

TURN ON YOUR PHONES PLEASE: FROM DISTRACTION TO ENGAGEMENT WITH MOBILE LEARNING

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Abstract

In one month, D2L, the learning management system (LMS) at the University of Manitoba, recorded over 6,000 occurrences of students accessing the LMS from mobile devices: Students were communicating through their actions that it was time to change the way we thought about course design. This article presents results of two separate research projects designed to inform practice at the University of Manitoba with regard to the use of mobile devices in fully online courses: First, the results of a study evaluating the limitations and opportunities for BYOD (Bring Your Own Device) mobile access to courses that have not been designed for mobile devices. Next, the results of a second study examining best practices for course design to facilitate greater opportunities for learning through the LMS and mobile devices are shared. Finally, building upon the results of the previous two studies, the implications for enhancing engagement in face-to-face classes using mobile devices are discussed.

Introduction

According to the International Data Corporation (IDC) (2015), worldwide sales of smartphones and tablets have now overtaken the sales of desktop PCs. They further predicted that by the end of 2017 fixed PCs will only be a small percentage of the devices connected to the Internet. In recognition of this phenomenon, Instructional Designers at the University of Manitoba (UofM) began to explore the strengths and limitations of mobile learning in our context. Our first experiences with mobile learning (m-learning) were based in responses to student demand and use. We tried to determine how we could compensate for the distractions of the limits of these devices. We then moved to an examination of the opportunities for improving student engagement and learning within our courses by capitalizing on the affordances of these devices to improve our course design. This paper is divided into three parts that reflect the different stages of our study. In Part One of the paper, we outline the results of an evaluation of the mobile accessibility of our current online course content. In Part Two, we illustrate our approach to learning design and assessment, in particular how it capitalizes on the affordances of mobile devices through a case study. Finally, in Part Three, we have share some practical considerations for instructors interested in adopting mobile devices for blended or technology enhanced face-to-face instruction, with increasing engagement as the core motivation for adoption.

Part One: Why Worry about Mobile?

Both in observation of student activities and from a review of consumer statistics we determined that mobile devices have become an important part of students' daily lives. Unknown, however, was whether these devices were being used for educational purposes and, if so, and to what extent. That is, was mobile access something we needed to be concerned about in our course design? To begin to answer this question we examined the access records provided to us by our Learning Management System (LMS). During a 30 day period of monitoring, the UofM recorded over 6,000 occurrences of students accessing the LMS with mobile devices (G. Watt, personal communication, February 26, 2013).

Both enrollment patterns and student surveys indicated that UofM students chose online education because of its flexibility and the quality of their learning experiences. Online students and particularly adult continuing education learners who we have focused on in the case study in Part Two of this paper exhibit a low tolerance for course offerings that are not specifically tailored to their career goals and preferred timelines of access and completion (Sloane-Seal, 2011). If mobile was how students were accessing our courses, we needed to respond to their preferences or risk losing their interest. Our first step was to establish a baseline of information on our current courses. To what extent were the courses accessible to mobile devices, and were our design choices favouring one device brand or type over another? During the 2012-2013 academic year, the instructional design team assembled a range of mobile devices using different operating systems (IOS, Android, and Blackberry) in order to determine the compatibility of our LMS with the most commonly purchased devices, as well as to determine if our course design was meeting the needs of students attempting to access courses through mobile devices. Each of the six design team members tested each device independently through trial and error experimentation with randomly selected course offerings found within the department. The results were correlated and four critical considerations that impacted m-learning in our environment emerged:

- Most courses were accessible with mobile devices, but few were designed to take advantage of the assets of mobile devices.
- The Web browsers available for Android-based devices were incompatible with several features of the LMS; for example, the discussion forum was severely restricted using the native browser of some Android devices.
- Not surprising, many of our courses contained Adobe Flash-based exercises that would not work with Apple IOS.
- The full features in Adobe Connect (a synchronous platform for virtual classroom events) were not available using the mobile software application.

These factors allowed us to inform both students and faculty about the limitations of mobile devices in conjunction with the software tools we had available. We were then able to design information packets to assist students to overcome these limitations so that they could access course material from mobile devices. However, overcoming the limitations was not the primary intent of our examination of m-learning. We wanted to use mobile devices to enhance learning.

Part Two: How Could You Redesign a Course to Enhance Learning with a Mobile Device?

