AN INTERACTIVE MOBILE LEARNING SYSTEM FOR ENHANCING LEARNING IN HIGHER EDUCATION

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ABSTRACT

Most higher education in South Africa adopt English language as a medium of instruction, which made it difficult for students who speak and write English as a second or third language to cope with the face-to-face lectures. Face-to-face lectures lack persistence and when students fail to understand the lectures during the once off face-to-face sessions, there is no opportunity to playback the lecture. Recording lectures with Opencast Matterhorn and making these available to these students as a supplementary resource to the face-to-face lecture has potential to alleviate this problem. Accessing the Video or Audio of opencast recorded lectures (ORL) on students' mobile devices anywhere and at any time after face-to-face lecture could enhance student understanding of lectures and improve learning. This paper describes the architecture and design of an Interactive Opencast Mobile learning that enhances learning in higher education.

KEYWORDS

Opencast, Mobile learning, Mobile devices, Video, Audio, Face to Face Lecture

1. INTRODUCTION

With the tremendous growth and advancements in mobile and wireless technologies such as Smart Phones, iPads, Tablets, Wi-Fi, GPS, 3G; mobile learning has come into focus (Woukeu et al 2005). This proposed Interactive Opencast mobile learning has the potential of activating an educational shift from a formal, classroom-based and teacher-centred approach towards an informal, interactive and learner-centred approach where learning happens anywhere and at anytime.

We propose an Interactive Opencast Mobile Learning Framework (OMLF) where students of University of Cape Town (UCT), South Africa, that have difficulty coping with the face-to-face lectures can watch or download opencast recorded lectures (ORL) to their mobile devices while on campus where they have free access to Internet and learn while on the move. We have been able to develop a mobile application (figure 3) where students can view their recorded lectures on their mobile devices at anywhere and anytime. The short coming of this system is that students cannot post a comment on the ORL as they watch it, there is need to navigate to another page, which disrupts the interaction with the ORL. The ORL also cannot be downloaded.

In this proposed interactive mobile learning (figure 2), students can watch the video or listen to the audio of the ORL and also download it. The comments can be posted while watching the video. The strength of interaction in this system lies in the collaboration between students and students, students and lectures. The students post comments after watching the ORL; these comments help weak students to understand the lectures. This form of interaction is beneficial to students having limited access to the lecturer after the face-to-face lecture. The ability to see the comments of other students on the ORL in different official languages of South Africa i.e Afrikaans, Zulu, and Xhosa will also enhance student learning.

2. OPENCAST MATTERHORN

Opencast Matterhorn is a free, open-source, platform for supporting the management of educational audio and video content and has the affordance to improve the efficiency and production of recorded lectures than

traditional podcasting. Most institutions of higher education produce a huge number of lecture recordings which are stored in an archive; opencast allows access to this storage when needed. Podcast works with a variety of tools and programs to produce and distribute content while Opencast Matterhorn offers all the relevant functionalities as an integrated whole. This reduces the amount of manual work needed to shepherd media objects across various sub-systems, thus increasing productivity and reliability (Ketterl et al 2010). Opencast Matterhorn also provides the educational community with a rich media platform for educational research, both technological and pedagogical. Higher education students can be reached in more ways, through plugging into the right learning context (e.g. LMS), or access through mobile devices hence increasing interaction, universal access and improved discoverability.

Opencast Matterhorn aims to make lecture capture affordable for institutions whether an institution is just starting an academic podcasting program, or wanting to integrate with existing infrastructure for those institution who have already invested in a lecture recording program. Opencast Matterhorn includes the following features[1] (Ketterl etal, 2010):

• Administrative tools: tools for scheduling automated recordings, manually uploading files, and managing metadata, captioning and processing functions

• Integration with recording devices in the classroom for managing automated capture

• Processing and encoding service: services that prepare and package the media files according to configurable specifications

• Distribution: local streaming and download servers and configuration capability for distribution to channels such as YouTube, iTunes or a campus course or content management system. The feed distribution channel provides an easy endpoint for integration with any third party system wanting to connect to Matterhorn. The implementation of the service is straight forward, copying the distribution media files to local download and/or streaming servers and creating an rss and/or atom feed out of the static metadata of the media package

• Rich media user interface for learners to engage with content, including slide preview, content-based search and captioning

3. MOBILE LEARNING

Mobile Learning (M-learning) also called nomadic learning has influenced and enhances the benefit of e-learning, accessing learning contents and making available personalized learning anywhere and anytime (Ketterl et al 2006).

Many definitions of M-learning exist in literature. Geddes (2004) defines mobile learning as 'the acquisition of any knowledge and skill through using mobile technology, anywhere, anytime that results in an alteration in behavior'. Some other authors (Quinn, 2000; Keegan, 2002) place more emphasis on the mobile devices and the mobility of the user. These authors viewed m-learning as occurring in informal learning settings.

4. DESIGN OF AN INTERACTIVE MOBILE OPENCAST

There is need to capture and record lectures using Opencast for continuity and persistence outside the traditional classroom which lack persistency. Opencast Matterhorn provides a way of automatically capturing and recording lectures in higher education hence making lectures persistent. Pilots are currently being run at the Faculty of Health Sciences, University of Cape Town. Our view is that when students download (ORL) to their mobile devices, the pedagogical potential of Opencast Matterhorn would be realised as most students own mobile devices.

Apart from students having difficulties in face-to-face lectures due to language barrier, there is need for part-time students who are always on the move to have a mobile version of the Opencast; examples of such students are mothers having to wait in the doctor's waiting room for hours and students working as salesmen

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[1]www.opencastproject.org

spending a lot of time driving from one customer to another either on train, bus or in their own car (Becking *et al* (2004)).

