, M., & Larsen, D. (2015). Assessing the Impact and Efficacy of the Open-Access ChemWiki Textbook Project. *Educause Learning Initiative Brief*. Retrieved from <https://library.educause.edu/resources/2015/1/assessing-the-impact-and-efficacy-of-the-openaccess-chemwiki-textbook-project>
- Allen, I. E., & Seaman, J. (2014). *Opening the Curriculum: Open Educational Resources in US Higher Education, 2014*. Babson Survey Research Group.
- Altbach, P. G., Kelly, G. P., Petrie, H. G., Weis, L. (Ed.). (1991). *Textbooks in American society: Politics, policy, and pedagogy*. New York: State University of New York Press.
- Bliss, T. J., Hilton III, J., Wiley, D., & Thanos, K. (2013). The cost and quality of online open textbooks: Perceptions of community college faculty and students. *First Monday*, 18(1). <https://doi.org/10.5210/fm.v18i1.3972>
- Bowen, W. G., Chingos, M. M., Lack, K. A., & Nygren, T. I. (2014). Interactive Learning Online at Public Universities: Evidence from a Six-Campus Randomized Trial. *Journal of Policy Analysis and Management*, 33(1), 94–111. <https://doi.org/10.18665/sr.22464>
- Brown, M. B. & Forsythe, A. B. (1974). Robust Tests for the Equality of Variances. *Journal of the American Statistical Association*, 69, 364–367.
- Buczynski, J. A. (2007). Faculty begin to replace textbooks with “freely” accessible online resources. *Internet Reference Services Quarterly*, 11(4), 169–179.
- Charalambous, C. Y. & Hill H. C. (2012). Teacher knowledge, curriculum materials, and quality of instruction: Unpacking a complex relationship. *Journal of Curriculum Studies*, 44(4), 443–466.
- College Board (2016). <https://collegeboard.org>
- Feldstein, A., Martin, M., Hudson, A., Warren, K., Hilton III, J., & Wiley, D. (2012). Open Textbooks and Increased Student Access and Outcomes. *European Journal of Open, Distance and E-Learning*. Retrieved from <http://www.eurodl.org/index.php?article=533>
- Fischer, L., Hilton III, J., Robinson, T. J. & Wiley, D. (2015). A multi-institutional study of the impact of open textbook adoption on the learning outcomes of post-secondary students. *Journal of Computing in Higher Education*, 27(3), 159–172. <https://doi.org/10.1007/s12528-015-9101-x>
- Florida Virtual Campus. (2012). *2012 Florida Student Textbook Survey*. Tallahassee, FL. Retrieved from [http://www.openaccesstextbooks.org/%5Cpdf%5C2012\\_Florida\\_Student\\_Textbook\\_Survey.pdf](http://www.openaccesstextbooks.org/%5Cpdf%5C2012_Florida_Student_Textbook_Survey.pdf).
- Glass, G. V. (1966). Testing homogeneity of variances. *American Educational Research Journal*, 3(3), 187–190.
- Hewlett (2013). *Open Educational Resources*. Retrieved from <http://www.hewlett.org/programs/education-program/open-educational-resources>

- Hilton III, J. L. (2016). Open educational resources and college textbook choices: a review of research on efficacy and perceptions. *Education Technology Research and Development*, 64(4), 573–590. <https://doi.org/10.1007/s11423-016-9434-9>
- Hilton III, J. L., & Laman, C. (2012). One college's use of an open psychology textbook. *Open Learning: The Journal of Open, Distance and e-Learning*, 27(3), 265–272. <http://dx.doi.org/10.1080/02680513.2012.716657>
- Hilton III, J. L., Robinson, T. J., Wiley, D., & Ackerman, J. D. (2014). Cost-savings achieved in two semesters through the adoption of open educational resources. *The International Review of Research in Open and Distributed Learning*, 15(2). <http://dx.doi.org/10.19173/irrodl.v15i2.1700>
- Hilton III, J. L., & Wiley, D. (2011). Open access textbooks and financial sustainability: A case study on Flat World Knowledge. *The International Review of Research in Open and Distributed Learning*, 12(5), 18–26. <http://dx.doi.org/10.19173/irrodl.v12i5.960>
- Hilton III, J. L., 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, Distance and E-Learning*, 25(1), 37–44. Retrieved from <http://www.tandfonline.com/doi/full/10.1080/02680510903482132>
- Levene, H. (1960). Robust tests for equality of variances. In *Contributions to probability and statistics* (pp. 278–292). Stanford University Press.
- Lovett, M., Meyer, O., & Thille, C. (2008). The open learning initiative: Measuring the effectiveness of the OLI statistics course in accelerating student learning. *Journal of Interactive Media in Education*, 2008(1), Art-13. <http://doi.org/10.5334/2008-14>
- National Association of College Stores (NACS) (2016). <https://nacs.org>
- OpenStax (2016). <https://openstax.org>
- Open Textbook Library (2016). <http://open.umn.edu/opentextbooks/>
- Paulsen, M. B., & St John, E. P. (2002). Social class and college costs: Examining the financial nexus between college choice and persistence. *The Journal of Higher Education*, 73(2), 189–236.
- Pawlyshyn, N., Braddlee, D., Casper, L., & Miller, H. (2013). Adopting OER: A Case Study of Cross-Institutional Collaboration and Innovation. Educause Review. Retrieved from <http://er.educause.edu/articles/2013/11/adopting-oer-a-case-study-of-crossinstitutional-collaboration-and-innovation>
- Polanin, J. R., Tanner-Smith, E. E. & Hennessy, E. A. (2016). Estimating the difference between published and unpublished effect sizes: A meta-review. *Review of Educational Research*, 86(1), 207–236. <https://doi.org/10.3102/0034654315582067>
- Provasnik, S., & Planty, M. (2008). *Community Colleges: Special Supplement to The Condition of Education 2008*. National Center for Education Statistics. Retrieved from <https://nces.ed.gov/pubs2008/2008033.pdf>
- Razali, N. M. & Wah, Y. B. (2011). Power comparisons of Shapiro-Wilk, Kolmogorov-Smirnov, Lilliefors and Anderson-Darling tests. *Journal of Statistical Modeling and Analytics*, 2, 21–33.
- Robinson, T. J. (2015). *The Effects of Open Educational Resource Adoption on Measures of Post-Secondary Student Success*. Unpublished Doctoral Dissertation, Brigham Young University, Provo, UT, USA.
- Shapiro, S. S., & Wilk, M. B. (1965). An analysis of variance test for normality (complete samples). *Biometrika*, 52, 591–611.
- UNESCO (2002). *Forum on the impact of open courseware for higher education in developing countries: Final report*. Retrieved from [www.unesco.org/iiep/eng/focus/opensrc/PDF/OERForumFinalReport.pdf](http://www.unesco.org/iiep/eng/focus/opensrc/PDF/OERForumFinalReport.pdf)

