EdTech *notes*

Pedagogical Podcasting
for **Learning**

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Introduction

Podcasting originated as a technology to create and distribute personal "radio shows" via the internet. It is now becoming a technology used to support learning in many educational contexts, at least in more economically developed countries. A 2008 survey of learning technologies used in higher education institutions in the UK (Browne *et al*. 2008) showed that podcasting is a tool that has "increased significantly in prominence" in UK universities (p. 2). Increasing numbers of research papers published on podcasting indicate a growing interest from teachers, technologists and researchers in this field.

Long before the invention of podcasting and its subsequent rise to popularity, educational benefits of audio presentation were identified in podcasting's predecessors: radio, audio-cassettes and audio-vision. The content medium of most podcasting is recorded audio, which is not new in education. Durbridge (1984) at the Open University in the UK claimed that audio can influence cognition through clarity of instruction, conveying immediacy and encouraging a sense of connection between students and their teachers. Wood and Keeler (2001) reported that embedding short audio files recorded by tutors into emails helped to increase student participation in group activities, added a sense of online community and increased satisfaction with the overall learning experience. Re-incarnation of recorded audio as podcasts has made inroads into not only distance learning but also campus-based teaching and learning.

Social and technological changes have increased the uptake of podcasting in formal learning contexts. Software for creating and distributing podcasts, and technical instructions on the use of such software and tools are freely available on the internet, making podcasting a "low threshold technology" (Ramsden, 2007). Significant numbers of students taking university courses own one or more devices capable of playing podcasts - varieties of digital devices that can playback music files as well as sound player software available on laptop computers and mobile phones.

Pedagogical Podcasts

In an early book on podcasting (Salmon & Edirisingha, 2008) we considered podcasts and podcasting as new practices that were still evolving. However, the technologies, tools and devices for creating, distributing and accessing podcasts have developed since then, and we cannot say that podcasts are a new form of technology anymore.

We consider (Salmon & Edirisingha, 2008) podcasts:

- as digital media files that plays sound, or sound and vision
- are made available from a website
- can be opened and/or downloaded and played on a computer
- are downloaded from a website to be played on a portable digital player (such as a mobile phone or a dedicated player, such as an iPod or other brand of portable MP3 player).

A pedagogical podcast is a media file that has been developed based on some kind of a pedagogical design, i.e., with an aim to achieve one or more learning objectives. We return to this learning design approach later in this *EdTech Note*.

Technically speaking, what distinguishes podcasts from other digital media is that the technology that underpins podcasts enables digital media files to be delivered over the internet using syndication feeds. These feeds download podcasts automatically through a subscription service, to be played back in due time on a dedicated digital media player or a computer. The content is "automatically delivered to [a user's] computer as soon as 'new content' is posted on the web" (BBC, 2005). Such a subscription-based access makes podcasts 'a pull' technology rather than a 'push' technology (automated) because the user does not have to seek and download new content manually (Campbell, 2005). While these technical approaches are helpful for delivering and accessing podcasts, we should try to follow

approaches that are easier for the majority of teachers to use. We can make use of podcasting technology without the use of an automated distribution and access approach. Instead we can make podcasts and deliver them to our learners though a variety of available means, for example, by uploading to a Virtual Learning Environment (VLE), other forms of websites, email, memory sticks, and CD-ROMs. Our focus here is the creation of podcasts using a sound learning design approach.

Experience of the Use of Podcasts in Education

The literature on podcasting demonstrates a wide variety of uses for podcasts in higher education as well as in other sectors of education. Geoghegan and Klass (2005) offered valuable advice on locating and downloading podcasts as well as "the secrets of creating podcasts", including steps involved in recording, editing, encoding, and uploading podcasts to websites. Shamburg's book (2009) entitled *Student-Powered Podcasting* is a practical guide for school teachers which argue for students' active involvement in the planning and creation of podcasts. "Student-powered podcasting" is presented as an under explored genre of podcasting, an ideal approach to cultivate "powerful ideas" and taking students further down the road to 21st century literacy. The emphasis is on what students can potentially *learn* using podcasting technology as creators rather than as passive consumers of podcasts created by their teachers. This echoes Steventon's (2012) ideas of an important distinction between 'production', where students become creators of teaching and learning material, and 'consumption' where they are simply the passive recipients of it. Sfard (1998) and Collis and Moonen (2002) refer to 'contribution-oriented' and 'participation-oriented' activities. The former has the greatest scope for embedding students in their learning through the generation of ideas and content. Podcasting has the potential for both.

