

An Analysis of Socio-Technical Factors in Implementing Mobile Learning Solution at an Educational Institution: A Case Study of Mid-Tier MBA College in India

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ABSTRACT

The exponential rise in the adoption of mobile devices around the world opened up unthinkable possibilities in many traditional lines of businesses. Mobile devices have become corner stones to publishing, news media, social media, ecommerce, navigation, location based services, travel companions, tour guides and much more. The consumerization of mobile technology enabled by factors like endless choice of devices, low entry barrier, high usability and disruptive innovations, has also presented mobile learning to the education industry.

Given the rise in the number of educational institutions across India, mobile learning is seen as more of a branding tool and less of a pedagogy or learning innovation tool. Owing to this perspective, the institutions focus on rolling-out an mLearning implementation at the earliest, rather than laying out a long-term strategy towards real innovation.

In this paper, we present some socio-technical issues faced in one such mLearning roll-out in a mid-tier Management Institute in South India. We relate our experiences to existing research, and attempt to provide a direction towards developing an mLearning implementation framework, that could provide a strategic approach to mLearning adoption.

Author Keywords

mLearning, mobile learning, socio-technical limitations, mLearning framework, mLearning Capability Maturity Model

INTRODUCTION

Mobile devices are found in every pocket and embedded most commonly in our lives, reinstating their ubiquitous and ever-connected affordances with the moving world. Given their technological enhancements such as engaging interactions, powered connectivity and processing as good as a PC, connectivity and so on, the combined power of mobile technologies and devices plays a significant role in our lives and if harnessed towards education, the benefits can be multi-fold.

Mobile learning is often defined as learning rendered through mobile devices such as Cellphones, Tablets, MP3 players, PDAs, Play stations and so on. In spite of their portable and pocket-able affordance, if a learner uses them while in static or non-mobile situations, then it would not make sense to claim it mobile learning. It is wise to consider mobility in a much broader context and hence Sharples et al., (2007) classify mobility in terms of physical, technological, conceptual, social and time spaces. These 5 dimensions act as different formal and informal contexts that occur in every individual's life, within which the mobile devices can augment the dynamic learning needs

Sharma and Kitchens (2004) propose that mobile learning offers a blend of e-learning and classroom training through the technological advancements like wireless telephony and wireless computing. Further, they indicate the transition of learning from classroom to computers to mobile devices, which translate into instructor led training to e-learning to mobile learning. Hence, mobile learning seems to broaden the capabilities of e-learning by leveraging the technological advancements that let a learning device stay connected or demonstrate a portable mass storage (Wagner, 2007).

In spite of several studies that demonstrate the potential of mobile learning in education, the implementation phase necessitates to consider various elements of the educational ecosystem, such as pedagogy, technology acceptance, institutional readiness, teachers' competencies. Thus, several researchers (Ismail, 2013 and Sherry & Gibson, 2002) emphasize the need to identify the right elements like technological, social, and institutional factors that determine the success of a mobile learning implementation. To this end, there has been minimal research that help identifies the prospect of mobile learning, salient factors, and challenges on the implementation front of mobile learning. Hence, the current research paper presents a case study of a mid-tier educational institute in India that failed to execute a mobile strategy, and attempts to expose a set of socio-technical factors that are instrumental in rolling out a mobile strategy and as well proposes a potential framework that addresses the issues.

CASE STUDY

Our objective was to implement a customized version of our proprietary mLearning ecosystem / platform along with our own custom-built Android Tablets in a mid-tier Management Institute in South India

Our product was a mobile LMS, Student Information Systems, Attendance tracking, Facebook like social learning platform, Adaptive self-assessment platform, P2P Mindmapping, Course creation / trading platform, eReader, Video conferencing, Location based learning, Augmented Reality learning - all built into one cohesive mLearning platform.

We wanted to enable anytime, anywhere learning. As MBA is a research oriented program, compared to an engineering degree, we wanted to provide social research / collaboration tools, both within the classroom and outside it. Our vision was derived out of Corning's version of a connected classroom in its A Day Made Of Glass 2 video (<http://www.youtube.com/watch?v=jZkHpNnXLB0>)

We envisioned that a professor would start presenting a theory by sharing or streaming (if professor is remote) a slide on the student's tablet. Following which he may initiate case studies, which the students will work on using P2P mindmapping tools. Students will have accessed to open content and curated content. They can publish their findings to the teacher who can collate it into a larger mindmap, which can be shared back with the class. Classroom lectures can be recorded and tied to specific textbooks. Students can use tablets to interact with the textbooks, and invoke classroom replays by touching on specific paras from the book and hovering the tab over it at the same time (augmented reality). Students can follow trending topics from Twitter related to their curriculum, have their own FB like social forum within the campus, etc. They can interact with real world objects and find out how it ties to the concepts they read in the class. For example, they can scan an empty coke can to the augmented reality browser and invoke videos that show how CocaCola's supply chain worked or what management style was followed in that company!

DISCUSSION

In order to turn this vision into a reality, the team of researchers has experienced few practical problems that have impeded the implementation plans leading to the abrupt project suspension. Given the limited scope of this paper, the authors confine to key social and technical factors of the case and evaluate them against the existing literature on mobile learning design and implementation. The subsequent sections uncover the challenge, research underpinning and the possible pedagogical consequences.