- Wilcoxon, F., Katti, S. K., & Wilcox, R. A. (1970). Critical values and probability levels for the Wilcoxon rank sum test and the Wilcoxon signed rank test. *Selected tables in mathematical statistics, 1*, 171–259.
- Wiley, D., Bliss, T. J., & McEwen, M. (2014). Open Educational Resources: a review of the literature. In *Handbook of research on educational communications and technology* (pp. 781–789). New York: Springer.

## Building a Virtual Learning Environment to Foster Blended Learning Experiences in an Institute of Application in Brazil

Andrea da Silva Marques Ribeiro , Esequiel Rodrigues Oliveira  & Rodrigo Fortes Mello   
*Universidade do Estado do Rio de Janeiro - State University of Rio de Janeiro (Brazil)*  
[andrea.ribeiro@uerj.br](mailto:andrea.ribeiro@uerj.br), [esequiel@uerj.br](mailto:esequiel@uerj.br) & [rodrigo.fomel@gmail.com](mailto:rodrigo.fomel@gmail.com)

### Abstract

Blended learning, the combination of face-to-face teaching with a virtual learning environment (VLE), is the theme of this study that aims at describing and analyzing the implementation of a VLE in the Institute of Application Fernando Rodrigues da Silveira, an academic unit of the State University of Rio de Janeiro. This study's main contribution is to reflect on the complexity of the institute that comprises schooling for basic education students and teacher education, from elementary school to postgraduate education. The wide scope of the institute encompasses face-to-face and non-presential activities, in different proportions, depending on the educational segment. Thus, starting from the assumption that blended learning teaching processes foment more student-centered educational models and facilitate interactions between individuals, a collaborative way was chosen as the VLE development method, contributing to pedagogical practices that favor meaningful learning. The VLE design was developed to meet the different needs and demands of the different educational segments. Currently there are 295 registered users. However, there are no registered basic education students so far. This can be justified by the fact that the VLE is relatively new to the community, and the participation of basic education students in the VLE depends on their teachers' enrolment and use of the VLE itself.

**Keywords:** blended learning; basic education; teacher education; design of virtual learning environment; cooperation school/university

### Introduction

The aim of this study is to describe and reflect on building and implementation of a virtual learning environment (VLE, henceforth) in different education segments, from basic education to postgraduate courses in the Institute of Application Fernando Rodrigues da Silveira, an academic unit of the University of the State of Rio de Janeiro in Brazil. The VLE was designed to complement the activities of face-to-face teaching and build blended learning teaching processes. Despite technological advancements and legislation, that regulate Distance Education (DE, henceforth) in Brazil, there is still prejudice and misinformation about its potentialities.

DE has been substantially growing. According to figures provided by the Ministry of Education and Culture (MEC), there were 49,911 students enrolled in distance higher education courses in 2003. However, in 2013, the number of enrolments rose to 1,153,572. The 2015 census conducted by the Associação Brasileira de Educação a Distância - Brazilian Association of Distance Education (ABED, 2015) accounted for 5,048,912 students, with 1,108,021 in fully distance education and hybrid courses and 3,940,891 in corporate or non-corporate free courses. The census shows that, in higher education, most of students are enrolled in teacher education courses. As presented in the census, 406 distance graduation courses are offered in Brazil; among those, 258 courses are related to teacher education. In terms of post-graduation, there are 1,079 specialization courses, 197 MBA and only 7 Master's courses. In basic education, there are 20 courses in middle school and 19 in high school. This DE framework is outlined mostly by technological advancements, increasing access to Internet and its digital resources as well as the legislation that governs DE in Brazil.

