Podcasting as a mobile learning technology: a study of iTunes U Learners

Podcasting as a mobile learning technology: a study of iTunes U learners

Abstract

Despite the fact that portability was perceived as one of the major benefits of podcasting as a teaching and learning tool, little evidence has been found of users taking advantage of this feature for academic use. This paper reports on a major study (1886 responses) of iTunes U users. The analysis compares the responses of those participants who use static devices to play the materials they download with those of users who utilise mobile devices. The results show that more users play iTunes U materials from mobile devices than static devices. Users share some similarities in their use of podcasts but some marked differences as well, in contrast with previous research. We argue that different perceptions and practices are based on whether the users are formal or informal learners and discuss the implications for the use of podcasting as a mobile learning technology.

Keywords: Mobile Learning, Podcasting, iTunes U, Lifelong Learning, Elearning, Informal Learning

1 Introduction

When, 10 years ago, podcasting started to become a popular means of producing and delivering audio-visual materials, many academics began to explore its potential as a teaching and learning technology. Researchers identified a number of potential benefits and high among them was portability: the ability to make learning available anytime and anywhere (Blaisdell, 2006; Cebeci and Tekdal, 2006; Clark and Walsh, 2005; Evans 2008). In other words: podcasting was seen as a technology that would enable mobile learning.

A podcast is an audio or video file that is distributed over the internet, normally through a subscription service as part of a collection of files. These media files appear in a variety of formats (most commonly mp3s for audio and mpeg for video, although other formats such as m4a, m4v and mp4 are also used), and can be played on a number of devices (portable and static). Whilst some file formats used to be unique to specific devices, creating a barrier for users to download resources from certain podcast repositories, most devices are able to play a wide variety of file format nowadays. Although podcast collections sometimes include additional resources such as PDFs, which can be downloaded alongside the audio or video files, these additional resources are not usually considered podcasts as such.

Definitions of mobile learning have evolved with the emergence of different types of devices and the affordances they provide. An early definition of mobile learning stated that it takes place “when the learner is not at a fixed, predetermined location, or when the learner ‘takes advantage of the learning opportunities offered by mobile technologies’” (Kukulska-Hulme, 2005, p. 1). Those learning opportunities have increased vastly in the last few years with the proliferation of devices that can afford mobile learning (mobile phones, personal media players, smartphones, small tablets) and with the advances in technology

that allow storage of content (larger memory at affordable prices, cloud computing) and connectivity (higher download speeds, lower cost). Some definitions of mobile learning have been device-centric, whereas others describe mobile learning as “mediated by mobile devices, characterised by the mobility of the learners, and/or the mobility or accessibility of the content considered” (Hamm et al, 2014, p.3). Mobile learning achievements include enhancing learning, reaching out to remote learners, theory building, motivation and community building, although not without challenges (Traxler, 2011). The rapid growth in availability and popularity of mobile devices have made them ubiquitous in many territories, with some arguing that “as mobile devices become even more powerful and versatile, we are likely to see more users make them their primary, perhaps their sole computing devices.” (Godwin-Jones, 2011, p.8). Podcasting is an example of didactic mobile learning, defined as “learning from mobile educational material (…) in a way that responds to the potential and the limitations of mobile devices” (Kukulska-Hulme and Traxler, 2005, p. 26). Although advances in connectivity mean that podcast users can also engage in discursive mobile learning, based on interaction among mobile learners, didactic mobile learning remains the most common way users engage with podcast materials.

Many of the recommendations of mobile learning practice apply to the use of podcasting for learning. These include the provision of resources that can be used autonomously, appropriate length, taking screen size into consideration in the design of resources (which applies to video podcasts) and chunking knowledge as independent learning objects to facilitate processing of information (Ally, 2004). However, these and all other affordances that podcasting can bring can only be considered mobile learning if users access podcasts from their mobile devices rather than from their desktop or laptop computers. When learners listen to podcasts through their mobile devices, they integrate their learning into their lifelong learning processes, as advocated by theories of informal and lifelong learning, which view learning as something that can happen in everyday life outside the classroom, whether intentionally or accidentally (Naismith, Lonsdale, Vavoula, and Sharples, 2005). Podcasting technology also facilitates ‘just in time learning’ “where learners can often take advantage of unexpected free time since they often have their devices with them” (Evans, 2008, p. 492).

Users of mobile devices such as mobile phones tend to utilise them in short windows of time throughout the day rather than in dedicated sessions. A report by Ofcom (the independent regulator and competition authority for the UK communications industries) claims that 81% of smartphone users keep their device switched on all day. It also reports that

> over half (51 per cent) of adults and two thirds (65 per cent) of teenagers say they have used their smartphone while socialising with others, nearly a quarter (23 per cent) of adults and a third (34 per cent) of teenagers have used them during mealtimes and over a fifth (22 per cent) of adult and nearly half (47 per cent) of teenage smartphone users admitted using or answering their handset in the bathroom or toilet. (Ofcom, 2011, para 9)

The concept of taking the opportunity to learn during short free time periods has implications for mobile learning design, as learners are less likely to engage with resources that require a long time to process or deep concentration. In 2007, Kenning speculated that Mobile learning could be expected to be "a highly fragmented experience liable to be fraught with distractions" (p. 194). Stone's (2009) concept of Continuous Partial Attention (the process of paying simultaneous attention to a number of sources of incoming information, but at a superficial level) is one that applies to engagement with such mobile devices for some users. There is a wide variety of podcasting formats, and some (shorter, more concise) may therefore be more likely to engage the learner than others. The availability of new affordances in such devices, while having great potential, does not ensure that the potential will be exploited: "just because a device can be used for something it doesn't mean it will be used for that purpose" (Bell, 2008, p. 182).

The use of podcasting for learning fits better with the principles of mobile learning since smartphones and tablets became available and widely owned, as these devices combine access to podcast aggregators such as iTunes, an internet connection which allows direct download, and the capability to play the files downloaded.

Apple's iTunes store has become one the most popular podcast aggregators worldwide. In 2007 Apple launched iTunes U, a repository for educational content provided at first by universities only, later by other institutions such as museums or further education colleges. Over one billion iTunes U resources have been downloaded between its launch and February 2013 (Apple press release, 2013). iTunes U is multiplatform, not exclusive to Apple operating systems, and can be used both on desktop computers and mobile devices. Apple referred to iTunes U as 'the university in your pocket'. This slogan, however, soon appeared not to be true, as research projects involving the use of educational podcasts suggested that these were being used on desktop computers rather than mobile devices.

This paper will review past and current literature on podcasting as a mobile learning technology and present a number of key questions about learners' use of podcasts. It will then present the data collected from a large study into users of iTunes U resources, discuss them and present conclusions about whether the delivery of media files through such platforms can be considered a mobile technology.

