PRAGMATIC PODCASTING: FACILITATING PODCASTING IN DEVELOPING HEIs

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ABSTRACT

MLCAT is a desktop content authoring application that is used to record lectures and presentations for educational purposes. It does not only record the audio of the speaker but also their Power Point presentation. It is able to record, encode and save the presentation in various formats. The result is one synchronized multimedia video that can be played back on a variety of feature phones. Apple has a big success with the release of podcasting solutions, iPod series and accessories. They enable the user to carry around music and videos, play them back while on a bus or even use it as a digital multimedia library. These products have been trialled and used in Higher Education Institutions (HEIs) in the developed world. Developing world HEIs such as those in Africa have limited diffusion of these technologies due to their relative high cost; infrastructural limitations, technical skills shortages; digital divides and cultural and socio-economic issues. This paper describes a pragmatic podcasting approach and how instructors can author and supply the learner with mobile-ready lecture recordings in order to enable mobile learning "anytime – anywhere". Our solution has been implemented and is being made available for lecturers and students to examine and evaluate. The feedback will be analyzed and enhancements to the system proposed.

KEYWORDS

E-Learning, Podcasting, M-Learning, HEIs, Mobile Education.

1. INTRODUCTION

The growth of podcasting since its incarnation in 2004 has been phenomenal and has become an innovative way of broadcasting information on a range of subjects, from news-based items to comedy sketches (Dale, 2007). Within an educational context, podcasting offers innovative and creative opportunities for academics to further support learning. Podcasting refers to *"a form of mobile learning in which audio or video content, available on the internet or some server can be downloaded onto a computer then transferred to mobile devices for consumption"* (Evans, 2008). The other variant i.e. video podcast is a term used for the online delivery of video on demand via Atom or real simple syndication (RSS) enclosures facilitating the automatic download of new content as it becomes available.

From a web server, a video podcast can be distributed as a file or as a stream. This subscription model is ideal in Western HEIs with fast and reliable internet connections. Therefore, in developing HEIs, the emphasis is on the authoring and end user access with no stress on subscription models as put forward by other researchers (Malan, 2007 & Lee et al., 2009).

Ultimately, access to the video podcasts in advance gives the user the ability to play the video podcasts off-line and on a number of devices, particularly cell phones – mainly prevalent in developing HEIs (ITU, 2011). In addition, podcasts can be watched many times and shared amongst different users reducing bandwidth costs. Developing, publishing and integrating podcasts in teaching practice does not necessarily have to be exhaustive, complex, require expensive software or highly skilled and advanced system users. Therefore, this paper focuses on the emerging requirement of empowering instructors to author mobile content for educational purposes in developing HEIs. We introduce our novel approach of Pragmatic Podcasting - a fully automated generation of video podcasts through an exploration and transformation of authentically recorded lectures and presentations into mobile multimedia learning objects of high quality. These learning objects can be played back on cell phones in order for the learner to access nearly everywhere and off-line. The remainder of this paper is organized as follows; we start in section two with related work, an overview of pragmatic podcasting in section three; describe some preliminary deployment results in section four; and finally conclusions and future work in section five.

2. RELATED WORK

Mugwanya & Marsden (2010) reveal that majority of tools published for authoring mobile educational content report on their use in developed HEIs. These tools may not be easily adapted to developing HEIs due to the varying social, economic and cultural environments. This is evident from the low adoption of some e-learning tools such as Blackboard and WebCT in various African HEIs. In addition, there are limited uses of podcasting within developing HEIs with a few undertaken by enthusiastic faculty. Typically, faculty do not use any standard architecture or model for podcasting but instead have their own piecemeal improvisations e.g. the use of Podcast Producer Server at the University of Cape Town on a trial basis, OpenEyA (http://www.openeya.org/), Tele-task (Wolf et al., 2007) and Adobe tools. These tools are normally costly, general purpose and not developed within developing (ICT4D) contexts. As a result, they do not necessarily adequately address users' needs; are often complex and difficult to use.

In other works, Ketterl et al. (2006) describe the use of VirtPresenter - a PowerPoint based lecture recording system currently integrated into Stud.IP - a Learning Management System. It creates web enabled presentations for further adaptation to mobile devices. Gannod et al. (2008) report on the use of Profcast for capturing Microsoft Power Point and Apple Keynote presentations with voiceovers; Snapz for capturing full motion presentations of software use (e.g. a screen cast); iMovie for capturing full motion talking head lectures; iWeb for deploying the podcasts onto a standard web server and Black Board for storage, grade book and assessment management. Many of the applications use a variety of applications to deliver the end product and require accessibility to computers or high-end mobile devices whose ownership is limited in the developing world. The implementations described are problematic and are not sustainable since tooling may require that

lecture theatres have integrated infrastructure common in developed HEIs. To the best of our knowledge, despite the reported successes for many of the tools presented above, there is a gap in the literature on designing podcasting systems for developing HEIs. Moreover, utilizing tools such as mobile devices already in the possession of students and relieving the pressure on HEI infrastructure through the use of a simple, easy to use desktop application may save academics valuable time, effort and resources. Hence, we present our pragmatic podcasting approach that is being trialled at developing HEIs. We begin by describing the approach and then provide some preliminary deployment findings.