The educational benefits of podcasting have been demonstrated in many discipline areas of higher education. Pegrum, Bartle and Longnecker (2014), for example, examined whether podcasting can be used to promote deep approach to learning that result in active understanding of meaning and better learning outcomes. First-year chemistry undergraduate students were engaged in 'collaboration, contextualisation of content, and communication through new media, especially creative podcasting'. The researchers concluded that "under some circumstances creative podcasting may … help to promote a deep learning approach" (p. 1).

A second relevant example of the use of podcasts in university level education is that of Popova, Kirschner and Joiner (2014) who examined how students' learning can be supported through 'primer podcasts' – i.e., podcasts that can help students to prepare for their forthcoming lectures. Their findings show that "audio advance organisers and questions experienced by students have a positive influence on learning, because they help students bridge the conceptual distance between new and prior knowledge, better understand the topics in the lectures and stimulate thinking more deeply about the lecture's content and the possible applications of the subject of the lecture" (p. 330).

A third relevant research project on podcasting is one carried out by Kay and Kletskinilona (2012) who examined the use of 'Problem-based video podcasts' in teaching mathematics in higher education. These podcasts offered "short, web-based, audio-visual explanations of how to solve specific procedural problems" (p. 619). The researchers created problem based video podcasts covering five key areas of mathematics as self-study tools and involved 288 university students to acquire pre-calculus skills over a three week period. The results indicated that "a majority of students used the video podcasts frequently, rated them as useful or very useful, viewed them as easy to use, effective learning tools, and reported significant knowledge gains in pre-calculus concepts" (p. 619).

Studies on podcasting have been conducted in other areas of education too. For example, Tam (2012) reported the effectiveness of using podcasts for teaching music and visual arts in a teacher-education institution. Using a survey methodology with 128 students (Year 1 – Year 4) and focus groups with 24 students, the author found that the podcasts have been a useful technology that can supplement face-to- face teaching. Students preferred the podcasts that have been used for demonstrating procedures to those used to deliver lectures.

These studies and a majority of reports in the literature on podcasting in education show positive benefits for learning, derived from the use of podcasts. In surveys and interviews, students

have reported that they value the flexibility offered by podcasts as well as the cognitive and motivational benefits obtained from listening to them.

Incorporating Podcasts into Teaching and Learning Activities

While the literature offers teachers plenty of examples of podcasting for teaching and learning, they may benefit further from having a conceptual framework of how podcasts can be integrated into the broader context of teaching, learning and assessment. Here we provide an overarching framework to aid teachers and learning support staff in considering how podcasting can be adapted to their own teaching and learning context, and in developing their own podcasts to improve practice within that context.

Figure 1 illustrates our podcasting framework. It consists of a core and a periphery, showing teaching, learning and assessment activities. The framework's core consists of the most common higher education teaching and learning activities, such as lectures, seminars, workshops, lab-work, field-work, working with the aid of a computer,

student presentations and assessments. More could be added depending on the particular teaching and learning context and the activities that the teacher and students engage in. At the periphery are specific issues related to student learning in higher education. Within this framework, we (www.impala.ac.uk) provide some examples of how podcasts have been used, both to support core teaching and learning activities and to address issues related to student learning.