2 Podcasting as a mobile technology for teaching and learning

A mobile technology?

Even though many researchers were quick to identify the affordance of mobile learning as a benefit of podcasting technology, little evidence was available to confirm this at the time. A number of empirical data began to arise from early studies into actual use of podcasts among learners, some of which addressed the issue of mobile use. Two different projects were carried out in 2004 to provide podcasts and mobile devices to learners, one in Osaka Jogakuin

College in Japan (McCarty, 2005), and one in Duke University, in North Carolina, U.S. (Belanger, 2005). Both studies reported very positive first impressions among learners, perhaps due to the novelty factor and excitement that surrounded the initiatives. Among the first projects carried out in Europe was the IMPALA project from the University of Leicester in 2006. Their pilot project reported that only 20% of participants (n=24) loaded podcasts to a mobile device (Edirisingha and Salmon, 2007). A later study (Salmon and Edirisingha, 2008) revealed that only 7% of participants (n=35) transferred files to their mp3 player. Many other studies coincided in this low transfer of podcasts to mobile devices: a report of a research project from Charles Sturt University in Australia (n=39) stated that "an overwhelmingly vast majority preferred to listen to the podcasts *using a desktop/laptop computer* [authors' emphasis]" (Lee and Chan, 2007, p. 210). Copley (2007) reported that 94% of his students (n=84) played podcasts on their PCs, and Malan (2007) found that the percentage of learners using iPods to listen to mp3s was 29% compared to 71% who used computers. Similarly, Evans et al (2008) reported that 20% of the participants in their study of podcasts used a portable device whereas 80% listened using their PCs. A larger study (n=256) by Bennett (2008) also found that the majority of students listened on computers rather than mobile devices.

Later research projects continued to find a similar trend. McKinney et al (2009): reported that only 20% of students listened to podcasts on a mobile device. Carvalho, Aguiar and Maciel (2009) concluded that their students didn't take advantages of mobility either. Walls et al (2010) stated that "most students indicated that they use a computer for playing educational related files" (p. 375) and O'Bannon et al (2011) concluded that participants mostly downloaded podcasts through a VLE, preferred to listen at home and did not transfer to mobile devices. Kazlauskas and Robinson (2012) also challenged the assumption that students listen to podcasts if they are made available to them and presented evidence that many students did not use podcast resources. They consider it imperative not to ignore or neglect the student population who reject podcasts.

Some of the results from these studies were affected by mobile device ownership. In some of the earlier research projects, mp3 players were loaned to students, who were only relatively familiar with them and with podcasting in general. For projects were participants were not given devices, ownership of these was not as widespread as may be assumed nowadays: Dias et al (2007) carried out a study of 1248 Japanese university students and found that only 55% used mp3 players regularly. In a study by Walls et al (2010), 72% of participants reported owning a mobile device that could be used to play mp3 files, meaning that almost a quarter didn't have access to mobile device. Devices have since become cheaper and more popular, and later studies have found a larger proportion of mobile device ownership: 100% of participants in Bradley and Holley's (2011) study owned a mobile phone, of which 80% were smartphones (their participants were mostly under 25). In a US study of undergraduate students in 2012, 67% of students reported using their smartphones for academic purposes, up from 37% in 2011 (Dahlstrom, 2012).

There is a disparity between the low transfer reported and the users' opinions of the mobility potential of podcasts. Whilst many users value the affordance of portability, they do not appear to actually use it (Malan, 2007). Evans (2008) reported that 79% of the students who took part in his study agreed that it was important to be able to listen to podcasts when and where they want. When asked to provide further details, however, only a quarter of respondents actually stated that they listened to podcasts whilst travelling. Bollinger et al (2010) claimed that their students liked the portability that podcasts can afford, but did not provide any data on whether their students actually had listened on a portable device. Although some claim that "the portability of a podcast is an important factor in its getting used by students" (Abdous et al, 2012, p. 44), as Walls et al conclude: "portability, however, like any technological provision, is only convenient if people actually use it" (Walls et al, 2010, p. 372). Not all research findings support this, however. An international study across five different countries and contexts found that "when students are offered appropriate mobile resources then they will make use of them" (Kukulska-Hulme et al, 2011, p. 32).

The low mobile use of podcasts is therefore an issue that has appeared consistently on the research in this field, leading some to state that "students did not take full advantage of this technology as they do not use mobile devices to listen to podcasts" (Carvalho, Aguiar and Maciel, 2009, p 139). To answer why students did not subscribe to podcasting syndication services, Lee et al (2009) suggested lack of knowledge of the technology, fixed models of interaction with resources, and the type of content or lack of regular updates among others. They proposed further research into the volume and nature, type and use, and authorship of the podcast content. A possible explanation for this lack of use of podcasts using mobile devices is that many of the research projects that report it were carried out in a context where the podcasts were provided by a tutor to their own students for a specific purpose (homework, pre- or post- class activities) through the institution's Virtual Learning Environment (VLE) and not a podcast aggregator. In some cases, students had to complete activities based on the podcasts they had listened to. It makes sense that students would listen to the resources provided through a VLE whilst logged on rather than transfer them to a mobile device for later listening. In addition, it is likely that any follow-up activities would also be VLE-based, making the decontextualisation of the resources from their source detrimental, a powerful reason not to transfer podcasts to a mobile device or listen on the go.

The question of whether podcasts can be considered a mobile learning technology is therefore debatable, and one whose answer affects not only the identified potential of podcasting as a teaching and learning tool, but has an effect on design and use.

An academic activity?

Another issue that many of the studies on podcasting as a teaching and learning tool highlighted was the fact that engaging with podcast resources was perceived as an academic activity. Learners value the flexibility that mobile learning can afford: some 59% of the respondents in Bradley and Holley's

(2011) research placed importance in the ability to learn at any time in any place, as had 79% of the participants in Evans' (2008) study. Despite this, practice is different from impressions. Edirisinha and Salmon (2007) found that 47% of their respondents listened to the podcasts they were provided with without doing anything else (i.e. focusing solely on the podcast material and not as part of another activity), and 33% took notes whilst listening. McKinney et al (2009) found that taking notes while listening to the podcasts significantly achieved better grades, and students who did so also tended to listen multiple times. Lee and Chan (2007) reported that most of their participants set aside time to listen to study podcasts. Respondents in the study by Evans (2008) did not multi-task either, as the majority of students did not listen to podcasts while doing something else. Similarly, in a study of Japanese students' use of mobile phones for language learning, Stockwell (2013) found that only 15.4% of students used their devices whilst in transit. Some research has been carried out on the effect of multitasking on learning (Clarebout et al, 2008; Coens et al, 2011; Doolittle and Mariano, 2008), and the studies found that students in stationary conditions retained information better than those who were walking or jogging, although it is hard to prove that this was a causal correlation.