3. PRAGMATIC PODCASTING

Producing and publishing a podcast oftentimes involves a series of people and/or technical skills to operate a video camera (in case of video podcasts – "vodcasts"), to record sound, to edit recorded material, to encode material to a podcast format, to develop XML feeds, and to publish material on a web server. Only a very limited amount of instructors have all these technical skills and access to the required equipment, and thus this way of podcasting may be unrealistic, too time-consuming, or too expensive. Therefore, our pragmatic approach offers support for instructors and students to develop podcasts themselves using easy-to-use authoring and access tools respectively. The sections that follow describe our podcasting approach, exemplify how a podcast can be authored using a simple low-tech setup, and discuss its integration in teaching practice.

3.1 Technical Setup

The setup of our podcasting system has three components i.e. the authoring component, hosting component (the Snap&Grab system (Maunder et al., 2008) and a LMS) and access component (using feature phones and laptop/desktop computers). Figure 1 below illustrates the architectural setup.
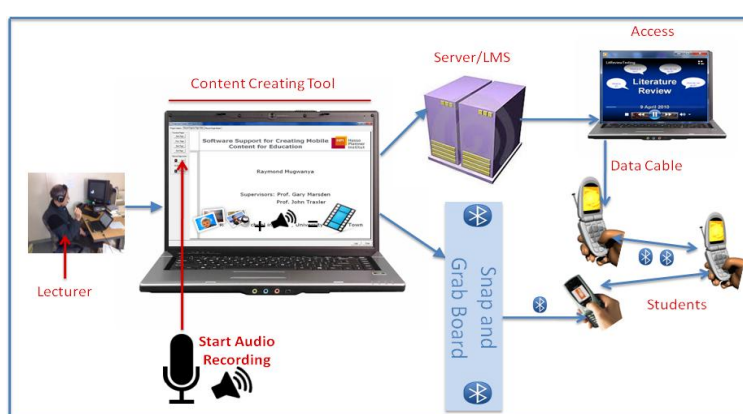

Figure 1. MLCAT Setup

The setup is based on a system developed using the .NET environment as it offers the ability to develop extensions or add-ins for Microsoft Office applications.

In particular, we design interface ribbons onto which click events are developed to offer varying functionality such as recording, encoding, previewing, pausing and saving recordings in different formats. The back-end systems that host the recordings are a LMS and the Snap&Grab system. Users can access podcasts using the network provided on campus via the LMS or through Bluetooth via the Snap&Grab system.

3.2 Authoring

In our pragmatic approach, the authoring of the podcasts is done by the instructors themselves using MLCAT interface and a headset. The authoring takes its starting point in the material of an existing presentation or lecture. Most instructors prepare digital slideshows like PowerPoint presentations as an integral part of their lectures. MLCAT allows the instructor to record and pause audio, navigate the presentation and later on encode the presentation and audio into a high quality video in a variety of formats i.e. MPEG-4, AVI, MPEG and 3GPP.

3.3 Publishing

Once the podcasts have been created, they may be uploaded to the Snap&Grab system and a Learning Management system (see figure 1). The LMS is accessible to both students and lecturers through the HEIs network. The Snap&Grab system consists of four basic components namely; a large situated display, Bluetooth access point, server machine and the client device (a Bluetooth enabled camera-phone). The Snap&Grab system allows a user to select and download media packages in our case lecture recordings (a collection of various OBEX items) by photographing a visual download key (an image on the display which we replaced with A4 size paper posters) and sending that photo to the Snap&Grab system via Bluetooth. The submitted photo is then processed and compared to the key images currently on display. If a match is detected the media package (or lecture recordings) associated with key image is sent back to the user's device.

4. PILOT DEPLOYMENT AT TSIBA

4.1 System Deployment

In order to deploy the system at TSiBA (http://www.tsiba.org.za/), we were in close contact with a technology champion – The Executive Director who introduced us to three lecturers willing to take part in our trial. The three lecturers teach undergraduate courses in business namely; Strategic management, a foundations course in economics and applied financial management. At this point our goal was not to impose on them how we wanted our tool to be used but to find out interesting ways in which they would appropriate it and later on identify opportunities for further design. Informal Interactions with the lectures provided rich qualitative data revealing interesting results as described under four key themes below. Our assumption was that lecturers would record entire lectures as the MLCAT requirements arose from the unsuccessful adoption of Podcast Producer, OpenEyA and the use of pre-installed recording software on the Mac books and Windows machines i.e. (iMovie), Windows Moviemaker respectively. Participants were trained on how to use the MLCAT system (using the researcher's laptop) after which they were given an opportunity

to make test recordings. Two of the participants had their own laptops onto which the system was installed whereas the other utilized a computer in the library currently used by a part-time student librarian. This computer required the researcher to have administrative rights (in order to install software); housed some of the librarian's applications and thus had reservations about installation of additional software. We then resorted to installing the application on a laptop that was provided by the systems administrator at TSiBA. The results from the informal qualitative interviews are as summarized under the following four themes:

