



Evaluation of a MOOC pilot: impacts on pedagogical and technical design and dementia education research

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This paper presents the evaluation of the pilot of a Massive Open Online Course (MOOC) called *Understanding Dementia*. The business case identified potential benefits of: ability to deliver high quality expert knowledge about dementia on an international scale; a dataset for dementia research of international perspectives on dementia care; enhanced reputation of the University and providing a pathway to traditional course for non-traditional students. The development team used a design-based research approach guided by the evaluation-research framework for e-learning and the concept of an 'e-learning life cycle' in (Phillips et al. 2012). The paper describes the evaluation-research design and results for the pilot phase. It shows how data analysis from the pilot informed the pedagogical and technical aspects of the learning design for the first full release and the value of a planned, evaluation research approach informing design from pilot to maturity.

Keywords: MOOC pilot; dementia education; evaluation-research design

Background

Relatively new in higher education, the Massive Open Online Course (MOOC) phenomenon has been discussed at conferences, in education literature (Haggard 2013), and online media dedicated to academic concerns (for example, *University World News* (www.universityworldnews.com)). MOOCs are considered a new field of teaching endeavor and an emerging field of educational research with potential impact on an education institution and on learners. Burning issues are 'the exploration of a viable business model and the accreditation of MOOC learning' (Haggard 2013, p. 7). Early evidence indicates that poor educational design, technical problems affecting access and/or navigation negatively affect the reputation of the institution associated with a MOOC; good design is critical to minimise risks and achieve benefits at a manageable cost.

There is no financial cost for participating in a MOOC and no limit to the number of enrolments. For the Wicking Dementia Research and Education (Wicking) Centre, the considerable cost of creating the *Understanding Dementia* MOOC was off-set by the expected benefits. The Wicking Centre integrates research and education; its activities are framed by the concept of ‘quality of life across the trajectory of dementia.’ MOOC-scale delivery of the Centre’s expertise was envisaged as an opportunity to provide a high-quality educational experience that would make a difference to people’s understanding of dementia, potentially having an impact on decision-making and improving the quality of care. An anticipated research benefit was an international dataset of participant experiences and perspectives on dementia knowledge (King et.al 2013).

The *Understanding Dementia* MOOC is an 11-week course that is open to students internationally. The target audience is anyone with an interest in dementia, whether in a personal or professional capacity, however it is largely designed for those who traditionally do not attend university. Students do not formally enrol at the University of Tasmania; rather they register in the open instance of the university’s learning management system. The MOOC is designed to include articulation to the University of Tasmania’s new Bachelor of Dementia Care. This paper will set out the methodology for evaluating the *Understanding Dementia* MOOC during the preliminary design phase. It will present the results of the 3-week pilot release in terms of the implications for pedagogical and technical design, as well as reflecting on the benefits of a designed evaluation framework to inform a MOOC approach.

Methodology

The disruptive character of MOOCs, with associated risks and uncertainties, warranted a research-oriented project management approach to ensure a solid evidence base for pedagogical and technical decisions. The *Understanding Dementia* MOOC was developed using a design-based research approach (van den Akker et al. 2006) scaffolded by the (Phillips et al. 2012) Educational Evaluation Research (EER) framework. The research has three broad phases, aligned with the life-cycle of a learning design (Phillips et al. 2012): P1) pilot; P2) full release (revise for quality improvement); P3) mature design (evaluate for impact and effectiveness).

The preliminary learning design was developed within the context of a decision to invest (primarily human) resources to gather and analyse data to underpin each phase of decision-making. The development of the MOOC included three foci of design activity: F1) pedagogical; F2) technical and; F3) dementia research. The pedagogical and technical design process is detailed in (King et al. 2013). The pedagogical design was informed by research into teaching as a design science (Laurillard 2002) and technology-enhanced learning, for example, as Collis (1996) and Herrington et al. (2010). The EER framework was followed to identify research questions appropriate to the stage of the *Understanding Dementia* MOOC’s design life cycle, data sources and appropriate methods of analysis for each data set (Phillips et al. 2012). This paper describes the evaluation-research approach for the three foci of design activity, and results for the pilot phase of the MOOC. The data analysis from the pilot informed the pedagogical and technical aspects of the learning design for the first full release and also provided insights into possible data sets for dementia research that might be embedded into the MOOC.