The lack of transfer to mobile devices and the perception of listening to podcasts as an academic activity appear to contradict the mobile and informal qualities that podcasting was supposed to bring to learning. Bennett (2008) concluded that

> the unique properties of a podcast (i.e., a regularly updated series of episodes that can be subscribed to and listened to on a portable mp3 player) that were initially put forward as reasons why podcasting may be an effective way of helping students to learn (Campbell, 2005) actually appear to be relatively unimportant when using a podcast to enhance face-to-face campus-based courses (p.8).

Once again, given the context of podcasts made available to students by their own instructors as part of their home or preparation work, it is hardly surprising that students perceived listening as an academic activity.

Another relevant debate in the literature on podcasting as a teaching and learning tool concerns the view of podcasting as supplementary to formal learning. Many researchers found that students rated podcasts highly as supplementary materials, to catch up on missed lectures, and as revision tools (e.g., Bennett, 2008; Copley, 2007; Daniel and Woody, 2010; Evans, 2008; Fernandez et al, 2009; Lee and Chan, 2007; Malan, 2007; Walls et al, 2010). Some of these researchers therefore questioned the potential use of podcasts as the main source of learning for their subject or as a replacement for formal learning. In most cases this was linked to the fact that the participants in their own research used the podcast resources as supplementary to the main teaching they were enrolled in at those institutions where the research was undertaken.

The question of whether listening to podcasts is an academic activity, with users focused on the content as they would with other learning resources such as

books, or a more informal activity closer to infotainment could also have an effect on how podcasts are designed in terms of content and format, and how these resources will be used.

Different learners, different practices

The target learners for mobile learning have been classified into school children and their carers; higher education students; young adults not in education or work; the underserved in development contexts; people in the world of work; communities, friends and families (lifelong learners); and learners with special needs and disabilities (Kukulsa-Hulme, 2013, pp 149-151). Some crucial variables in the research into podcasting as a mobile technology may depend on the type of learner who downloads podcasts, their reasons for doing so, and the method they use to access them. Research by Hürst, Welte and Jung (2007) provided evidence that different types of learners engage with podcasts in a different way. They found that 'internal' learners (enrolled on a course and usually young) used podcasts in a different way to 'external learners' (interested public outside the university), who found the same podcast resources on iTunes U. The age of these 'external' learners ranged from 17 to 53. They also differed in their motivation for listening: 'internal' learners listened for credit as part of the activities in their regular courses. In contrast, 'external' learners listened mainly because of personal interest with some indicating that they listened because of education or work reasons. Hürst et al. concluded that the added value of podcasting is mobility and whereas 'internal' learners tended to access podcasts on traditional devices, 'external' learners took advantage of RSS. Similarly, Heilesen (2010) suggests that there are differences between regular students, who sit in front of the computer and make time to listen, and the interested public, more likely to be multitasking or listening on the move.

The delivery medium of podcasts, hence, may have an effect on the audience they find. It is clear that podcasts delivered through a VLE, usually behind password protection, will only be available for the consumption of students registered at the institution that hosts the materials (although more and more institutions are offering some of their materials as Open Educational Resources or through MOOCs). When the same materials are made available on platforms such as iTunes U, they find a completely new audience that is unknown to the instructor and the institution, therefore the teachers who provide the materials are 'teaching strangers' (Rosell-Aguilar, 2013a). This new audience, following the findings above, is likely to be part of a different demographic, have different reasons for downloading the podcasts, and engage with them in a completely different way. It is important to put effort into understanding mobile learners, their characteristics and needs (Kukulska-Hulme, 2013).

Research questions

Based on the findings presented above, and the questions they pose, there is a need to know more about who uses podcasts and how. This is related to which platform is used to find and download such resources and the motivations for engaging with them. As stated earlier, most previous literature has focused on podcasts delivered by an instructor to their known audience, but there has been

little research into the delivery of such materials through a generic platform such as iTunes U. A major research study into iTunes U users, which this paper is part of, found that they are quite different from those learners that most previous research has focused on, both in terms of their personal profile and their downloading and listening habits. The subjects downloaded also made a difference in the type of audience the podcast resources found (Rosell-Aguilar, 2013a, 2013b).

This paper will focus on the differences between users of iTunes U resources depending on whether they listen to the podcasts they download on a mobile or static device: it will present any differences shown by variables including age, gender, subject, enrolment on a course, reasons for listening, RSS subscription transfer to mobile devices, note-taking, and whether the iTunes U resources are the main source of learning. It will also present similarities in the rating and perception of learning among users of both mobile and static devices.

3 Methods

Context and tools

This study is based on the use of iTunes U resources from the UK Open University (OU). As a distance learning university, the OU has a history of delivering high-quality teaching content online. It is among the institutions which deliver the largest number of iTunes U resources world-wide, with over 65 million downloads between June 2008 and November 2013 (Apple, 2013; Open University, 2013). Despite being best known in the UK, nearly 90% of its iTunes U materials are downloaded from outside the UK.

This study is part of a larger research study into the use of iTunes U. The other two strands of the larger study focused on the profile of the iTunes U learner in general (Rosell-Aguilar, 2013a) and on its use for language learning, as languages is the most downloaded subject from iTunes U at the OU (Rosell-Aguilar, 2013b). The survey contained questions about the users' personal profile, their download habits, how they used the resources they download and their opinion of these materials, among others (for fuller details of the survey and the results arising from the answers to these questions, see Rosell-Aguilar, 2013a). Although there is some overlap, this third strand focuses solely on the results from the point of view of podcasting as a mobile learning technology, which were not included in previous reports.

SurveyMonkey was used to create a survey and gather responses through a link placed on the OU iTunes U homepage and all its collections. The survey ran between August 2009 and April 2011. A total of 2129 responses were collected. The vast majority of responses (95%) was gathered in the first 12 months that the survey ran, as changes to the layout of iTunes U after that time limited both visibility and access to the link to the survey from mobile devices and desktop computers. The data gathered were analysed using SPSS 21.

Participants

Participants were asked whether they used iTunes U resources mostly for learning or teaching. Respondents who responded that they used the iTunes U resources mainly for teaching (n=79) and those who skipped that question (n=159) were removed from the survey, as this study focused on learners (n=1891). Those respondents who did not own any devices able to play mp3s or video files (n=5) were also removed (n=1886).

Of the 1886 respondents, 1046 (55.5%) were male, 823 (43.6%) were female and 17 (0.9%) chose not to disclose their gender. Distributed by age, 143 (7.6%) were 18 or under, 203 (10.8%) were 19-24, 354 (18.8%) were 25-34, 393 (20.8%) were 35-44, 373 (19.8%) were 45-54, 305 (16.2%) were 55-64 and 114 (6%) were over 65.