Law number 9,394 (1996), also known as *The Law of Guidelines and Bases of National Education* (LGBNE, henceforth), was the first one to tackle DE in Brazil. In its 32<sup>nd</sup> article, it establishes that elementary and middle schools activities must be carried out face-to-face, and DE is to be used to complement the process of teaching and learning in emergencies only. In its 80<sup>th</sup> article, it determines the role of public powers in the development of DE programs in all levels of education and continuing education. According to LGBNE, it is also up to the federal government to regulate DE courses concerning the examination, issuance of certificates and accreditation of institutions (Law n. 9.394, 1996). Borba, Malheiros and Amaral (2014) highlight that the LGBNE was aimed at presenting quantitative and qualitative goals for DE instead of treating it as an experimental project. In 2005, Decree number 5,622 was published to regulate the 80<sup>th</sup> article of LGBNE. In its first article, it characterizes DE as an educational model in which the didactic-pedagogic mediation in teaching and learning processes occurs with the use of media, information and communication technologies, with students and teachers developing educational activities in different places or times. Besides determining means and tools for mediation, it also brings up aspects of asynchronicity and territory dilution in the DE teaching and learning processes. This decree also organizes methodology, management and evaluation, as well as determines that face-to-face moments are mandatory for exams, trainings and laboratory activities. However, the complementary nature of DE remains. The decree maintains that DE is for emergencies, cases of health problems and places where there are no educational institutions.

Considering the importance of DE and the current legislation, MEC published the Quality Benchmarks for the Higher Distance Education (Benchmarks, henceforth) in 2007, which has no power of law. Instead, it is a guide to subsidize legal acts of the government to specific processes of regulation, supervision and evaluation (Ministry of Education and Culture, 2007). The Benchmarks emphasize that there are many ways of implementing DE courses and programs, which can have different design, methodologies and resources to meet students' needs and the context conditions. The document also acknowledges that DE has its own characteristics and language that requires consistent administration, design, evaluation, technical, technological, infrastructural and pedagogical resources. In this sense, DE also requires a political and pedagogical project that clarifies the concepts of education and curriculum in the processes of teaching and learning, communication systems, educational and evaluation materials. In addition, it should favor the formation of a multidisciplinary team, determine the infrastructure of support and, finally, keep academic and administrative management to define its financial sustainability. Therefore, the elaboration and implementation of DE activities, online and blended learning experiences, runs through different spheres. In supporting infrastructure, in Brazilian public educational contexts, we face lack of funds and resources, which interferes negatively in the offering of DE programs. For instance, the lack of connectivity or low speed connections are common in public schools and universities. In the sphere of the formation of a multidisciplinary team, human resources are scarce because of low hiring what leads to accumulation of tasks and functions.

In the Institute of Application (IA, henceforth), the landscape is not favorable because it faces problems in infrastructure and lack of material and human resources. Despite that, we proposed to build and provide a VLE to different levels of education in order to foster meaningful practices in both distance and blended learning in the institute.

### **The Institute of Application Fernando Rodrigues da Silveira**

The IA is an academic unit of the State University of Rio de Janeiro, which encompasses the axis of teaching, research and extension. It is a training field for graduation students from other institutes

in the university. It builds rich spaces for dialogue and experiences sharing among different areas of knowledge, which makes it suitable for multidisciplinary work and collective knowledge production. The IA is composed by a school where children and youngsters go to elementary, middle and high school; it offers mandatory subjects in graduation courses and hosts a postgraduate Masters' course. Nowadays, it has 1,030 students in basic education, 463 students in higher education and 120 postgraduate students, 189 teachers and 70 employees in the technical and administrative staff. The IA has also an exchange program with Tokyo University Foreign Students (TUFS). When students graduate from high school, they can apply to study in the Japanese university.

The benefits of the IA structure reside in fostering the cooperation between university and school, especially in teacher education to improve the quality of teaching in basic education. This occurs mainly because both university and school students share the same training space and all teachers in IA work in both levels: university and school. The IA structural organization requires that teachers must be formally qualified to work in basic education levels and in university, as well.

The diversity of activities of the IA demands different teaching processes to search means to provide access to accumulated and produced knowledge in varied areas as well as the production of new knowledge, to foster the dialogue between specific contents and teaching methods (Shulman, 1986).

Knowledge does not occur in a vacuum. Nor is it produced in isolation in classrooms and laboratories. Instead, it relates to participants' contexts and the world's realities. To make knowledge more accessible and contextualized, technology plays a fundamental role. Different technological resources (computers with Internet access, multimedia projectors, tablets, cell phones, etc.) can have different functions that range from material storage to generation of interactional spaces by means of information and communication tools, which are essential in knowledge produced in researches and didactical materials. Moreover, technologies in the educational daily life can favor new ways of communication and facilitate understanding of knowledge as a process, not a final product (Magnavita, 2003). In this way, the proposal of a VLE to different educational levels can contribute to more meaningful pedagogical practices in accordance to the IA amplitude.

### **The potentiality of blended learning in the Institute of Application**

Technology is present in all spheres of our daily lives and affects different sectors and areas. In education, for instance, digital technologies increased possibilities in different types of teaching. Romiszowski (2005) considers the integration of new electronic technologies to the practical realities of human communication is a kind of synergy, which affects DE, especially online learning. Nowadays, with the broad access to Internet and digital resources, not only can students search for materials, such as books and articles, but also need to establish relationships with others who belong to different cultures in order to interact and discuss topics of mutual interest.

The educational scope of IA congregates face-to-face and non-presential or online activities in different proportions according to the educational segment. Elementary, middle and high school students stay at school full time, which sums more than the 800 hours/year determined by the LGBNE. The activities are face-to-face mostly, while the non-presential ones have to do with homework, readings and researches. The IA has no official DE activities for basic education. On the other hand, in graduation courses, we gradually introduced the VLE aiming at building a digital repository for theoretical texts, didactical materials and students' productions. We also intend that it becomes a space for interaction between teachers and students to deepen discussions previously conducted in classrooms. Thus, our pedagogical practices move towards blended learning experiences. Graham, Allen and Ure (2005) highlight three advantages of seeking merged processes



of teaching and learning in higher education: more adequate pedagogical practices, access and expanded flexibility and increased cost-effectiveness. Concerning pedagogical aspects, the authors point out that merged teaching processes promote a more student-centered educational mode and facilitate interaction between individuals.