Following our device testing project, we began to proactively design course structures for mobile access, as opposed to simply reacting to student demand with course modifications. In recent years, many innovative applications of mobile technology have been proposed and implemented within educational offerings (Ally, 2009; Kozuma & Anderson, 2002; Stanton & Ophoff, 2013; Ting, 2013). However, like our project, these projects have been limited in scale to pilots and standalone courses rather than programmatic approaches. Previous research in the area of m-learning indicated the advantage of mobile devices is more complex than “anywhere anytime” access to course content but served to provide learners with a social connection to the course cohort that was beneficial to learning (Clothier, 2013; Koole, 2009; Ting, 2013). Koole (2009) proposed the FRAME model for not only describing the interactions that occurred within m-learning design, but also as a means to evaluate m-learning effectiveness. Within FRAME, three key areas were identified in a Venn diagram of intersections between the device (D), learner (L) and social(S) aspects of a learning experience. When these intersections were balanced, idealized m-learning could occur (Koole, 2009). Stated in terms of practical application rather than theoretical modelling, the opportunity for mobile enhanced learning design lies in its ability to be a ubiquitous, social, context sensitive, personalizable, and collaborative experience (Ozdamli & Cavus, 2011). In addition to Koole’s (2009) model, various other frameworks for evaluating mobile learning have been developed (Sha, Looi, Chen, Seow, & Wong, 2010; Venkatesh, Thong, & Xu, 2012; Williams, 2009), however the question of how best to implement mobile learning in formal education remains unanswered. What does good m-learning design look like in practice? After a review of current literature, we selected the work of Paul Clothier, an instructional designer in the corporate sector, as a starting point for our design. Clothier’s work was selected because he has set out a series of simple mobile design principles that could be applied without significant investment in technology specialists. In other words, he outlined design features that anyone teaching online could apply within a course, regardless of budget. Clothier’s (2013) design principles included the following:

1. **Reduce clutter:** Present learners with a simple interface to facilitate reading on the small screen.
2. **Present information bites:** Typically, students access their mobile devices for small chunks of learning and it is important to organize the material so that it accords with this usage pattern.
3. **Keep it social:** Engagement in social media is self-evident; build on the strength of this type of software for activities and assessments.
4. **Think differently about learning:** Most mobile devices are equipped with excellent video and audio recording features and one should take advantage of these and other “Apps” to enhance learning.
5. **Reduce typing:** Mobile devices are not particularly good for entering large amounts of text so don’t ask the students to do this.

Using the above principles and recognising that both instructors and institutions were hesitant to move away from paper-based assignments, we decided to design a mobile-enhanced course, rather than a course that expected 100% participation through a mobile device. Although most of the course could be

completed using a mobile device, it was not mandatory. Some aspects of the course remained easier to complete with a more traditional desktop or laptop computer, and students were encouraged to complete tasks using the device that made the most sense. We selected a Continuing Education Department course, Managing the Human Resource Function (MHRF), as the pilot for our new design approach because it offered opportunities for experimentation with mobile fieldwork, the instructor of the course had a keen interest in m-learning, and it was predominantly subscribed to by mature students—our most critical audience. A design team was assembled and consisted of the key stakeholders impacted by the proposed new course: instructional designers, an educational technologist, an information technology manager, the LMS manager, an administrator from the continuing education program, and the course instructor. We refined our research question to examine learner acceptance. If a course was designed to take advantage of m-learning opportunities, would the students find it more effective for their learning? With more and more distance and continuing education programs available for students, adult learners have more choice in course selection. Would an m-learning enhanced course be a more enticing offering for students? In other words, did it make sense to invest in m-learning design from a learner’s perspective?

As this was a fully online course, the base structure of a unit of work was designed according to Clothier’s (2013) first and second principles, as well as cognitivist theory, which reiterates the importance of reducing the cognitive load of new information for students by providing them with a simple interface and data in manageable bites. An HTML based “hide and show” format chunked information into small segments arranged around key concepts and also reduced display clutter (Figure 1).