The crosstabulation of ages and gender of the respondents is presented in Table 1.

	Male	Female	Prefer not to say
18 and under	54 37.8%	86 60.1%	3 2.1%
19-24	109 53.7%	94 46.3%	0 0.0%
25-34	195 55.1%	155 43.8%	4 1.1%
35-44	209 53.2%	180 45.8%	4 1.0%
45-54	219 58.7%	151 40.5%	3 0.8%
55-64	182 59.7%	122 40.0%	1 0.3%
over 65	78 68.4%	34 29.8%	2 1.8%

Table 1: age and gender crosstabulation.

Respondents were asked where they lived. The US and Canada represented the biggest proportion of respondents (34.8%), closely followed by the UK with 33.5%. The rest were from another European Country other than the UK (17.9%), Australia / New Zealand (4%), Asia (3.8%), South and Central America (3.2%), Africa (0.7%), the Middle East (0.7%) and finally 1.4% lived in other countries.

Table 2 presents the breakdown of occupations. Over half the respondents (58.3%) were employed (either full, part-time or self-employed) and only 18.1% were students (full or part-time).

full-time paid employment	40.2% 756
In part-time paid employment	6.8% 128
Self-employed/freelance	11.3% 213

Voluntary work (including charitable work)	1.8% 34
Family responsibilities	2.9% 54
Unemployed	5.2% 98
Retired	8.6% 162
Student (full time)	15.5% 290
Student (part time)	2.6% 48
Other	3.4% 63
Prefer not to say	1.8% 33
Total	1,879

Table 2: occupation of participants

4 Results

This section will present the overall results with particular focus on any differences between learners who use mobile or static devices. Within this, it will present any differences shown by variables including age, gender, subject, enrolment on a course, and whether the iTunes U resources are the main source of learning.

Participants were asked whether they mostly listen to the iTunes U resources they download on a static device (desktop or laptop computer) or on a portable device (portable media player, mobile phone…). Of the 1733 who responded to this question, 751 (43.3%) listened mostly on a static device and 982 (56.7%) on a mobile device. This variable is used in this section to differentiate static learners from mobile learners, and results will be presented according to this.

The data relating to gender and age of respondents overall were presented in section 3. The gender split among users was identical for users of static devices and mobile devices (45.6% male / 54.4% female).

The breakdown of ages depending on what type of devices they use is presented in Table 3

	Static	Mobile
18 or under	53 41.7%	74 58.3%
19-24	97 53.3%	85 46.7%
25-34	136 41.8%	189 58.2%
35-44	135 37.2%	228 62.8%
45-54	150 44.0%	191 56.0%

55-64	126 43.0%	167 57.0%
over 65	54 52.9%	48 47.1%

Table 3: age of different type of device users

The participants downloaded iTunes U resources representing a large variety of subjects. A number of subjects were downloaded more often than others, with languages, arts and humanities and science in the lead. Figure 1 shows the most popular subjects and the proportion of downloads they represent.

<Insert Figure 1>

Figure 1: Subjects downloaded

Table 4 presents the breakdown of some of the subjects that participants downloaded from iTunes U and the type of user.

	Static	Mobile
Languages	152 37.4%	254 62.6%
Arts and Humanities	141 41.3%	200 58.7%
Science	145 50.7%	141 49.3%
Psychology	57 37.7%	94 62.3%
Social Sciences	55 43.3%	72 56.7%
Mathematics and Statistics	44 57.1%	33 42.9%
Engineering and Technology	27 40.3%	40 59.7%
Creativity and Design	36 56.3%	28 43.8%
Computing and ICT	27 50.9%	26 49.1%
Law	15 35.7%	27 64.3%
Health and Social Care	12 35.3%	22 64.7%
Other	40 47.1%	45 52.9%

Table 4: subjects and different type of device users

Some 1728 participants responded to a question about whether they were enrolled at a school, college or university on a course in the subject that they downloaded iTunes resources for. A total of 483 (28%) were enrolled whereas

1245 (72%) were not. The difference between users of different types of device was not pronounced: among the users of static devices, 29.6% were not enrolled and 70.4% were. Similarly, 26.7% of mobile device users were not enrolled whereas 73.3% were.

In response to why the participants were interested in the resources they downloaded, 1243 (71.7%) chose 'personal interest' as their reason. Some 300 (17.3%) respondents chose 'relevant to my current studies' and 190 (11%) chose 'relevant to my profession'. Table 5 shows the split between users of mobile and static devices.

	Static	Mobile
Personal interest	547 44.0%	696 56.0%
Relevant to my current studies	132 44.0%	168 56.0%
Relevant to my profession	72 37.9%	118 62.1%

Table 5: reasons for downloading and different type of device users

Participants were asked whether they regarded the resources they download as their main source of learning for that subject or whether the resources were supplementary, additional to other learning they do. Of the 1715 participants who responded to this question, 1502 (87.6%) regarded the resources as supplementary and 213 (12.4%) as the main source of learning. Among those who chose supplementary, 44% were users of static devices and 56% users of mobile devices, whereas for those who chose main source of learning, 37.6% were users of static devices and 62.4% users of mobile devices.

A total of 351 (20.3%) users mostly subscribed to the iTunes feed, whereas 573 (33.1%) mostly downloaded individual files. The most common practice for 809 (46.7%) respondents, however, was doing both. Among the remaining 53.4% (923) respondents who expressed a preference for one method over another, 62% (573) mostly download individual tracks and 38% (351) mostly subscribe. Of the 351 respondents who mostly subscribe 35.9% are users of static devices and 64.1% mobile device users, whereas of the 573 who mostly download individual tracks 48.2% are static device users and 51.8% use mobile devices.

Participants were asked if they transferred the resources they downloaded to a mobile device. Some 674 participants (38.9%) responded that they always transferred to a mobile device, 436 (25.2%) that they did so most of the time, 291 (16.8%) did it sometimes, 120 (6.9%) rarely and 212 (12.2%) never transferred the iTunes U resources to their mobile device. The differences between those who use static and those who use mobile devices were very marked, as seen in Table 6.

	Static	Mobile
Yes, always	71 10.5%	603 89.5%
Most of the	117	319

time	26.8%	73.2%
Sometimes	242 83.2%	49 16.8%
Rarely	116 96.7%	4 3.3%
Never	205 96.7%	7 3.3%

Table 6: transfer habits and different type of device users

A question on the survey was added to ascertain whether users took notes while they listened. Of the 1651 participants who responded to this question, 49 (3%) always took notes, 130 (7.9%) took notes most of the time, 563 (34.1%) did it sometimes, 465 (28.2%) rarely did so and 444 (26.9%) never took notes. Table 7 shows that, as was the case in the previous question, the differences between static and mobile device users are quite marked.