We can understand blended learning in different ways. The most common one associates face-to-face activities in classrooms with distance activities (online or not). It can be a way of teaching that combines face-to-face activities to distance ones, technologically mediated by computers and other technological resources (Graham, 2006). However, So and Bonk (2010) state that it is not enough to put the activities together to have successful blended learning experiences. The design is an important component and it is paramount that it integrates the activities in a coherent way in order to offer efficient contents and give support to students. Therefore, building a VLE to all educational segments in a public institute, such as IA, that faces shortage of human, financial and technological resources, constitutes a great challenge. Besides, it is necessary to deal with the characteristics and objectives of the segments. A VLE for students in basic education (children and teenagers) is different from one for undergraduate and graduate students. The processes of creating and delivering the VLE go through several stages and bring together different sectors of the university. Next, we describe the architecture and the design process of the VLE.

### **The Virtual Learning Environment (VLE) of the Institute of Application**

We elaborated the VLE in cooperation with Information and Communication Technologies Laboratory, an academic unit responsible for development and management of technological platforms in the university. This partnership was based on the division of labor according to the functional nature of each unit. The laboratory provides technological support and the IA is in charge of the design and administration of the VLE. This is already a difference in the VLE development since teachers design the tasks and develop the VLE in their professional practices in line with their subjects and students' needs.

Brazilian basic education is organized into pre-school, elementary school, middle school and high school (Fig. 1). The VLE was created to foster teaching-learning processes in six levels of formation. Its structure contemplates elementary school, middle school and high school as well as well as graduation, post-graduation and extension courses. Besides, a research group has requested registration in the VLE to help their activities.

Each level or course has a different design to meet specific needs. Elementary school is the first level, from 1<sup>st</sup> to 5<sup>th</sup> grades and students' age range from 6 to 11 years old. The group encompasses 60 students, organized into 3 classes of 20 students. Teachers mediate the activities in the VLE in all subjects, except Visual Arts, Music and Physical Education. However, in the VLE, all the students integrate the same grade (1<sup>st</sup>) of elementary school (Fig. 2). The horizontal integration of these groups enables collaborative performing tasks, contributing to the critical development and enhances socialization.

Middle school students' age ranges from 10 to 16 years old and they are organized into the 6<sup>th</sup> to 9<sup>th</sup> grades, which encompasses about 120 students in 4 groups of 30 students. This segment has a multidisciplinary formation with about 10 subjects mediated by different teachers. Thus, the VLE was organized in order to promote interdisciplinary actions, considering each group as a course (Fig. 3).

In high school, the courses are organized into knowledge areas aiming at scientific preparation and the ability to use different technologies to perform (MEC, 2000). Each grade has around 100 students, distributed in 4 groups of 25 students (Fig. 4).

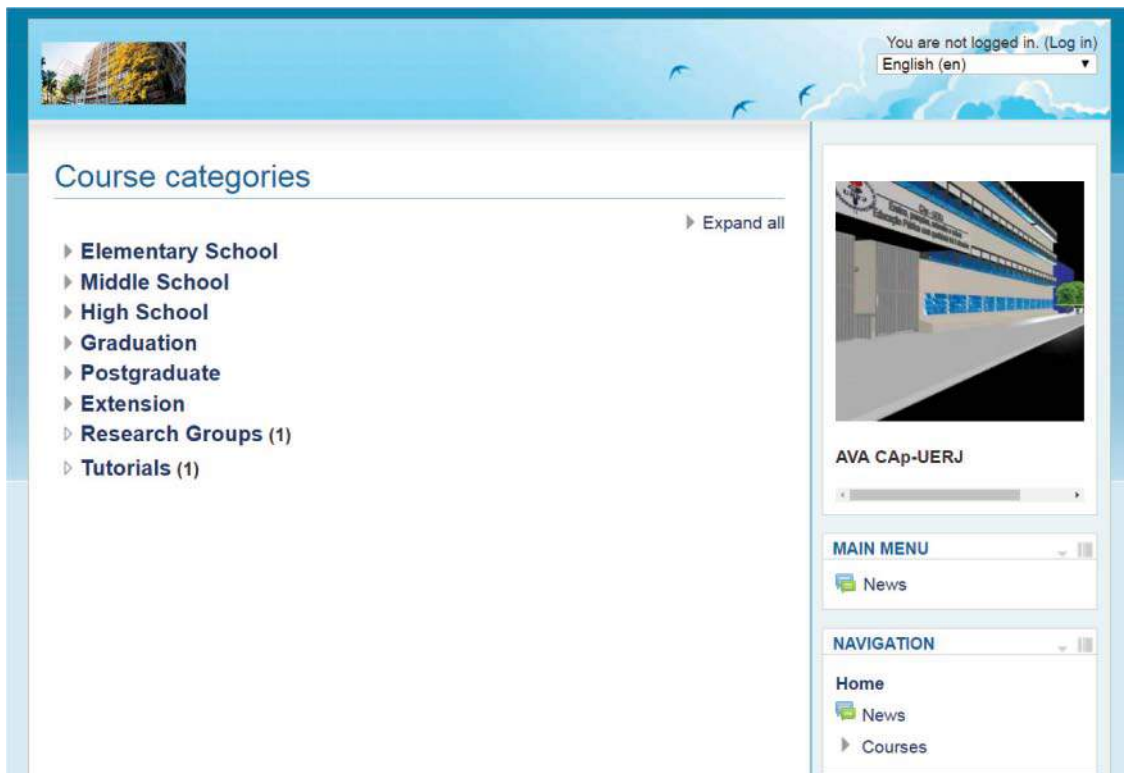


Figure 1: The levels of formation and courses in the VLE



Figure 2: 1<sup>st</sup> grade organization in the VLE

Ambiente Virtual de Aprendizagem do Instituto de Aplicação Fernando Rodrigues da Silveira