Themes	Notes
Do recording when it suits me/in my free time	*"[...] it would be useful to install on my work computer so that when there are no people around, I can try to get this thing going but to make this thing happen, I would have to find a place that is quiet or to use this [...]"*
Breaking down content into smaller chunks	*"[...] identify hypothetically 50 key lessons for the course. These lessons also appear in the course text books and other resources and create say 50 clips of the same material for students to reference [....]"*
Integrating assembling content into the application ecology	*"[…] in finance, we use Excel quite a lot...we can have it in excel and paste it into Power Point. Easier to use excel because i can change numbers i.e. what happens if the profit in year 2 was not 300 but 400? How does it affect our average, standard deviation, coefficient of returns? How will the analyst/ Investor perceive this investment? [...] one can achieve that by replicating this in Power Point [….]"*
Privacy	*"[…] I do not want them to see me in the recording […]"* thus validating our initial assumption that recoding the presenter may not be necessary

Student Survey Summary

The survey sample was self selecting as we focused on students who were undertaking courses taught by our participants. The purpose of this informal survey was to get an idea of who the students were, the devices they interact with, their knowledge of digital lectures and any challenges they currently face. As a result, we interviewed 26 students who were undertaking the foundation economics course with no incentive for participation. A snapshot of the questions asked and responses are presented below.

What technologies do you own?	Flash drives, a few Personal computers, two with no technology at all and the 22 owning a cell phone as their only technological device.
Which Cell Phone Brands do you own?	Nokia Express music 53C, Nokia C3, black berry curve 2GB, Sony Eriksson 4GB, nokia Music express 5130C, Samsung star, Samsung E250, Samsung B3210, E250i, Vodafone 543, BlackBerry curve 8520 4GB, Sony Ericsson W 395, Nokia 5230.
Which technology do you use at Home?	The most dominant technology used at home is the cell phone which validates the existence of a high mobile phone penetration in the developing world. Some instances of usage of Television, Digital Video Disk (DVD) and personal computers were reported to be used at home.
How do you access digital lectures?	A personal computer at School (through download from Moodle - LMS), School network, Khan Academy (http://www.khanacademy.org/), Cami Maths (http://www.camiweb.com/), Internet/online, Maths lessons Online, You Tube, personal computer and download it to external hard drive.
What are the Challenges during access?	*"[...] takes long to respond, internet is offline, slow network sometimes, cannot ask questions directly, slow internet, scarcity of personal computers, do not have a personal computer, mobile cannot read office documents, Difficult to download work and software on campus and home is not the same [....]"*
How would you like podcast lectures presented/delivered to you?	Visual, video, via cell phone, Bluetooth – for sharing, audio and slide shows, available anytime you logon, sms, e-mail, Phone or any other way possible other than MXit (http://mxit.com/), Face book because I would rarely do anything, via Bluetooth every after lecture. Fun and not long, clear and straight to the point e.g. You Tube videos.
What is your understanding of digital lectures?	- Lectures that take place on a PC like Khan Academy - Lectures we have using computers and projectors - Being lectured in the video way – using You Tube and Khan Academy

5. CONCLUSION AND FUTURE WORK

Our preliminary experiences with podcasting show that it is feasible and fruitful to employ a pragmatic approach to podcasting at a developing HEI. Using easy-to-use software tools for authoring, it is possible for instructors to develop podcasts themselves. The approach is not geared to develop "professionally" produced recordings, but rather short presentation and video podcasts. In this paper, we have introduced our pragmatic approach, detailed how lecturers would appropriate it. Our initial assumption that the system was directed towards lengthy recorded lectures was quashed. Instead, there is a potential for short videos – such as demonstrations, summaries of course sections, presentations, model descriptions, solutions to frequently asked questions and topics that call for visual representation.

The pedagogical idea behind short introductory videos is to provide them as resources for students' problem-oriented work and revision. The short introductory videos are in many cases easy to author using our pragmatic solution. The technical solution, both with regards to authoring tools, LMS and situated display – is in every way cheap and easy to administer and support. The described solution meets many of the podcast needs of the HEIs despite there being room for refinements. Future work will explore extended user evaluations and prototype improvements.

6. ACKNOWLEDGEMENT

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