	Static	Mobile
Always	33 67.3%	16 32.7%
Most of the time	72 55.4%	58 44.6%
Sometimes	252 44.8%	311 55.2%
Rarely	182 39.1%	283 60.9%
Never	171 38.5%	273 61.5%

Table 7: taking notes and different type of device users

Among the respondents who listened to iTunes U resources on a mobile device (n=980), 359 (36.6%) made time to listen and considered listening the main activity they were doing at that time. For 621 (63.4%) listening was part of another activity, such as exercising, doing housework or travelling.

Some 1651 participants responded to a question about whether they thought that listening to the resources they downloaded from iTunes U helped them to learn about the subject. Of these, 1619 (98.1%) answered ‘yes’ and 32 (1.9%) answered ‘no’. The split between static and mobile device users was very much the same as the overall split for those who answered ‘yes’ (42.4% static / 57.6% mobile). In contrast, of the 32 participants who answered ‘no’, 24 (75%) were users of static devices and 8 (25%) were mobile device users.

Of the 1501 participants who responded to a question which asked them to rate the quality of the iTunes U resources they download 609 (40.6%) rated the materials ‘very good’, 665 (44.3%) ‘good’, 184 (12.3%) ‘OK’, 9 (0.6%) ‘not so good’, 1 (0.1%) ‘terrible’ and 33 (2.2%) replied that the quality varies. The differences between device users are presented in table 8.

	Static	Mobile

Very good	273 44.8%	336 55.2%
Good	276 41.5%	389 58.5%
OK	85 46.2%	99 53.8%
Not so good	6 66.7%	3 33.3%
Terrible	1 100.0%	0 0.0%
It varies	20 60.6%	13 39.4%

Table 8: quality ratings and different type of device users

5 Discussion

This section will discuss the results from the survey in the light of previous research, where available. Given the lack of data from any sort of similar survey into iTunes U users for some of the questions, some degree of speculation is used in this discussion. Comparisons are also made with stereotypes about learners and users of technology in general, although these are subjective.

Different learners?

The fact that more participants in this study listened on a mobile device rather than on a static device is the most striking, and one that immediately sets the scene for a picture of a podcast user who is very different from the participants who took part in most previous reports. Participants fitted with some of Kukulska-Hulme's (2013) target learners in m-learning (mostly those in the world of work and lifelong learners - also Higher Education students and to some extent young adults not in education or work).

Given that there is often a stereotype that men are more interested in gadgets and technology and more men than women took the survey, one could assume that iTunes U is more appealing to men than to women. Previous results from this project showed that the gender difference among users was linked to age, with women more likely to use iTunes U the younger they are, whereas men represented the highest proportion of users for older students (Rosell-Aguilar, 2013a). Therefore it is interesting to note that the participant profile for the mobile learning strand of this research showed that the split between male and female users of iTunes U was exactly the same for users of mobile devices and users of static devices, indicating that gender and device use are not correlated.

The participants in this study were quite different in terms of age from those who took part in most of the previous studies published, as those were mostly under-25 university students with few exceptions (Hürst et al, 2007; Kukulska-Hulme et al, 2011). There were some age differences between users of static and mobile devices, as shown in table 3. There does not appear to be a consistent pattern, though, as the age range with the most users of mobile

devices (62.8%) was 35-44 and users of static devices outnumber users of mobile devices in the 19-24 and the over 65 brackets. Whilst older people are often stereotyped as being less likely to use modern technology and devices, it would seem logical that more users in the over 65 age range might use static devices, as the results show. However, the results contradict the opposite stereotype that younger people are more likely to use new gadgets and technology, given that the 19-24 age bracket was the one with the largest proportion of users of static devices. This, however, may be related to available income rather than preferences.

Not much can be discussed about the preferences for different subjects by users of different types of device, as participants in previous studies took a wide variety of subjects and there was no clear pattern among the participants in this study. In some subjects, the split between users of mobile or static devices was very close (e.g. Science and Computing and ICT both with an almost 50/50 split). Mathematics and Statistics, and Creativity and Design were the subjects downloaded by a markedly larger proportion of users of static devices. The remaining subjects attracted more users of mobile devices, with Languages, Psychology, Law, and Health and Social Care attracting over 60%. The survey did not ask any further questions that could explain these differences. It may be for reasons of the type of material available for different subjects or perhaps the subjects themselves.

An academic activity?

With regards to enrolment on a formal course on the subject they downloaded iTunes U resources for, the results showed that 72% were not enrolled. This is very different from previous research, which was mostly carried out with students enrolled on courses at the institutions where the research was undertaken. The data here show that only 17.3% of respondents downloaded resources because they were relevant to their studies. It seems therefore that iTunes U attracted more casual or informal learners. Cross-tabulating whether participants were enrolled on a course in the subject they downloaded iTunes U resources for was used as a measure of whether respondents could be considered formal or informal learners. There were no major differences in terms of enrolment between users of mobile or static devices, which suggests no correlation between informal learning and the use of one type of device over another. Interestingly, although the proportion of static device users (44%) and mobile device users (56%) was identical for learners who downloaded for personal interest and for those who do it because the resources are relevant to their current studies, there was a more marked difference among learners who engaged with the resources because they were relevant to their profession (37.9% static / 62.1% mobile). It is worth remembering here that users who downloaded iTunes U resources for teaching purposes were removed from the data analysis, hence this result refers to learners who engaged with the iTunes U content for reasons of professional development. It may be the case that those learners, being mostly employed, have more resources to purchase and use a mobile device, or it could be that the content may be more adequate for practices such as just-in-time learning using a mobile device.

A large proportion (87.6%) of respondents used the iTunes U resources as supplementary to other learning they did. This is consistent with previous research. We can only hypothesise as to why they did so (apart from the case of those 483 respondents who were enrolled on courses on the subject, as they clearly had access to other sources of learning). It may be that these learners were using other podcasts or independent learning resources such as websites or books, given that 71% of respondents used the iTunes U materials for personal use rather than because it was relevant to their professional development or their current studies. Since they were iTunes U users, it makes sense for them not to restrict their own learning opportunities to materials from one single institution. For the 213 (12.4%) respondents who regarded the iTunes U resources as their main source of learning, the proportion of mobile device users was much larger (62.4%) than the proportion of static device users. This also fits with the idea of using iTunes U materials as informal learning that can be accessed from a mobile device on the go or in short convenient instances and is consistent with previous findings which suggested those who study formally do not listen on the move and those who learn informally do.