The podcasting approaches reported here were generated through a research and development project called IMPALA (Informal Mobile Podcasting And Learning Adaptation, www.impala.ac.uk) at the University of Leicester. IMPALA examined how podcasts can bring the advantages of digital audio (both tutor- and student-generated) to facilitate learning in higher education. The research was carried out in five UK universities (Leicester, Nottingham, Kingston, Gloucestershire and Royal Veterinary College) across a range of disciplines: Chemistry, Engineering, English Language, Human Geography, Physical Geography, Genetics, Media and Communication, Physics, Sociology and Veterinary Sciences. IMPALA had its associate projects in Scotland (The University of Edinburgh), South Africa (The University of Cape Town); and Australia (Charles Sturt University and University of New England).
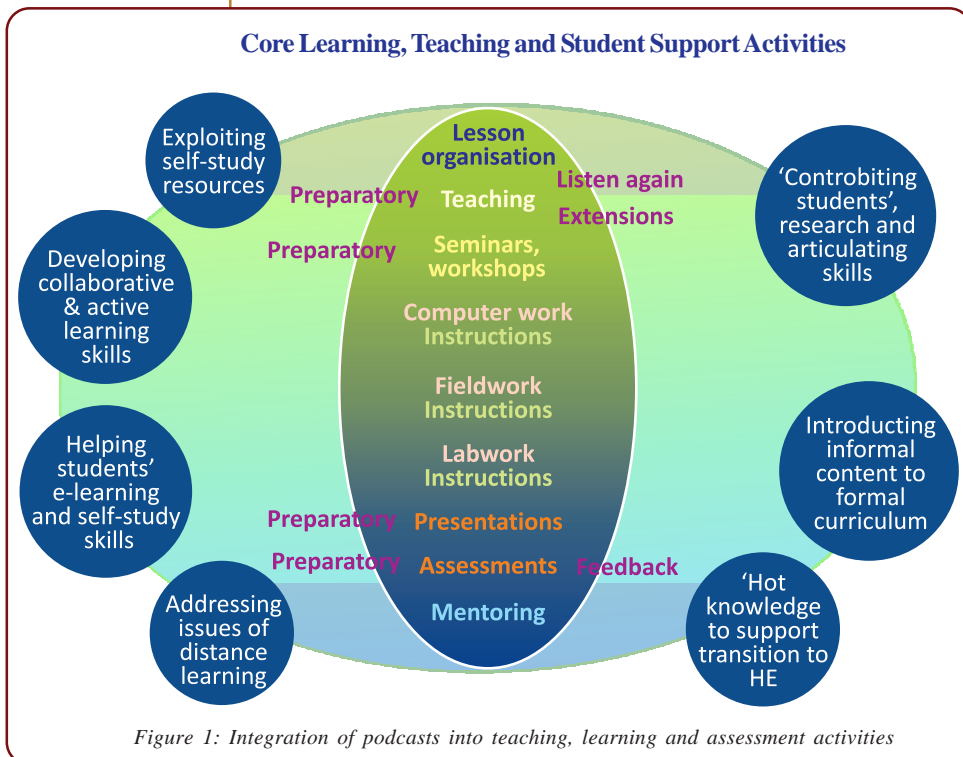

Figure 1: Integration of podcasts into teaching, learning and assessment activities

Designing Pedagogical Podcasts

Here we propose an 8-step framework for designing pedagogical podcasts (Fig. 2, adapted from Salmon and Edirisingha, 2008). Our focus here is the design and creation of audio podcasts.

Step 1: Pedagogical rationale

It is important to make the decision to use podcasts in teaching based on a sound rationale, i.e., a teaching and learning problem, a challenge or an issue that you have identified. Students will not be interested your podcasts if they can't see the point of listening to them. Podcasts need to be linked to

your teaching and learning activities. Podcasts with a rationale behind them are also more likely to appeal to your academic colleagues and course team. A good starting point would be to list a number of learning outcomes for podcasts and consider how they are linked to the overall learning outcomes of the lesson and the module or the course.

Step 2: Converging with other teaching and learning activities

It is a good practice to integrate your podcasts with the rest of your teaching and learning provision and especially with other learning activities. The more the students see podcasts as part of the overall teaching and learning provision, the better motivated they will be to access and use them. Your students should not perceive your podcasts as added extras.

Step 3: Authors and contributors

Who contributes to podcasts depends on the purpose of the podcasts, and the challenge being addressed. There can be a number of broad categories of contributors:

- teachers, instructors, tutors etc.
- other experts in the field (e.g., practitioners from the industry, eminent researchers, teachers)
- members of the local community
- students on the course
- students who have completed the course

Step 4: Episoding

Depending on your objectives, you need to choose the best way of structuring your podcasts and how frequently to

deliver them. First, are you going to offer a single podcast or a series? If you are going to create a series of podcasts, will it be weekly, fortnightly or monthly? Will they be targeted on specific events (such as induction week), or aligned with assessment events such as examinations? It is good practice to consider these at the planning stage so your students know how many podcast they are going to receive and when to expect them.

Step 5: Reuse and repurposing

Developing podcasts, however enjoyable and useful for supporting student learning, has resource implications. Therefore it is important to consider the reusability of your podcasts, in their entirety or in part. Reusability can be achieved by planning to record your podcasts as small chunks and saving them as separate files with easily identifiable tags / labels. More on this under technology section.

