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Some Preliminary Findings for Designing Educational Podcasts

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Abstract : *In recent years, the advancements in mobile technologies leaded to an enormous increase in mobile learning (m-learning) researches and applications in education. As an m-learning technology, podcasting is an audio learning material delivery method that offers a flexible learning option either inside and/or outside schools. In spite of podcasting have many advantages for m-learning there is also a need for using this technology in a more beneficial and effective way in teaching and learning. In this paper, as a spesific domain example, the use of podcasting in agricultural education was surveyed and analyzed from the point of view of undergraduate students' perceptions and experiences. The findings showed that learning by podcasting can be applied in agriculture and related disciplines, successfully. In this paper, also some suggestions was made for podcasting design and delivery based on students' opinions for podcasting.*

Keywords*: podcasting, audiocasting, m-learning, e-learning, technology enhanced learning*

Introduction

In recent years many advances such as the exponential growth in mobile technologies, the popularity of professional digital devices and the developments in cabled and wireless network infrastructure have been created new accessibility opportunities for teaching and learning. The potential for everywhere and everytime learning is actually started to realize with these advancements (Kinshuk, 2003). Mobile technologies do not only include cellular phones but all devices either they are cabled and wireless. These devices are intelligent phones, digital-interactive TVs, PVRs, iPods, mp3 players and other ubiquitous technologies.

Podcasting or audiocasting (as a more neutral and general term) can be defined as a kind of audio content delivery to the mobile devices via the syndication techniques such as RSS and Atom (Cebeci and Tekdal, 2005). In the past, however, podcasting has initially been used to publish audio records in mp3 format for non-educational purposes, today it is also applied for educational purposes as a new tool of e-learning. Podcasting offers some superior advantages over other content delivery methods requiring online sessions, i.e. video-audio streaming technologies such as VoD. Since podcasts are stored in mobile devices (mainly mp3 players, 3G phones, PDAs and mobile computers) after downloading from the podcasting site on the Web, the learning resources can be transferred to anywhere, and listened in anytime by learners without an online network connection (Cebeci and Tekdal, 2005).

Although we know what kind of advantages we have by podcasting in education we still need the researches and applications, this technology puts into operation in education. According to Naismith et al (2004) "Usability should account for both the set of users that will be creating the mobile content and those who will be using the mobile applications to learn from or teach with." Therefore, in this paper, the use of podcasting in agricultural education was evaluated on undergraduate students' perceptions and their computer literacy levels in an

agricultural faculty in Turkey. In the paper, the preparedness, willingness and expectations of agricultural students for podcasting was analyzed and discussed effective design of learning podcasts for courses taught in agricultural faculty.

Material and Method

The data used in this study were obtained from a survey study carried out at the Faculty of Agriculture at the Çukurova University, located in Adana, Turkey in 2005. Only freshman students were surveyed because we planned to use educational podcasting of the introductory courses given in the first year of agricultural curriculum of the faculty.

The survey was responded by 124 students. 105 of students were male (84.7%) and 19 of them were female (15.3%). The age of the students range from minimum 18 to maximum 30 years, and the mean age was 20.19±0.19 (median 20.0). While 57.3% of the students' families were living in a city center, 29.8% and 12.9% of the families were living in a district town and rural areas, respectively.

For having an idea to interpret the findings we have asked for some demographic data about the students. Monthly family income of our students were mostly below 1000 YTL (64.5%), and nearly two-third of the families (35.5%) had an income over 1000 YTL per month. While personal expenditures of the students were changing 50 YTL and 850 YTL per month its mean was 275 YTL (median 250 YTL). The students who come from the city in where the university is located were living with their families (29%), the remaining who come from other cities and rural areas have preferred to stay at student dormitories (39.5%), at rented flats (26.6%) and at hotels, guesthouses or other accommodations (4.8%).

In this study the survey questions were asked as open-ended, yes-no, single- and multiple-choices questions. The data were analyzed for obtaining descriptive statistics and testing with SPSS Ver 9. Pearson Chi-squared test (χ^2) was used to test independencies of variables. For testing the differences between the answer groups of a specific question goodness-of-fit test was applied.