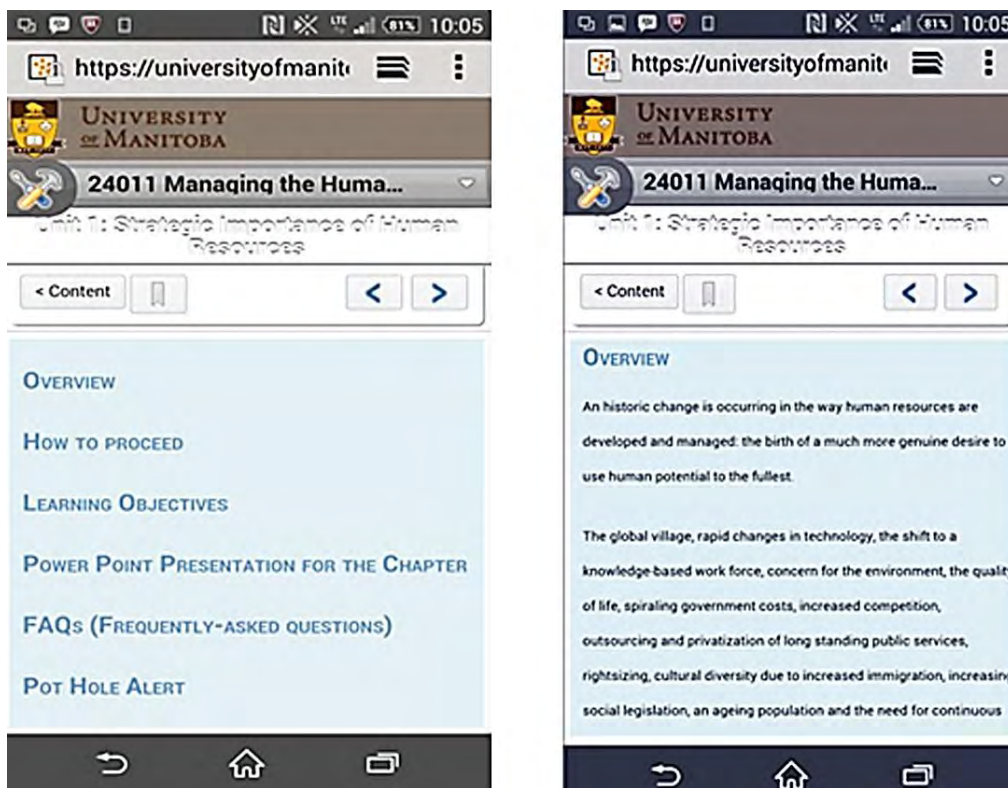


Figure 1. Sample unit of content as it appears to students upon initial access and after the “Hide and Show” feature has been opened.

Using Clothier’s principles 3-5, we also made substantial changes to the design of assessment tasks. We adopted social media by developing a Twitter hashtag for the course (#CEHRM), which was designed to facilitate student connections within the course and help learners to establish links with human resource managers in the broader professional community. The purpose of the Twitter community was to create space for students to share current literature and information related to the course while allowing them to establish a personal learning network that could potentially assist them in the future with the rapidly changing field of human resource management. Tweeting replaced typical face-to-face classroom discussion or online discussion forums, which would have required significantly more keyboard entry.

The two other major assignments attempted to simulate HR field experiences. Building on the strengths of mobile devices for easy video creation, students were required to record themselves as they conducted tasks typical for human resource managers: interviews and training sessions. Students were asked to turn the camera on themselves and post it to a forum where they could receive feedback on the relevancy and quality of their simulated events. The design of these video-based assignments was guided not only by the technical strengths and limitations of the mobile devices, but were also a reflection of Clothier’s (2013) third principle: the use of social media to share and make connections with others on a similar path. In this case, those connections were limited to class members as all video data were held in a semi-private YouTube channel. The goal of the Youtube platform choice was to respect the privacy of the students by allowing them control over what they choose to share publically, while still giving access to class members for peer review purposes.

The course was launched in 2014 with a cohort of six students. Of the six, only two participated in the research interview. Their interviews were transcribed and analyzed for themes alongside the written reflections of the design team and instructor. Four interrelated themes were identified in relation to factors impacting acceptance of m-learning for continuing education courses in our case:

- **Technical and administrative glitches impacted acceptance:** As the course design impacted several departments within one faculty, as well as involved the use of uncommon technology support, new interdepartmental relationships needed to be developed. The process of building these internal processes involved challenges that were recognized as factors impacting the acceptance of the course. For example, who was responsible for technical support for social media? Was it the instructor or the course technical support team, or the educational technologist assigned to the course?
- **Instructions for new technology need to be presented in a “just-in-time” format:** We placed course specific instructional sheets and videos in a central location to facilitate future maintenance of the course, but this lead to frustration as participants searched for items and became frustrated when they were not located immediately next to the assigned task.
- **The time needed to use and learn the technology must equal the task demands:** Learners demonstrated a low tolerance for tasks that appeared too onerous because of technology and

were willing to ignore the task and potentially lose the associated marks if the technology was deemed to detract or make the task more difficult to complete than necessary.

- **Instructor-student relationship was critical to acceptance:** Learners used technology and developed more confidence with technology when the instructor demonstrated skillful use of the technology or was available for immediate feedback when problems arose.