You are not logged in. (Log in)

HOME > COURSES > MIDDLE SCHOOL > 7TH GRADE > CLASS 71

Search courses:  Go

Course categories:  
Middle School / 7th Grade / Class 71

- Natural Sciences
- Technical Drawing
- Physical Education
- Geography
- History
- Portuguese Language
- Mathematics

**NAVIGATION**

- Home
- News
- Courses
  - Elementary School
  - Middle School
    - 6th Grade
    - 7th Grade
      - Class 71
        - CIE71/2016
        - DES71/2016
        - EDF71/2016
        - GEO71/2016
        - HIS71/2016
        - POR71/2016

Figure 3: Middle School Organization in the VLE

Ambiente Virtual de Aprendizagem do Instituto de Aplicação Fernando Rodrigues da Silveira

You are not logged in. (Log in)

HOME > COURSES > HIGH SCHOOL > 10TH GRADE > ARTS

Search courses:  Go

Course categories:  
High School / 10th Grade / Arts

- Visual Arts
- Design
- Photography
- Music
- Drama

**NAVIGATION**

- Home
- News
- Courses
  - Elementary School
  - Middle School
  - High School
    - 10th Grade
      - Class 1A
      - Class 1B
      - Class 1C
      - Class 1D
    - Arts
      - AVI10/2016
      - DSG10/2016

Figure 4: High School Organization in the VLE

At the university, teacher education occurs in undergraduate courses, whose activities relate to subjects of specific content of knowledge area and pedagogical subjects. The former varies according to the knowledge area (math, science, languages, etc.); the latter refers to teaching itself, and includes teacher training and practical and methodological subjects.

The VLE design established correspondence between the teacher education courses and the virtual classroom (Fig. 5). This gives opportunity for future teachers to experience the production of didactical materials and in DE practices.



**Figure 5: Teacher Education Course Organization in the VLE**

The extension courses are the ones that meet the needs and expectation of the external community. Consequently, they do not have a previous configuration so that the courses can meet the needs of each proposal (Fig. 6).

The post-graduation consists of two categories: post-graduation itself and research groups, with very different purposes. The research groups have internal activities such as forums and research activities and function as digital repositories for the group production. That is why they should be visible in the menu and grant access to contents (Fig. 7).

### **Collaborative construction of design as development methodology**

Collaboration and similar experiences sharing contributes to developing awareness about one's own actions in a VLE (Jesus, Figueiredo & Ribeiro, 2016). By choosing a collaborative development method over a technical and specialized one, we seek to contribute to teachers' actions that are more autonomous. This leads to the option of batch registration, for instance. Due to operational aspects, batch registration makes the process of enrolment and support faster since teachers compile the demands and send them to the VLE administrator. This avoids a large number of similar requests and congestion of access channels, which compromises service quality.