Results and Discussions

Use of mp3 players

However one fourth of students (25.8%) have an mp3 player, majority of the students (62.9%) who do not have a device has expressed that they plan to buy one in near future. As it is seen in Table 1, these findings show that although the students have idea/knowledge enough about mp3 players and its advantages. They expressed that owning a device depends on their income levels mainly. Indeed, as we understand from the figures shown in Table 2 it is clear that a major part of the students can only pay 135 YTL for a device. While a major part of students (41.9%) answered that they could buy if maximum price of an mp3 player is 100 YTL, and the others can pay more than 150 YTL for a device. These limits show us that majority of the students can buy an mp3

player. Moreover they have already one because of tremendous decreases in the price of mp3 players since 2005, this survey was applied (in 2 years).

Table 1. Ownership and uses of mp3 players

Mp3 players ownership	Frequency n (%)
Yes	32 (25,8)
No	92 (74,2)
Experienced to use an mp3 player	61 (66,3)
Never used an mp3 player	31 (33,7)
Plans to buy an mp3 player	78 (84,7)
Do not plan to buy an mp3 player	14 (11,3)
Total	124 (100,0)

Table 2. Payable amount for an mp3 player

Descriptive statistics	Price range (YTL*)	Frequency n (%)
	-100	52 (41,9)
	101-150	21 (16,9)
	151-200	11 (8,8)
	201-250	6 (4,8)
	251-300	8 (6,5)
Mean: 169,77	301-350	2 (1,6)
Std.Error: 13,94	351+	9 (7,3)
Median: 135,00	Not	
Min: 15,00	responded	15 (12,1)
Max: 800,00	Total	124 (100,0)

* 1 YTL=0,8 $US

According to the results given in Table 3, the main usage of mp3 players was to listen to music (86.2%) as it is expected. While a very small number of students (3.2%) uses their mp3 players to listen to podcasts only, a relatively high number of students (10.4%) see that mp3 players can be used to listen music and podcasts. This low usage rate of mp3 players for podcasting was probably due to unfamiliarity of podcasting and/or the low capacity of the players owning by the students at time of survey.

The audio content in an mp3 player can be listened in any place and anytime even during walking, driving, traveling, shopping etc. This means that learning can actually be practiced in anywhere and any time as it has been mentioned for the years. However the findings given in Table 4 show that the players are mostly listened at home only (37.1%). This high percentage of the use mp3 players is followed by driving + traveling (16.9%). 17.7% of the students was correctly and perfectly evaluated that mp3 players can be used anywhere. Majority of the students (87.1%) expressed that it may be very helpful if they follow the audio records of speech-weighted lectures in Internet. On the other hand a few students (7.3%) responded that audio records of lectures will not contribute to their learning too much, and even a small number of students (5.6%) had no any opinion. However they did not experience any audio learning before the survey applied, only a small part of the students (13.7%) had an idea and experience about learning by audio tools.

Table 3. Uses of mp3 players

Purpose of the use	Frequency n (%)
Listen to music only	82 (66,1)
Listen to radio only	2 (1,6)
Listen to podcasts only	4 (3,2)
Listen to music + radio	16 (12,9)
Listen to music + podcast	4 (3,2)
All kinds of audio	5 (4,0)
Not responded	11 (8,9)
Total	124 (100,0)

(χ^2: 262,133; df: 5; p<0,001)

Table 4. Places where mp3 players used

Place	Frequency n (%)
At home	41 (33,1)
In cafes, fastfoods etc	2 (1,6)
During a travel by a motor vehicle	13 (10,5)
During walking, making sports	5 (4,0)
All places	22 (17,7)
Home + Driving	5 (4,0)
Home + Entertainment place	2 (1,6)
Home + Walkings + Sporting	3 (2,4)
Not responded	33 (26,6)
Total	124 (100,0)

(χ^2: 218,857; df: 7; p<0,001)