Device Diversity

First and foremost, the target devices that were sourced from a vendor suffered from incompatibility because the tablets were of different hardware and software versions. This has badly impacted the application suite and as well caused an unintended BYOD scenario, which will be detailed in the next sub-section.

Drawing on the related literature, this issue highlights the concern of device diversity that isn't yet supported from a pedagogical stand point. In this context, Quinn (2000) asserts that device agnostic delivery of learning content is not being possible because of the device ownership and absence of standardization. Hence, designing learning solutions for a variety of devices will prove challenging to educators as they cannot afford to accommodate generic learning material for all platforms.

Network Constraint

The vision to implement state-of-the-art technology cannot be accomplished without a reliable network technology resource. In this case, the network was lagging, with very limited bandwidth to even run a single classroom. The intention to live-stream a video lecture of a visiting professor from a remote location could never be achieved because of the slow connectivity.

Literature on challenges of mobile learning emphasizes intermittent network as one of the technological limitations. Naismith and Corlett (2006) postulate that mobile devices may become unreliable for a continued or uninterrupted communication due to poor network capabilities and result in a poor synchronous learning experience among students.

Financial Affordability

The next vital factor is about the financial affordability of devices because Ed Leadership preferred to start with an iPad based program, but later opted to go with Android due to 2 reasons: cost and customization capabilities. iPad was way too expensive for the Indian student market even with Apple's discount.

This reflects with Osang et al (2013) who emphasize that high infrastructure costs determine the preference of mobile learning over other mediums and a compromise might not justify the plan. Extending the thought about diversity and incompatibility between platforms, Apple iPad's closed ecosystem did not allow for customized boot-up screen, and custom apps that can be installed outside iTunes store. Thus, the lack of interoperable condition may not accommodate seamless integration between diverse learning applications, ultimately enforcing a compromised learning strategy.

Student Distraction

One of the socio-psychological reasons that hindered the process is distraction, which has been quoted as a major concern in mobile learning studies because of low-attention levels on the move. In the context of the current case study, besides bringing in their own devices (BYOD), students were given an uncontrolled access to web as there was no fair usage policy. As a consequence, many students used classroom hours to download games, videos or even full length movies on to their tablets paving way for misuse and distraction.

In support of this, research studies (Osang et al., 2013 and Mohamad et al, 2012) and have clearly indicated about distraction where students are often found to be social networking, listening to music, and other online activities during their productive learning time.

Faculty Resistance

The next major obstacle was from faculty, technical support teams, and other stake holders who were resistant to transit from traditional classroom teaching to a mobile blended approach. The resistance derived from a variety of factors like job insecurity, attitudinal issues, Non-acceptance of technology and so on, which did not co-operate to commission the implementation of mobile learning. Further, the faculty was not ready enough to upgrade their technical skills and lacked hands on experience of integrating mobile devices in their learning plans.

In this context, Perry (2003) suggests that a collaborative effort from educators, technologists and management is quintessential to identify learning opportunities and integrate mobile medium seamlessly. This is clearly missing among the related stakeholders, which impeded the progress of the project.

Siloed Pedagogy

The resistance and incompetency from various angles could not capitalize the potential in the right direction and further paved way to a poor pedagogical implication like Siloed content design without a common ground among the lecturers. That is, every faculty chose what is best for them, and did not bother to share it across the shared database. The broad set of topics were decided and agreed upon, but the content used inside classroom was mostly not shared with other faculty.

This is strongly reflective with UNESCO's (2013) research that proclaims that without guidance and training, teachers will often use the new technology in the old molds, that is to 'do old things in new ways' rather than revising the teaching practices. Since most faculty were not accepting of mobile learning roll-out, researchers could not make headway into guiding them on mobile learning content design.

CONCLUSIONS

An mLearning implementation is similar to a technology roll-out in any business organization. And such a technology roll-out is usually guided by a capability maturity model. Applying that to this case study, the socio-technical limitations identified here could indicate that the educational institution was operating at a lower capability maturity level, where some of its business processes and resources were not clearly identified, defined or optimized. On the other hand, business requirements should be clearly identified before they could be supplemented or augmented by a technological solution. A capability maturity assessment and maturity building exercise should then have preceeded the complex technology implementation.

Hence, this implementation could be approached using a techno-pedagogical capability maturity model, like the Capability Maturity Model Integration (CMMI) used in an IT organization. But the currently available maturity models for education institutions do not address the mLearning phenomenon that has risen in the recent years. Juilan M. Bass's ICT Maturity Model for Education Institutions comes close, but stops at addressing only the traditional ICT or PC-based learning. (http://www.sed.manchester.ac.uk/idpm/research/publications/wp/di/documents/di_wp44.pdf) However mLearning brings a paradigm shift compared to traditional ICT given the mobility factor, and hence requires a dedicated mLearning capability maturity model to address this gap.

Based on this case study, an mLearning capability maturity model if evolved, would then have to help identify the various stakeholders and resources for an mLearning implementation, the associated business processes and assess the capability maturity level of the institution prior to an mLearning implementation. Additionally, an mLearning capability maturity model would also have to address network capacity planning, mLearning experience design, content and curriculum design, business process design, knowledge management, vendor management and stakeholder expectation management.

With this as a starting point, the researchers propose to pursue the development of an mLearning Capability Maturity Model, deriving its principles from similar existing capability maturity models developed for educational institutions and other domains.

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