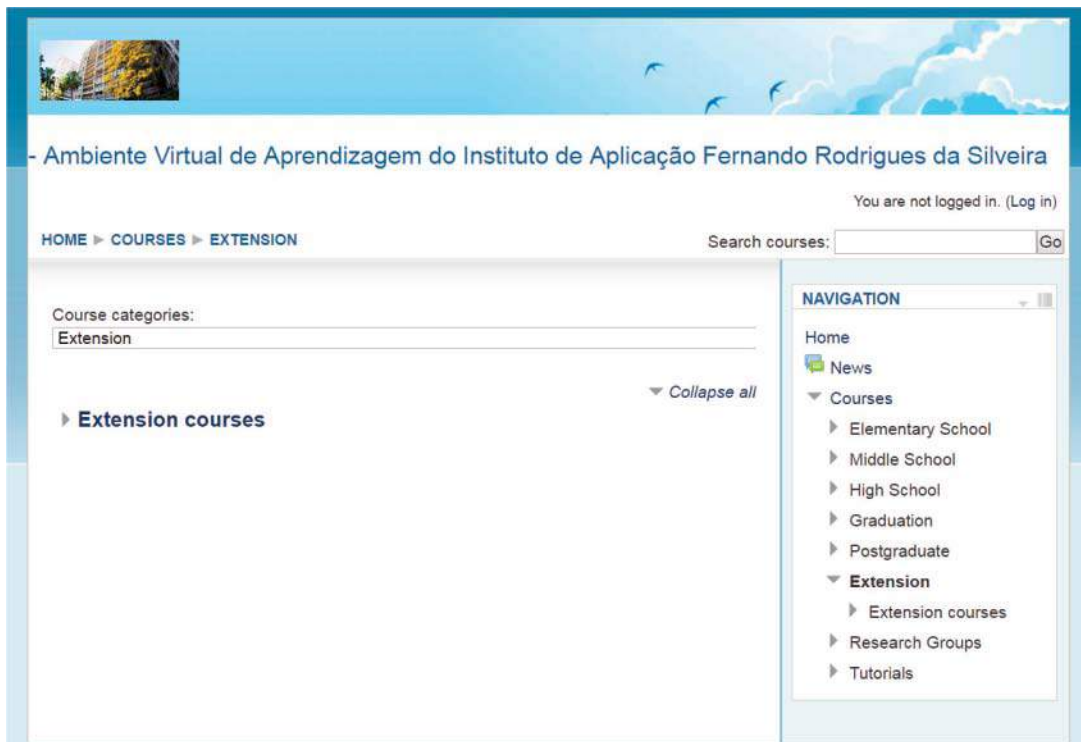


Figure 6: Extension Course Organization in the VLE

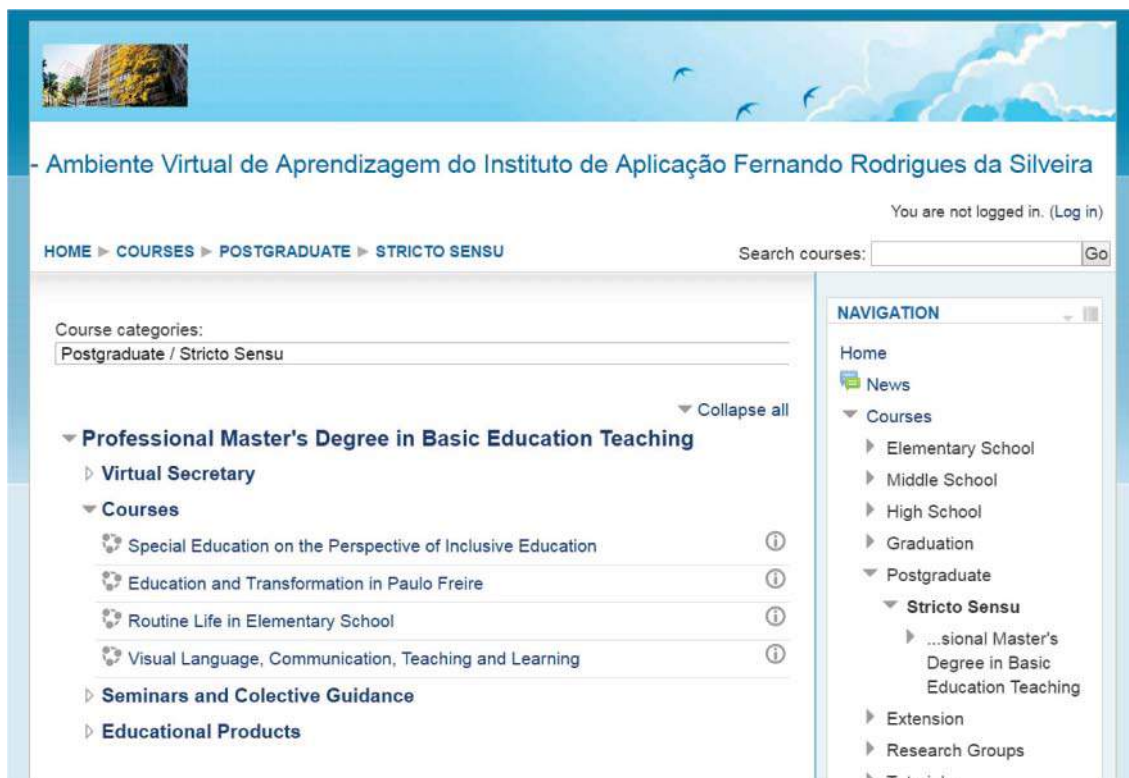


Figure 7: Post-graduation Organization in the VLE

We planned the collaboration process in different pillars. Firstly inside the courses, as it is typical of DE models. Teachers participate by their own initiative or by answering a previous consultation by means of interviews and questionnaires. The second pillar is set after the registration and enrolment in the VLE, when teachers began to work with peers and students to implement activities in the VLE. The third pillar is constituted by research dissemination events and sharing of research experiences and results both in and outside the university.

It is important to highlight that teachers' contribution to the process is validated by the diverse actions in formation contexts in the IA. Most of teachers work in more than one level of formation because the political and pedagogical project of the IA establishes that every teacher should work in basic education settings as well as in graduation, extension and post-graduation courses. The VLE is institutional; however, participating in the VLE is optional, that is, teachers can choose if they are going to use the VLE resources or not. Despite that, it is possible to notice the quantitative and qualitative evolution of the participations.

### Current Stage of the Virtual Learning Environment (VLE) in the institute

The VLE has, nowadays, 295 registered users with attributed role of "teacher" or "student". There are 306 attributed roles so far. This difference is justified by the fact that a user can be enrolled in different courses with different roles. Concerning the three axis of teaching, research and extension, the extension one had largest number of registrations. The majority of users and attributed roles is in the extension course *Constituting the Collaborative Education in Baixada Fluminense*, with 183 registered users (about 58% of total number of users). 10 users assume the role of teacher and 173 of student.