Previous research on the use of RSS subscription had found very little evidence of subscription. This study found that nearly half of respondents both downloaded individual files and subscribed and of the remaining respondents 38% mostly subscribed. It also found that 64.1% of the respondents who subscribed and 51.8% of those who downloaded individual tracks were mobile device users. There appears therefore to be a preference among mobile device users to subscribe. This is a much higher proportion of subscriptions than previously found and is very surprising. The “subscribe” button is more prominent on the desktop version of iTunes and it might have been assumed that users of mobile devices may want to choose which tracks they download and when they do so to prevent using the limited available storage space on their device and their mobile data for what may perhaps be unnecessary or irrelevant downloads. This, however, is based on the assumption that use of a mobile device signifies the learner is mobile as opposed to a learner preference to use their mobile device regardless of location (e.g. at home).

Mobile use

The question about whether participants transfer the resources they download to a mobile device was worded in such a way because at the time the survey was carried out iTunes offered the possibility of direct downloads to iOS devices, but iTunes U files could not be downloaded in this way. Nowadays this question would ask whether users download files directly to their mobile device or to a static device. Unsurprisingly, mobile device users mostly transferred to a mobile device and static device users in the majority never did. Likewise, static device users were much more likely to take notes.

A sizeable proportion of mobile device users (63.4%) listened whilst they took part in another activity (exercise, commuting, housework). As discussed in section 2, static use has previously been linked to better attainment than mobile use. This study did not look into attainment, but asked respondents to rate the

iTunes U resources they downloaded and whether they believed they helped them to learn. The results show that an overwhelming majority believed they were learning, and there were no major differences between mobile and static users among them. Mobile device users were also more positive in their rating of the resources.

These positive ratings and impressions may be related to expectations from learning materials and motivation for learning. Most participants in this study downloaded for personal interest. This made their motivation for learning very different than for those who were enrolled on a course and therefore likely to be assessed. Those students would expect the materials to provide a certain amount of whatever they considered 'quantifiable' learning in terms of results. Listening to the resources needed to be worth their study time. It would also make sense for them to want to engage with materials which were closely linked to their curriculum and at the appropriate level for them. In contrast, the informal learners may have been happier with any resource that provided a more general overview of the subject, or which simply satisfied their curiosity about it. Given the large proportion (nearly a quarter) of participants who downloaded languages materials, it may be that they just wanted exposure to the language they were learning. Those learners were probably more likely to perceive listening to podcasts or iTunes U materials as 'infotainment', much like people would listen to a radio programme or documentary because it is of interest. Many radio listeners do not make time to engage with a programme or take notes. They are likely to be multitasking and engaging with other activities or people, yet many would consider they have benefited / gained an awareness of the topic / learnt from what they listened to. It may therefore be the case that motivation and expectations of the resources may be a stronger determinant of which device is used to engage with the materials they download and other related activities such as taking notes. This will warrant further research, as discussed in the next section.

6: Limitations, Further Research and conclusion

Limitations

A number of limitations affected this study. Firstly, the study would be hard to replicate as changes to the layout of iTunes U after the survey ran limits access to links within the iTunes U collections from mobile devices. Secondly, the participants who took the survey were iTunes U users, and not part of the general public. This means that they were likely to have expectations of iTunes U and the potential of resources available on it. Thirdly, there was no way to confirm whether the reported positive impressions of learning through iTunes U matched actual improvement in knowledge of the subject.

In addition, the research was carried out with users of iTunes U materials from one single institution (even though it is a hugely popular institution on iTunes U) and a distance learning institution in particular (although as Diehl, 2013, points out, mobile learning has historically been a feature of distance education). A wider sample from different institutions might have provided a more varied sample. The fact that most participants were not learners from the institution, or

even in the same country, levels off any possible imbalance that this could have created, however.

Most of the research studies cited in section 2, as well as the data collection for this study, were carried out before the relatively-new affordance of downloading directly to mobile devices. This could be interpreted as a limitation. However, the fact that the results from this study show that many learners / users were listening on mobile devices and on the go, shows that even before this affordance was available, users were making use of the mobility that podcasts can provide. Furthermore, the question in the survey which asked participants where they listened served as a control question to ascertain whether respondents used mobile or static devices regardless of how the materials were loaded to devices. The fact that users can now download directly to their device is surely likely to increase the mobile use of podcast resources.

Further research

Even though some might argue that 10 years after its popularisation podcasting is no longer a new tool for teaching and learning, and therefore might not be worthy of further research, there is still scope for it.

Although there is a large amount of research available on the use of podcasting for teaching and learning, studies on the use of iTunes U have been limited so far, and focused on 'internal' learners. Because of this, the scope of research this study reports on has been mainly exploratory and descriptive. After this quantitative approach, it would be useful to further develop knowledge in this area with qualitative research looking into actual attainment, learner expectations, and the cognitive processes involved in listening to iTunes U resources, particularly among informal learners. As mentioned in section 5, the issue of whether podcasts in general and iTunes U resources in particular are perceived as learning or simply as infotainment may be related to motivation for listening and have an effect on how users utilise and evaluate such resources. The manner in which resources are used, and in particular the effect of continuous partial attention, would be a worthy subject for further research too.

In addition, it would be beneficial to carry out further research into 'internal' users of podcasts. A more up-to-date study may find more similarities with the 'external' participants in this study due to the advances in mobile technologies, smartphone ownership and familiarity with the technology.

Finally, mobile learning research and evaluation methods evolve together with developments in mobile learning (Kukulska-Hulme, 2010). It will be therefore necessary to consider which research methods will be most appropriate to research of this type with mobile learners.

Conclusion

We have argued for the need for further information about users of podcasting and their practices to determine whether podcasting can be considered a mobile technology. By presenting the findings of the first large-scale research

study into the use of iTunes U for learning and teaching, this paper has presented differences and similarities among mobile and static device users. The users and practices reported differ from previous literature into podcasting and in particular its use with mobile devices. By approaching this research from the starting point of the platform rather than a particular educational context, access has been gained to a wider range of users whose behaviours and motivations had not been investigated before. It is not the intention of this paper to challenge the validity or applicability of previous research, mostly carried out in the context of VLE-delivered resources for 'internal' learners, but to question its generalizability outside the contexts where it was carried out.

We have argued that formal learners have practices different to those of casual or informal learners, more likely to use the mobile potential of podcasts. It is the case that formal learners are being directed to material that's further than from the definition of podcasting (lack of RSS use, distributed through an aggregator) than the materials that casual learners find. Many previous papers arrived at the conclusion that podcasting was supplementary to other learning. This is not surprising since in many of the research projects it was used as supplementary learning.

Researchers have so far focused either in the use of one podcast (in many cases the one provided by the researcher) or the possibility of using podcasting in isolation as the only learning medium. Whilst it may be the case that some learners might do this, this is no more useful that looking at a single book, CD or mobile app as a single learning solution to learning a subject. Podcasting is in many cases part of a suite of tools that a learner will use as part of their lifelong learning activity - if they look at their learning not as passing a course but as something they're committed to. The suite may or may not include other tools, but if learners download podcasts, they may well use a range of podcasts, from different sources and ranging in teaching style, quality and content. These will in most cases be self-selected and whether consciously or subconsciously be selected because of the users' own learning style, and what they perceive to be the gaps in their knowledge. This is linked to the development of the users' mobile information literacy, and their ability to find and evaluate resources appropriate to their level of learning and how, when and where to use them making use of static or mobile devices.