Though the participant numbers were small, and the results may not be applicable outside of the context of our case, the findings were useful for the departments in question and have been used in subsequent course revision and design. The findings revealed that m-learning added greater depth to the assessment activities by allowing participants to personalize the tasks to their own needs and contexts, making the experience more experiential and interdisciplinary; however, the limitations of the devices, or rather participants knowledge of their devices, the LMS, and the supports offered by the university staff required considerable time investment, which potentially explains why much of the work in this area remains at the pilot scale rather than institutional adoption. When analyzed against the aforementioned FRAME model (Koole, 2009), we determined in this case the Device Usability Intersection (D-L) disrupted participants comfort and satisfaction with course materials and assignments to a greater degree than the advantages of portability and the ubiquitous nature of information access. Supporting students in this space required extensive resources and time and when successful lead to increased satisfaction, but the reverse was also true.

Part Three: How Does This Translate to Engagement in Face to Face Activities?

There are a number of points to consider from this online course that have relevance and applicability to the face-to-face, hybrid, and blended courses with regard to scalability and engagement. Following Clothier's design framework for m-learning, we developed a number of suggestions for fostering engagement. These suggestions are supported by analysis of Engeström's (1987) Activity Theory, which defines engagement as a result of competing forces within an activity system consisting of a subject (the individual), the object (the thing that is acted upon), as well as the components (instrument, community, rules, and division of labour).

Reduce clutter and create information bites. Many faculty members use an LMS-based resource to support both in and out of classroom activities. However, in order to increase engagement or use, the LMS needs to be more than a simple repository for lecture notes. We found that PowerPoint presentations displayed well on most mobile devices, although animations were lost. Using simple tools like Camtasia, the slides could easily be converted into interactive lesson reviews through the incorporation of multiple choice questions interspersed throughout the presentation. This same principle could be applied through the addition of Flash Card sets using free online tools such as Quizlet or the quiz tool found within the LMS itself. Doing so would facilitate the drill and practice of common vocabulary and change the passive reading of a PP into an active task. From the perspective of Activity Theory, using the tool in this way shifted the students (subject) contact with the material (object), thereby prolonging engagement beyond the boundaries of the standard contact time through an instrument, which is not atypical for other strategies for homework and review. However, the mobile device can also work to increase engagement by impacting community, rules, and division of labour, and

therefore increase engagement in a less behaviouristic manner. In other words, by capitalising on the ease with which you can create and share content using the mobile device and the level of familiarity most students have with their mobile device educators can apply the principles of social constructivism for content acquisition.

Keep it social and think differently. Allowing students to create content for the course changes the rules and the division of labour found in typical face-to-face classrooms. In the online course previously discussed, the student generated content from the interview and training lessons assignment became important learning material for other students. Much like the cooperative learning approach known as jigsaw where students alternatively take the roles of leaders and learners, the mobile device allowed for course content creation by students in a way that could be saved for future use and reflection.

Alternatively, allowing for more communication through the mobile device could also increase activity. For example, students engage with Twitter in a different way than with discussion forums and encouraging the use of a Twitter feed within contact time could add another dimension of communication to the class. For example, the feed can be displayed on a split screen during a lecture, so students can comment and ask questions as well as share ideas. Alternatively, a theme can be carried beyond the classroom time through prolonged discussions on Twitter. Using free polling tools such as Study Boost or Poll Everywhere can create a similar effect with more scaffolded feedback. You can share the link with students via a QR code (a matrix based bar code) which you have generated using one of the many free sites available on the Internet, or encourage them to access it directly from the LMS and create an interactive quiz on pre-conceptions of a topic. They can also use it to express opinions with real time feedback, again by displaying the results of the poll as you conduct your lesson. The reality show Canadian Idol's popularity demonstrates how much we like to be asked our opinion on content or take control of our own experiences.

Conclusion

In exploring the role of mobile devices in our course design we moved from simply acknowledging and accommodating for the use of these devices to embracing them. Recognising that mobile devices have limitations for some course content is important to consider when evaluating the application of m-learning adoption on a course by course basis. Since many students demand mobile access to content we needed to consider the choice of artifacts carefully: will they work on all devices? How will we advise students who want to use their mobile device? How will we conduct a virtual classroom even if we know some students cannot access all the features? But facilitating mobile access was only the first step. Moving towards course design that not only compensated for the limitations of smaller devices but also capitalized on its advantages was important for us to keep courses relevant to our student population. Designing for m-learning involved careful consideration of the affordances mobile devices bring to the classroom in relation to students, instructor and institutional capabilities. Finally, beyond improving distance courses the next step was to consider the use of mobile devices to hybridize face-to-face classes. Rather than asking students to tune out, or check out at the end of a standard lesson we could develop learning approaches that accord with the way in which students are already working,

perpetually connected. We have shared with you some of our discoveries on our mobile learning journey, and we would welcome your stories from the field as well.

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