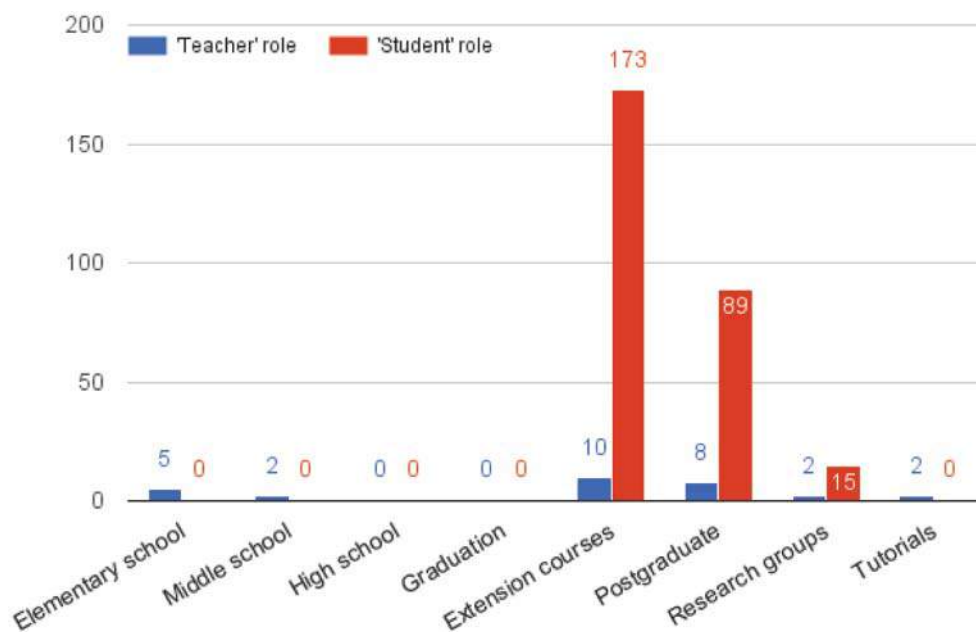
In post-graduation, there are 97 registered users (about 31% of total registered users), participating in four courses: *Special Education in the Perspective of Inclusive Education* (2 teachers and 18 students); *Education and Transformation in Paulo Freire* (1 teacher and 20 students); *Daily Life in Elementary School* (2 teachers and 28 students) and *Visual Language, Communication, Teaching and Learning* (3 teachers and 23 students).

*Language and Education: Teaching and Science* is the only research group in the VLE so far, with 17 registered users (about 5% of the total users): 2 teachers (the group leaders) and 15 researchers and post-graduation students whose attributed role is student.

In this initial stage, teachers use different resources in the VLE platform: insertion of content by means of verbal and non-verbal texts (images, videos etc.), collaborative activities (thematic forums, database building), cooperative management of the subjects and feedback, which provides information to foster our interventions. Students' most common demands relate to technical support: problems about passwords, difficulties to access and find contents and activities within the courses. This happens mostly due to lack of previous technical knowledge and little familiarity with the environment. Some teachers point out that many students do not consider the VLE a legitimate tool and space to interact and deepen discussions and concepts studied in the classroom. Most of them view it as a repository of materials and texts. For instance, there are postgraduate students who send messages via e-mail or WhatsApp instead of participating in the forums and other activities in the VLE. On the other hand, teachers are concerned with technical training to use the VLE and its tools. They indicate the necessity of larger workload to develop projects and products. They also state that the use of the VLE should be encouraged. They consider that we should share knowledge about the use of the environment *vis-à-vis* the ongoing researches in the institute.

Concerning basic education, there are no registered students in the VLE so far. This can be justified by the fact that the digital environment is relatively new to the community of the institute.

Teachers have gradually shown interest in integrating it with their pedagogical practices in presential classroom. To do so, we intend to seek strategies to disseminate and insert the VLE in pedagogical activities. Training courses and workshops have been developed and offered to meet teachers' demands and needs. Since the participation of basic education students in the VLE depend on their teachers' registration and effective use of the environment and use it as a pedagogical tool, we expect that the number of basic education students registered in the VLE will increase as more teachers decide to use it, as well. According to figure 8, there are 295 users today. 97 are in post-graduation segment (89 students and 8 teachers). Our goal is to include all basic education students in the VLE until November 2017.



**Figure 8: Registered Users in the VLE**

Building cooperation between school and university is challenging. Teachers and students have different knowledge, experiences and opinions concerning blended learning experiences. In order to find solutions and strategies that can contribute to learning and teaching processes at school, to teacher education and to research in education, school / university cooperation is established by the articulation of the objectives of both: the first to produce a competent basic education process and the second to form good teachers for basic education. Based on this, shared actions are elaborated and developed. Some of them take place in common space-times, such as the school's classrooms. Others occur in specific places, such as laboratories of teaching research and research group meetings. The design of the VLE reflects not only the curriculum organization of the educational segments, but also the actions taken by the participants in its scope.

### Next stages to implement the Virtual Learning Environment (VLE)

In 2017, blended learning experiences consolidation will take place in three dimensions: full coverage of the virtual rooms in all segments, building a broad multidisciplinary collaborative network, expansion of epistemological and methodological perspectives and search for partnership with external sectors to foster research and extension actions.

The networking of studies and production in the IA will encompass a set of integrated actions, such as surveys with the VLE users; interviews with teachers working in the virtual classrooms, forums and seminars to share methodologies and pedagogical practices, workshops to develop technical skills. We expect that this set of actions will contribute to meet the target public needs.

We intend to expand dialogue with external communities according to the professional demands of the ones who work in basic education by means of extension courses. In the field of research, the inter-institutional cooperation is already in progress. The National Institute of Science and Technology: teaching and communication—creativity, innovation and technology in teacher education includes 40 Higher Education institutes all over Brazil and the IA is one of them.