With the launch of the iTunes U app, the vast collections of teaching and learning resources available on the iTunes U repository is mobile too, giving users the capability to download directly on many smartphones and tablets. But is mobile learning the same as learning from a mobile device? The concept of mobility used to be centred on the issue of location. Later, it focused more on devices. For example, some mobile apps designed specifically for smartphones do not work on or have equivalent software available for desktop computers. The iPad and tablet computers in general bridge the differences between devices and the lines between desktop and portable blurs even more. As VLEs are adapted for mobile devices this is even more the case, and perhaps the differences in delivery medium that have caused such different practices among podcast users will disappear.

Is using a mobile device for learning the same as mobile learning? Some researchers have pondered whether mobile learning needs to move (e.g. Boy and Motteram, 2013). There is an assumption that ‘mobile’ means ‘out and about’. It could be that users utilise mobile devices as their preferred mode to access content, regardless of their location, as seems to be the trend with television catch up services (Williams, 2013). Mobile devices can provide ubiquitous connectivity, and location may not be a meaningful factor.

Is podcasting mobile learning? Following the definition of mobile learning provided in the introduction as learning that takes place when the learner is not on a fixed location or when the learner makes use of a mobile technology (Kukulska-Hulme, 2005), the answer is that it can be, as podcasting technology (including iTunes U) affords both those conditions. Just like radio can be listened to at home or on the go. Just like television is becoming more mobile with the use of catch up services and streaming directly to mobile devices. The key is that the affordance to provide access to learning anywhere anytime is available and a large proportion of learners use it whilst being mobile, not whether it has to be used in such a way.

Acknowledgements: Thank you to Ben Hawkridge and Peter Scott at the Open University Knowledge Media Institute for their help in placing the link to the survey on all iTunes U at the OU pages and for the provision of download data.

7 References

Abdous, M., Facer, B.R. & Yen, C. (2012). Academic effectiveness of podcasting: a comparative study of integrated versus supplemental use of podcasting in second language classes. *Computers and Education*, 58, 43–52. DOI: 10.1016/j.compedu.2011.08.021

Apple. (2013). *iTunes U Content Tops One Billion Downloads* [press release]. Retrieved from http://www.apple.com/pr/library/2013/02/28iTunes-U-Content-Tops-One-Billion-Downloads.html

Belanger, Y. (2005) *Duke University iPod First-Year Experience Final Evaluation Report. Duke Center for Instructional Technology*. Retrieved from http://cit.duke.edu/pdf/*iPod*_initiative_04_05.pdf

Bell, D. (2008) The university in your pocket. In Salmon, G. & Edirisingha, P. (eds.) *Podcasting for Learning in Universities* (178-187). Milton Keynes, U.K.: Open University Press.

Bennett, E. (2008) Using supplementary podcasts to enhance campus-based courses: students' perceptions and usage. *Learning Technology Newsletter*, 10 (3), 6-9.

Blaisdell, M. (2006) Academic MP3s >> Is it Time Yet? *Campus Technology*. Retrieved from http://campustechnology.com/Articles/2006/02/SPECIAL-DOUBLE-FEATURE-Academic-MP3s-Is-It-Time-Yet.aspx?sc_lang=en&p=1

Bolliger, D.U., Supanakorn, S. & Boggs, C., (2010) Impact of podcasting on student motivation in the online learning environment. *Computers and Education*, 55, 714–722. DOI: 10.1016/j.compedu.2010.03.004

Boy, I., & Motteram, G. (2013, July). *Does mobile learning need to move?*. Paper presented at WorldCALL conference: Global perspectives on Computer-Assisted Language Learning. Glasgow, United Kingdom. 10-13 July 2013, 32-35. Retrieved from www.arts.ulster.ac.uk/worldcall2013/userfiles/file/worldcallv14.pdf

Bradley, C., & Holley, D. (2011). Empirical Research into Students' Mobile Phones and their Use for Learning. *International Journal of Mobile and Blended Learning (IJMBL)*, *3*(4), 38-53.

Campbell, G. (2005) There's something in the air: Podcasting in education. *Educause Review* November / December 2005. 32-46. Retrieved from http://www.educause.edu/ir/library/pdf/erm0561.pdf

Carvalho, A. A. A., Aguiar, C., & Maciel, R. (2009). A taxonomy of podcasts and its application to higher education. Retrieved from http://repositorium.sdum.uminho.pt/bitstream/1822/10040/1/Carvalho%20et%20al%20-ALT-C%202009.pdf

Cebeci, Z., & Tekdal, M. (2006). Using podcasts as audio learning objects. *Interdisciplinary Journal of Knowledge and Learning Objects*, 2, 7–57.

Clarebout, G., Coens, J., & Elen, J. (2008). The use of ipods in education: The case of multi-tasking. In *Beyond knowledge: The legacy of competence* (pp. 75-82). Springer Netherlands.

Clark, D. & Walsh, S. (2004) iPod-learning. Epic White paper. Retrieved from http://www.epic.co.uk/content/resources/white_papers/*iPod*.htm

Coens, J., Degryse, E., Senecaut, M. P., Cottyn, J., & Clarebout, G. (2011). Listening to an Educational Podcast While Walking or Jogging: Can Students Really Multitask?. *International Journal of Mobile and Blended Learning (IJMBL)*, *3*(3), 23-33.

Copley, J. (2007) audio and video podcasts of lectures for campus-based students: production and evaluation of student use. *Innovations in Education and Teaching International*, 44 (4), 387-399. DOI: 10.1080/14703290701602805

Dahlstrom, E. (2012). *ECAR Study of Undergraduate Students and Information Technology*, 2012, Louisville, CO. Educause Center for Applied Research. http,//www. educause. edu/ecar.

Daniel, D.B., & Woody, W.D. (2010) They hear, but do not listen: Retention for podcasted material in a classroom context. *Teaching of Psychology*, 37,199-203. DOI: 10.1080/00986283.2010.488542

Dias, J., Pagel, J., Browne, C., & Menish, M. (2007). *Student and Teacher Collaboration on Podcasts*, Paper presented at the EUROCALL 2007 Conference, University of Ulster, Coleraine, Northern Ireland, September 6, 2007.

Diehl, W. C. (2013). M-Learning as a Subfield of Open and Distance Education. In Berge, Z. L., & Muilenburg, L. (Eds.). *Handbook of Mobile Education*. Routledge, 15-23.