Evaluation-Research Design

The *Understanding Dementia* MOOC took a cohort-centric approach to course structure and design (King et al. 2013). Although the content was structured to be broadly appealing to a general audience, it was considered important, in the baseline period of design, to identify cohort characteristics of relevance to the learning design. Based on the dementia education and research expertise of the Wicking Centre, the MOOC was designed to primarily appeal to care workers in the aged care sector, typically women, aged above 40 or people with a personal interest. Therefore, the design did not presume any level of prior tertiary education or technical proficiency. The 3 week pilot was released in April 2013. Pilot design details are reported in (King et al. 2013).

The pilot was a soft launch with 184 participants: initially academics and students were recruited from the Wicking Centre and two Schools in the Faculty of Health Science; ‘word of mouth’ and social media generated participants from a diversity of backgrounds Australia-wide. Table 1 summarises the data sets collected during the pilot and the relationship to the research questions and three foci of the design (P: pedagogical, T: technical, D: dementia research). The research questions for the pilot pertained to the pedagogical and technical design of the MOOC, as well as whether participant activity would deliver meaningful data for dementia research.

- [1] What is the educational background of participants in the *Understanding Dementia* MOOC pilot?
- [2] What are the motivations and expectations of students undertaking an *Understanding Dementia* MOOC and the level to which they are met?

- [3] What is students' baseline knowledge about dementia (pre-) and increase in knowledge (post-MOOC)?
- [4] What are students' experiences and observations of the pilot MOOC design in terms of structure, useability, accessibility, navigation and support?
- [5] What data generated by participants in an Understanding Dementia MOOC could be useful to gain an international perspective on the major issues relevant to dementia?

Table 1: Relationship between the data sets, research questions and MOOC design focus

Data Sets [related pilot research question]	P	T	D
Registration (demographics) [1]	x		x
Baseline Survey (educational background; motivation) [1]	x	x	x
Dementia Knowledge Survey (DKAT-2®) (Toye et al. 2007) [3]			x
Early Exit Survey (automated: reasons for exiting; feedback) [4]	x	x	
Feedback Survey (solicited: content; delivery; technical design) [4]	x	x	
Reflective Writing (reflection on and about content) [5]			x
Discussion Fora (multiple fora on range of topics) [5]	x	x	x
Email Feedback (unsolicited) [4]	x	x	x
Verbal feedback (solicited) [4]	x	x	
Analytics (quantitative data generated by MOOC platform)	x	x	x

Pilot data from the *Registration* and *Baseline Survey* was analysed primarily to inform pedagogical and technical design questions for phase (2) full release of the MOOC. The evaluation for this phase was focused on pedagogy and dementia research, directed toward student retention and progression, sourcing data for both education and dementia research. An iterative evaluation-research approach in the revision and growth phase informed the refinement of core material and the development of extension material.

Pilot results: pedagogical design implications

Both qualitative and quantitative pilot data informed our pedagogical design. Data fields in the *Registration* data collection provided quantitative data about the demographic spread of participants. A *Baseline Survey* was incorporated to obtain participants' background education and reasons for undertaking the course, and to enable a more detailed assessment of cohort characteristics. Cultural and/or other demographic data was used for the revision and refinement of material, including technical support. Combined, the two data sets provided qualitative data on, for example, how many participants had previously participated in a MOOC, levels of computer literacy and participant expectations of the *Understanding Dementia* course.

As a general observation, it was clear from *Discussion Forum* data that the majority of participants were comfortable introducing themselves to the other participants and discussing why they were undertaking the course. However, when it came to engagement with the course material via discussion forums and a requirement to contribute via research or personal thoughts on dementia-related questions, numbers dropped dramatically. The *Feedback Survey* at the conclusion of the pilot contained a number of questions relating to discussion forums confirmed that participation was an issue for some: "Maybe it is my age but I am not really comfortable sharing thoughts etc with strangers. Maybe as the course progressed I might feel more comfortable with using this medium." (C1); "I would probably still only use [discussion boards] if I knew my questions were being answered by a subject expert." (C2). (*Comments are anonymous and numbered sequentially*).

In response to resistance to discussion participation in the pilot, an original concept for discussion forums was devised for the full release version, called the 'thought tree.' A thought tree begins with a statement, for example, "quality of life for me means ..." and enables participants to contribute their own thoughts in a less threatening space by adding to the major thread or adding threads (branches) of their own. No background knowledge is required. Additionally, 'ask an expert' was introduced into the course design.