In addition, the VLE is meant to be a space and a tool for interaction and collaborative learning and teaching. Thus, the data obtained from the different participants (basic education, graduation and post-graduation teachers and students) will contribute to investigate and analyze their ways of participation and engagement in the different levels of formation. We intend to conduct studies on mediation, access patterns in the different age groups and schooling levels. Since teachers and students will probably present their points of view and report their experiences in using the VLE, we expect that they mention aspects of usability to meet students' and teachers' needs and aptitudes. Therefore, the data obtained will also contribute to design improvements.

Besides that, it will be possible to understand how learning takes place from the insertion of the VLE and its impact on teaching quality.

In this way, the VLE will be opportunity to foster teacher and student participation and to create spaces for discussions and exchange of experiences and knowledge.

## Conclusions

We presented and described the proposal of blended learning experiences in a VLE in IA to establish the bases of comparison for the next studies. Different aspects of basic education and teaching methodologies are potential objects of inquiry in different educational segments. We intend that our reflections on teaching and learning digital contexts will gain prominence when we identify and understand new forms of interaction and communication, creating knowledge-building opportunities in everyday school life.

Reflect upon building and implementing a VLE in different segments of education brings about the consideration of different spheres of teaching and design.

Up to the current stage, we have reached some provisional findings about the different levels of formation in basic education, graduation and post-graduation courses. In general, we notice that most teachers are not well prepared to include the VLE in their pedagogical practices. They tend to underutilize the technical resources (for instance, use it as a digital repository of texts) instead of promoting more meaningful teaching practices that meet students' needs in a digital era that requires new social practices.

Especially to basic education students, the individual differences demand plural pedagogical practices. In this sense, the VLE makes possible the use of different languages and multimodal texts, which can contribute to better learning. Besides that, the VLE minimizes the frontiers between schools and other learning spaces, since it can be accessed from different places.

We strongly agree that we should promote the use of VLE despite the infrastructural and technological problems in public institutions in urban and rural areas. Brazilian continental dimensions call for the dissemination of blended learning experiences to promote intertwined practices of local and social accumulated knowledge and, thus, helping to foster means to more meaningful learning (Ausubel, 2003).



## References

- Ausubel, D. P. (2003). *The psychology of meaningful verbal learning*. New York: Grune & Stratton.
- Borba, M. de C., Malheiros, A. P. dos S. & Amaral, R. B. (2014). *Educação a distância online* (4th ed.). São Paulo: Editora Autêntica.
- Associação Brasileira de Educação a Distância (2015). *Censo EAD.BR: Relatório Analítico da Aprendizagem a Distância no Brasil 2015*. ABED.
- Decreto n. 5.622, de 19 de dezembro de 2005. (2005). Retrieved from <http://portal.mec.gov.br/sesu/arquivos/pdf/portarias/dec5.622.pdf>
- Graham, C. R. (2006). Blended Learning Systems: Definition, Current Trends, and Future Directions. In C. J. Bonk & C. R. Graham (Eds.). *The Handbook of Blended Learning: Global Perspectives, Local Designs* (pp. 3–21). San Francisco, California: Pfeiffer.
- Graham, C. R., Allen, S. & Ure, D. (2005). Benefits and Challenges of Blended Learning Environments. In M. Khosrow-Pour (Ed.). *Encyclopedia of Information Science and Technology* (pp. 253–259). Hershey, Pennsylvania: Idea Group.
- Jesus, D. M. de, Figueiredo, F. J. Q. de & Ribeiro, A. da S. M. (2016). Estudos sobre a colaboração e a interação em diferentes contextos de ensino e aprendizagem de línguas em ambiente digital. In L. A. de Sá, Jr. & M. A. Martins (Orgs.). *Rumos da linguística brasileira no século XXI: Historiografia, gramática e ensino* (pp. 227–249).
- Law n. 9.394, December 20, 1996. (1996). Retrieved from [http://www.planalto.gov.br/ccivil\\_03/leis/L9394.htm](http://www.planalto.gov.br/ccivil_03/leis/L9394.htm)
- Magnavita, C. (2003) Educação a distância: desafios pedagógicos. In L. R. G Alves & C. C. Nova (Orgs.). *Educação e tecnologia: trilhando novos caminhos*. Salvador: Editora da UNEB. Retrieved from <http://softwarelivrenaeducacao.wordpress.com/2009/10/20/leitura-online-educacao-e-tecnologia-trilhando-caminhos/>
- Ministry of Education and Culture (2000). *Parâmetros Curriculares Nacionais (Ensino Médio)*. Brasília: MEC.
- Ministry of Education and Culture (2007). *Referenciais de qualidade para educação superior a distância*. Brasília: MEC. Retrieved from <http://portal.mec.gov.br/seed/arquivos/pdf/legislacao/refead1.pdf>
- Romiszowski, A. J. (2005). Online learning: are we on the right track? In G. Kearsley (Ed.). *Online learning: personal reflections on the transformation of education*. New Jersey: Educational Technology Publications.
- Shulman, L. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, 15(2), 4–14. <https://doi.org/10.3102/0013189X015002004>
- So, H.-J. & Bonk, C. J. (2010). Examining the roles of blended learning approaches in computer supported collaborative learning (CSCL) environments: A Delphi study. *Educational Technology & Society*, 13(3), 189–200. [http://www.ifets.info/others/abstract.php?art\\_id=1072](http://www.ifets.info/others/abstract.php?art_id=1072)

# OPEN PRACTIS



INTERNATIONAL  
COUNCIL FOR OPEN AND  
DISTANCE EDUCATION