Doolittle, P. E., & Mariano, G. J. (2008). Working memory capacity and mobile multimedia learning environments: Individual differences in learning while mobile. Journal of educational multimedia and hypermedia, 17(4), 511-530.

Edirisingha, P. & Salmon, G. (2007) Pedagogical models for podcasts in higher education. Retrieved from https://lra.le.ac.uk/bitstream/2381/405/1/Pedagogical%20models%20for%20podcasts%20in%20higher%20education%20-%20conference%20paper.pdf

Evans, C. (2008). The effectiveness of m-learning in the form of podcast revision lectures in higher education. *Computers and Education*, 50(2), 491–498. DOI :10.1016/j.compedu.2007.09.016

Fernandez, V., Simo, P., & Sallan, J.M. (2009) Podcasting: a new technological tool to facilitate good practice in higher education. *Computers and Education*, 53, 385–392. DOI: 10.1016/j.compedu.2009.02.014

Godwin-Jones, R. (2011). Emerging technologies: Mobile apps for language learning. *Language Learning & Technology*, *15*(2), 2-11.

Hamm, S. E., Drysdale, J., & Moore, D. (2014). Towards a Mobile Learning Pedagogy. In D. McConatha, C. Penny, J. Schugar, & D. Bolton (Eds.) *Mobile Pedagogy and Perspectives on Teaching and Learning* (pp. 1-19). Hershey, PA: Information Science Reference. doi:10.4018/978-1-4666-4333-8.ch001
Heilesen, S.B. (2010) What is the academic efficacy of podcasting? *Computers & Education*, 55, 1063-1068. DOI: 10.1016/j.compedu.2010.05.002

Hürst, W., Welte, M. & Jung, S. (2007) An evaluation of the mobile usage of e-lecture podcasts. In *Proceedings of the 4th international conference on mobile technology, applications and systems and the 1st international symposium on computer human interaction in mobile technology* (pp. 16-23). Singapore: ACM.

Kazlauskas, A., & Robinson, K. (2012). Podcasts are not for everyone. *British Journal of Educational Technology*, *43*(2), 321-330.

Kenning, M-M. (2007). *ICT and Language Learning: From Print to the Mobile Phone*. Houndmills: Palgrave Macmillan.

Kukulska-Hulme, A. (2005) Introduction. In A. Kukulska-Hulme & J. Traxler (Eds.) *Mobile Learning: A Handbook for Educators and Trainers*, Routledge, London.

Kukulska-Hulme, A. & Traxler, J. (2005) Mobile teaching and learning. In A. Kukulska-Hulme & J. Traxler (Eds.) *Mobile Learning: A Handbook for Educators and Trainers*, Routledge, London.

Kukulska-Hulme, A. (2010). Mobile learning as a catalyst for change. *Open Learning*, *25*(3), 181-185.

Kukulska-Hulme, A. (2013). Mobile learners: who are they and who will they become? In Berge, Z. L., & Muilenburg, L. (Eds.) *Handbook of Mobile Education*. Routledge, 145-154.

Kukulska-Hulme, A., Pettit, J., Bradley, L., Carvalho, A. A., Herrington, A., Kennedy, D. M., & Walker, A. (Eds.). Mature students using mobile devices in life and learning. *International Journal of Mobile and Blended Learning*, *3*(1), 18-52.

Lee, M. J. W. & Chan, A. (2007) Pervasive, lifestyle-integrated mobile learning for distance learners: an analysis and unexpected results from a podcasting study, *Open Learning* (22), 201-218. DOI: 10.1080/02680510701619810

Lee, M. J. W., Miller, C., & Newham, L. (2009) Podcasting syndication services and university students: why don't they subscribe? *The Internet and Higher education*,12(1), 53-59. DOI: :10.1016/j.iheduc.2008.10.001

McCarty, S. (2005) Spoken Internet to Go: Popularization through Podcasting. *JALT CALL Journal*, 1 (2), 67-74.

McKinney, D., Dyck, J.L., & Luber, E.S. (2009).iTunes University and the classroom: Can podcasts replace professors? *Computers & Education*, 52,617-623. DOI: 10.1016/j.compedu.2008.11.004

Malan, D. (2007). Podcasting Computer Science E-1, SIGCSE'07, March 7–10, 2007, Covington, Kentucky, USA.

Naismith, L., Lonsdale, P., Vavoula, G. & Sharples, M. (2005) Literature Review in Mobile Technologies and Learning. A Report for NESTA Futurelab. Retrieved 27th April, 2006 from http://www.futurelab.org.uk/download/pdfs/research/lit_reviews/futurelab_review_11.pdf

O'Bannon, B. W., Lubke, J. K., Beard, J. L., & Britt, V. G. (2011). Using podcasts to replace lecture: Effects on student achievement. *Computers & Education*, 57(3), 1885–1892. DOI: 10.1016/j.compedu.2011.04.001

Ofcom (2011): *A nation addicted to smartphones*. Retrieved from http://consumers.ofcom.org.uk/2011/08/a-nation-addicted-to-smartphones/

Rosell-Aguilar, F. (2013a). Delivering unprecedented access to learning through podcasting as OER, but who's listening? A profile of the external iTunes U user. *Computers & Education*.

Rosell-Aguilar, F. (2013b). Podcasting for language learning through iTunes U: the learner's view. *Language Learning & Technology*, *17*(3),74-93. Retrieved from http://llt.msu.edu/issues/october2013/rosellaguilar.pdf

Salmon, G. & Edirisingha, P. (2008) *Podcasting for Learning in Universities*. Milton Keynes, U.K.: Open University Press.

Stockwell, G. (2013). Tracking learner usage of mobile phones for language learning outside of the classroom. In P. Hubbard, M. Schultz, & B. Smith (Eds), *Human-computer interaction in language learning: Studies in honor of Robert Fischer. CALICO Monograph Series* (pp. 118-136). San Marcos, TX: CALICO.

Stone, L. (2009). Continuous partial attention. *Lindastone. net. Nov*. http://lindastone.net/qa/continuous-partial-attention/

Traxler, J. (2011). Research Essay: Mobile Learning. *International Journal of Mobile and Blended Learning (IJMBL)*, *3*(2), 57-67.

Walls, S. M., Kucsera, J. V., Walker, J. D., Acee, T. W., McVaugh, N. K. & Robinson, D. H.(2010). Podcasting in education: Are students as ready and eager as we think they are? *Computers and Education*, 54(2), 371–378. DOI: 10.1016/j.compedu.2009.08.018

Williams, C. (2013, October 24) BBC iPlayer viewers abandon computers for smartphones and tablets. *The Telegraph*.
Retrieved from:
http://www.telegraph.co.uk/finance/newsbysector/mediatechnologyandtelecoms/digital-media/10401398/BBC-iPlayer-viewers-abandon-computers-for-smartphones-and-tablets.html