Step 6: Style

Style, in this context, means the degree of formality adopted and the genre (e.g., interviews, discussions, perhaps a drama!) selected for your podcasts. The style of a podcast is important for several reasons. Most educational podcasts are audio for simplicity and usability. Therefore they need to be interesting to listen to as well as being informative, if they are to hold students' attention. Although the target audience of your podcasts are a whole group / cohort of your students, very often they will be listening to your podcasts individually, not as a group. Therefore it is useful to bear in mind to speak as if you are talking to an individual student.
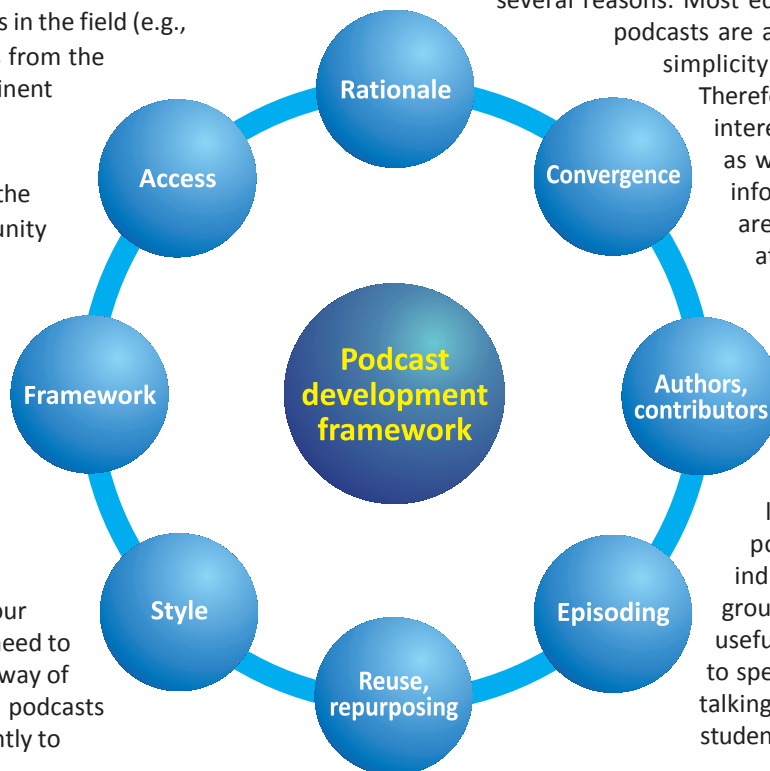

Figure 2: An 8-step Podcast development framework

Step 7: Framework or a plan

Framework or a plan for each podcast is important for engaging your students and helping them to successfully learn. Unlike a text file, an audio file is limited in that we cannot glance at the whole document, or quickly scan it to get a sense of its content, to see how we wish to use it. It is important to provide a brief description at the beginning of the podcast what is going to be covered. This is normal practice in radio programmes, such as documentaries and current affairs, as well as in delivering lessons.

Step 8: Access

We touched on this aspect earlier in this document. While podcasts can be delivered to your students over the Internet using 'push' technologies (using syndication feeds), we need to make it easy for our students to access them. As we have mentioned earlier we can deliver podcasts though a variety of locally available means. Uploading podcasts to a Virtual Learning Environment (VLE) is a commonly used method. Podcasts can also be emailed or distributed using memory sticks, and CD-ROMs.

Conclusions and Implications for Teachers and Policy Makers

The purpose of this document was to introduce what podcasts are and give an insight into how podcasts can be incorporated into teaching, learning and assessment activities. The growing literature on podcasting provides us with ample examples of approaches to using podcasting. The frameworks proposed here can help us to reflect on the bigger picture of teaching and learning activities that teachers and students carry out, both face-to-face and on location, and to select an approach that is most suitable to a recognised teaching and learning issue.

Starting with a clear pedagogical rationale is critical for the success of an approach to podcasting. The podcasting approaches presented here share a common feature; they have all been developed to address a particular teaching and learning challenge. Research into the impact of these approaches has shown positive benefits to student learning.

As the approaches described in this document demonstrated, you can involve not only teachers and subject experts, but also students and other stake-holders in the podcast development process. The content generated from and by students has helped students to learn generic learning and study skills, to alleviate study-related anxieties, and to develop reflective skills. Consider getting your students'

active participation in developing podcasts.

VLE is the main delivery platform for all the podcasts described in this document, and research carried out on student use of podcasts showed that students were able to access and use them without technical issues. Therefore, we can confidently say that VLE-based podcast delivery works well for academic podcasts. If you use a subscription-based approach to deliver your podcasts, it is important to help students understand how they can subscribe to your podcasts in order to access them.