The pilot *Feedback Survey* was completed by 28 people, out of the total 128 active participants; it provided the majority of useful information for the learning design of the full release. For example, additional activities and scenarios were included in the full release design, with extra 'hints' and 'feedback' features that appear when selected by participants, in response to comments such as, "I was finding it difficult as there was not much feedback. I thought there would be feedback on our notes that we wrote? I guess you would see an assignment question or essay if you were doing the course proper?" (C3). Another participant stated that they would like, "... more videos of stories from people with dementia, there are some great blog sites that people with dementia participate in and tell exactly how it is for them" (C4). This led to including contributions from both a person with dementia and a family carer of someone with dementia in the full release content. Additionally, "Is there a

glossary attached to each unit? Perhaps that could be used in conjunction with the text you present” (C5) prompted the development of a glossary specifically for the *Understanding Dementia* course. The definitions included in the glossary were written to contextualise the terms within this learning environment, rather than being derived from definitions from the Internet.

The expertise of the Wicking Centre in dementia research and education is a key value proposition for participating in the *Understanding Dementia* MOOC. Thus the feedback, “Although labelled with Wicking and University of Tasmania I didn't feel the content demonstrated how these groups were at the forefront of the field” (C6), led us to develop a Profiles page of content developers to explain their association with the Wicking Centre and their professional credentials. Similarly, an introductory course overview page was added in response to, “Maybe have a course overview first so we know what's available and where” (C7).

Unsolicited *Email Feedback* provided insights that influenced subsequent course design. The feedback, “if there was only one question at a time in the windows rather than 3-4 which became a bit overwhelming” (C8) resulted in a design change with the separation of individual questions, such that only one could be dealt with at a time. The suggestion of providing, “more signposting of key issues raised in some of the videos etc, just to scaffold the learner to identify they key messages” (C9) and, “Are you considering placing text within the videos to reinforce key concepts? (C10), led to including a slide after each video clip summarising major points covered.

Pilot results: technical design implications

It became evident during the pilot phase that providing one-on-one *ad hoc* technical feedback was not scalable for a massive cohort. The team therefore devised a self-help discussion forum, as well as online help guides and a ‘frequently asked questions’ page. The *Feedback Survey* included comments on the course content, aesthetic qualities of layout and styles, audio and video quality, and navigational aspects of the learning environment. The team responded to one comment, “It would be nice to have a recorded video that showed how to move through the main parts of the MOOC” (C11), by designing an orientation module for the course that would precede any content modules. The general layout and important aspects of the learning environment were demonstrated via video screen captures supported with text instructions.

The *Feedback Survey* also provided a range of information relating to technical issues, early withdrawal explanations, feedback, suggestions for improving the course and queries. Insights on technical barriers to accessing the MOOC, such as “I had to pull out of MOOC due to slow connection. Your course was video intensive.” (C12) and “Is there any other way I can access the course?” (C12) led to plans for text transcripts and discussion questions in an e-book format. In response to a participant suggestion, “I am finding the information quite passive and serious, and needs to be a bit more interactive to feel more engaged. ... Maybe a case study in a cartoon format.” (C13), the team developed a series of scenarios in cartoon format, accompanied by hints and feedback. Each of the cartoons relate to a family, ‘the MOOC Family’ who talk about dementia issues.

Personal Communication with participants produced further informative and useful information that was incorporated into the full release course design. For example, one participant mentioned that they had been given a warning from their network provider that they had reached their download limit. In response to this feedback the default resolution of video clips was lowered to reduce the impact on download capacity. *Discussion Forum* data included a technical forum discussion that provided useful information during the pilot. The MOOC development team endeavoured to deal with each technical issue as it arose. Many bugs relating to configuration issues and design faults in the learning management system were reported. Information about issues that were dealt with and any unresolved issues were forwarded to the platform developers.

Conclusions

The *Understanding Dementia* MOOC was, and is, underpinned and informed by a systematic evaluation research approach over three broad design phases of pilot, full release and mature design (Phillips et al. 2013). Evaluation data informed three foci of design: pedagogical, technical and dementia research. This paper has presented the outcomes of phase 1, pilot MOOC. The pilot enabled evidence-based changes to the technical and pedagogical aspects of the design for phase 2, the 11-week full release MOOC. In particular, solicited data such as *Registration*, *Baseline Survey* and the *Feedback Survey* provided actionable information to achieve designing for learning needs and expectations of the cohort. It is also clear that the *Discussion Forum* and *Reflective Writing* tasks embedded in the MOOC will provide dementia researchers with a rich data set for investigating international perspectives on dementia.

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Please cite as: Kelder, J-A., King, C., Carew, T. and O'Reilly, J. (2013). Evaluation of a MOOC pilot: impacts on pedagogical and technical design and dementia education research. In H. Carter, M. Gosper and J. Hedberg (Eds.), *Electric Dreams. Proceedings ascilite 2013 Sydney*. (pp.456-460).

<https://doi.org/10.14742/apubs.2013.1481>

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