We have built an Opencast mobile application (figure3) which can be viewed on mobile devices by students. Students can watch and listen to the ORL on their mobile devices. For students that are shy to ask questions during the face-to-face lectures (Lee et al 2007), this mobile Opencast encourages participation and collaboration among students using blogs. The major short coming of this application is the inflexibility of the interactive mode. Students have to navigate to another page to post the comments after watching the ORL and cannot download the ORL. We are proposing an interactive opencast mobile learning, an improvement on this existing application. In this design (figure 2) the students can post their comments while watching the video in different languages. There is also a download option. Figure 1 describes the architecture of the interactive opencast mobile learning. In this architecture:

- Mobile devices provide interfacing to the application.
- Host web site provides the fields to access data (ORL) for the application on the mobile device.
- Administrator authorizes the upload and download of ORL from the host site.
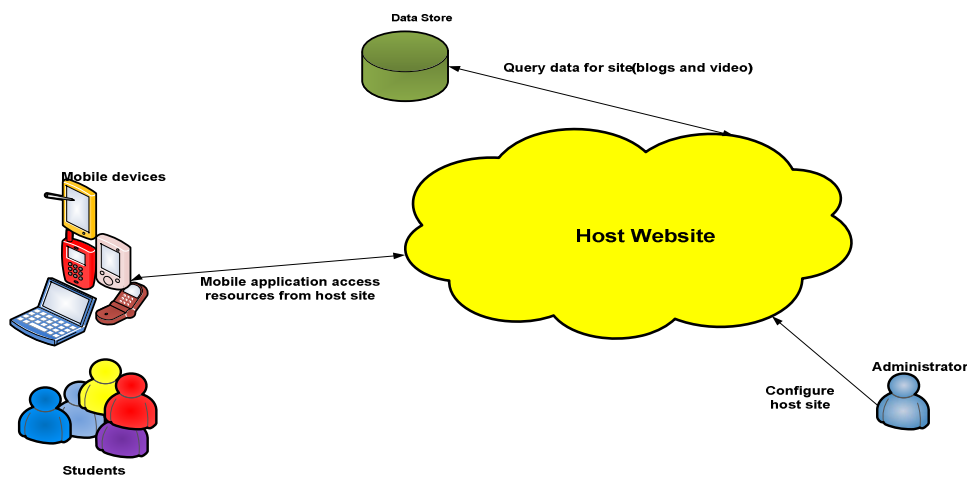

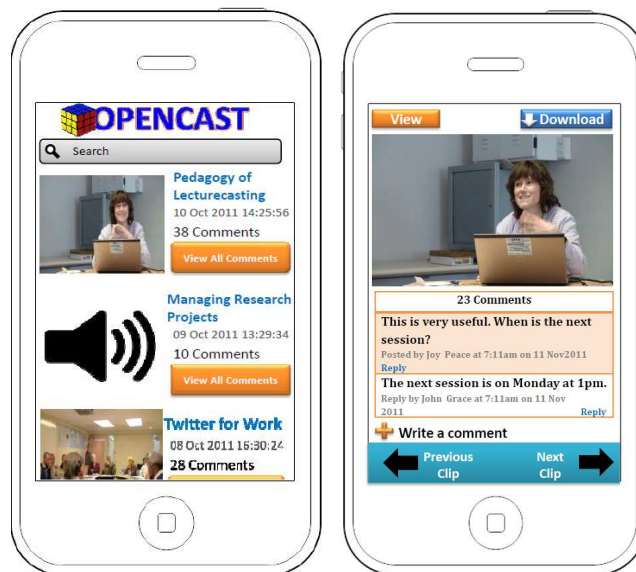Figure 1. Architecture of an Interactive Opencast Mobile Learning

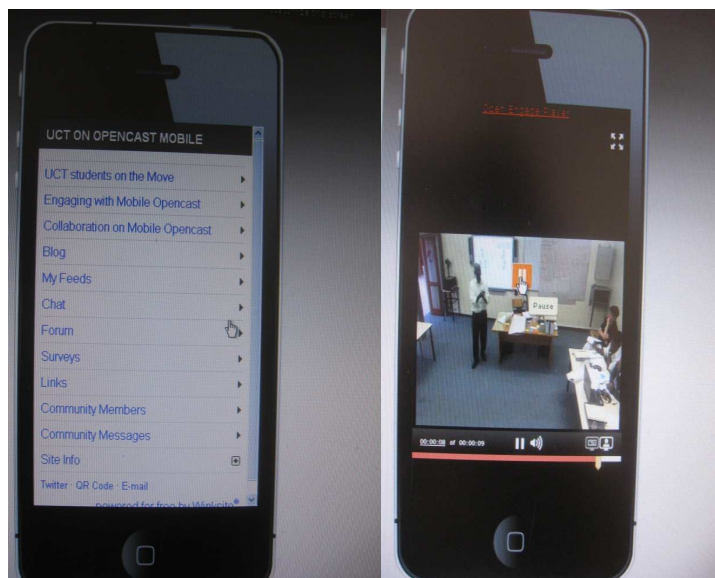Figure 2. Prototype design of the Interactive Mobile Opencast

Figure 3. A Mobile User interface to Opencast

5. CONCLUSION

This interactive Opencast Mobile learning seeks to enhance learning in higher education. In this work we have been able to improve on our existing mobile opencast application that supplements the face-to-face lectures. This application will run on different mobile devices of student and allow collaboration between students that are good and weak in understanding English language. Students will also have seamless access to recorded lectures anywhere and anytime on their mobile devices to watch at their convenience. This mobile application supplements the traditional face-to-face lecture and not substitutes it. The next phase of this work is to implement and evaluate this application at University of Cape Town (UCT), South Africa.

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