Podcasting can support learning face-to-face, online and on location, and it can help students to learn both conceptual topics and practical subject matter. As this *EdTech Note* has outlined, many social and technical trends are working in favour of using podcasts for teaching and learning. So, please explore, experiment and report on your stories of podcasting for learning.

Improving teaching and learning has been a long-standing concern in all levels of education (see for example, Laurillard, 2002; Biggs, 2003; Entwistle, 2009). Can podcasts really offer a fundamentally different approach to teaching and learning? Certainly the competencies of digital technologies and the scope of Internet delivery have improved exponentially in an incredibly short time span and there are no signs of this progress abating in the near future (Ellis and Goodyear, 2010). Riding on these technological developments, podcasts can offer a tool for academics to innovate their pedagogies. They are one of the simplest means of meeting some of the pedagogic challenges.

Technologies for Creating Podcasts

After designing your podcasts the next step is to record before distributing it. Our objective here is to provide advice on recording audio podcasts. A free open source software is adequate for this purpose. Audacity is commonly used software for creating audio podcasts. It offers the capabilities needed to produce high quality podcasts. The steps related to how to record and edit an audio podcast using Audacity software are described here.

Creating Podcasts with Audacity

(The first version of this guide was created by Simon Kear in 2012. It was revised by Adam Pryor in 2014)

Storing Podcast and Applications

In the My Documents folder on you computer create a folder called **'Podcasts'**. This will be a good place to store all applications required and recordings you make.

Download LAME Encoder

Audacity requires an add-on to create MP3 file called LAME encoder. This can be downloaded from http://www2.le.ac.uk/departments/beyond-distance-research-alliance/projects/impala1/documents/resources-and-tools-for-creating-podcasts/audacity/newest-lame-encoder/. This is a platform independent application.

When prompted select to save the file to the 'Podcasts' folder.

Now all the required applications have been downloaded.

Install Audacity

Run the Audacity installer (.exe file) downloaded previously. This will take you through steps of; selecting the folder in which you would like to install the software (usually Program Files) and also agreeing to the Terms of Usage.

Labelling your podcast

It is important to label a podcast with metadata. This is used to display the details of the podcast on MP3 players and audio-playing software (iTunes), including the Title of the podcast and the name of the 'Artist' or producer. Fill in as many of the fields as you can, as it will help you and anyone else trying to use the podcast later on.

Download Audacity

Visit http://audacity.sourceforge.net/ to download the version of Audacity you require for your operating system.

There are also portable versions available online which do not require installing, and can be used from a memory stick.
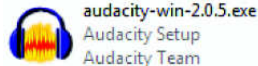
Save Audacity

At this stage of the download select **'Save'** and chose the Podcasts folder as the destination. This box may look different depending on which browser you use.

This application icon will then appear in the folder.
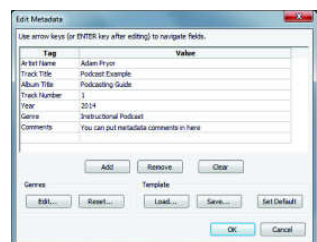
Recording in Audacity

Having installed Audacity, the software is now ready to record your podcast. This will require the use of a microphone which may need setting up in the **Hardware and Sound/Manage Audio Devices** section of the **Control Panel**.

The recording of an audio track is quite self-explanatory: Press record and speak, press stop when complete. There are other editing features which you can explore.

Export to MP3

When you are happy with your recording it can be converted to a MP3, this option is found from **File Menu → Export As MP3** in Audacity. You will then be given a box to label your podcast with metadata.

Finish saving your podcast

After filling in the metadata you will be asked to locate lame_enc.dll. Select "Browse…" and locate the **lame_enc.dll** file downloaded previously from your Podcasts folder. This process only needs to be done once, you will not be asked on subsequent conversions.

Once the **lame_enc.dll** is located, you will be prompted to select where you want to save your podcast and give it a file name. It's recommended to store the podcast file in the Podcast folder.

Your podcast is now saved in .mp3 format. Make sure to also save your Audacity project as well, so you have the option to edit it later, should you want to.

This completes the process of podcast recording.
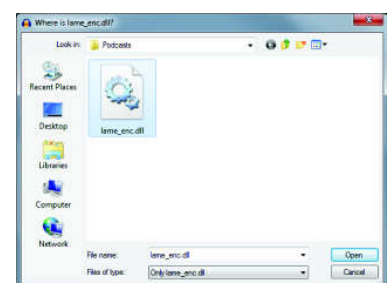
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