In many research works it has been concluded that the student-blogs for m-learning can improve and promote m-learning by podcasting (Savill-Smith& Kent, 2003). Additionally it was also suggested that the games and game based learning will accelerate the penetration of e-learning into educational arena. In our study we obtained that the students know little about the blogs. While a few students (8.9%) expressed that they read weblogs (or shortly blogs), majority of them did not visit any blog site. Even 8.1% of students reported that they have never heard “blog” word yet. Coming to audio-blogs (or audilogs) only 2 students have answered that they subscribed to an audilog , and 14.5% of them expressed that they had no idea about audiologs and podcasting. The results show that only a small part of students (16.9%) owns iPod and/or iPod-like mp3 players. Only two students (1.6%) responded that they had an iPod device and knowledge how to use podcasts.

Educational Findings

In the faculty in which the survey applied, the lecturing duration is 45 minutes. The results obtained from our survey indicated that keeping attention for listening the lectures was statistically significant factor in learning process (p<0.001). As it is seen from Table 5 more than half of students (53.1%) responded that they can lose their attention after 20 minutes. While there were students (6.5%) keeping their attention for 45 minutes (entire duration of lesson) there were students loss their attentions just in 5 minutes too (2.4%). According to Keller’s

motivational ARCS model, attention is one of the four key factors in a successful learning and teaching (Keller, 1987). Therefore the success rates for learning has to be increased with special considerations on paying attention, active participation, individual learning differences, learning styles, humor, special examples, asking questions in the lectures as well as in producing m-learning materials.

The length of a podcast is a key factor in keeping attention of learners. It depends on some technical and educational factors varying from the storage size of mp3 players to bandwidth available in connection to Internet (Cebeci and Tekdal, 2006). In general, the ideas on ideal length of a podcast have been intensified on type and popularity of the audio content provided in it, it should be evaluated through the educational approaches at first. Although the length of a podcast may not be concerned as an important condition for podcasts that will be prepared for informal education, we should try to find the optimal size for any educational podcast in order to keep listeners' attention and understanding as long as we can do.

Plummer (2006) found that the podcasts of 10-15 minutes are preferred by the students who enrolled in Environmental Management and Garden Design programme in Australia. Plummer also argued that the students surveyed wish to download a learning podcast very quickly and listen it in a short time. In a research carried out in Charles Sturt University, Long (2007) explained that ideal length of podcasts can be varied between 3 and 30 minutes. Long also suggested that splitting long audio records into short segments will be more efficient in learning process when it is compared to long ones. In a survey study applied in Canada it was reported that 21% of 1000 responders wishes to listen to 6-10 minutes podcasts, and 32% of them prefer to listen 11-30 minutes podcasts. The percentage of responders who wish 60 minutes or longer podcasts was very low as 2% (Sequentia and Caprica, 2006). Finally a 15-20 minutes presentation length is a common application as a speech duration in scientific events. The student opinions in this survey pointed that the length of a podcast should be 15 to 25 minutes as suggested by Cebeci and Tekdal (2006).

The students dominantly (66,9%) wish to learn the speech-weighted courses in a blended learning (b-learning) mode that combining face-to-face and distance e-learning methods together .As it is shown in Table 6, 16.1% of the students want to learn in classrooms only. Again almost same proportion of the students (16.9%) prefers to learn with mp3 files by downloading recorded lectures in the Internet.

Table 5. Duration of keeping attention in lectures

Attention keeping in listening	Frequency n (%)
First 5 minutes	3 (2,4)
First 10 minutes	5 (4,0)
First 15 minutes	23 (18,5)
First 20 minutes	35 (28,2)
First 25 minutes	29 (23,4)
First 30 minutes	21 (16,9)
First 45 minutes (whole lecture)	8 (6,5)
Total	124 (100,0)
Mean (median): 20 minutes	

(χ^2: 52,919; df: 6; p<0,001)

Table 6. Learning methods for speech-weighted courses

Preferred method	Frequency n (%)
All face-to-face (in classrooms) only	20 (16,1)
Downloading and listening audio records of lectures (mp3, vaw etc)	21 (16,9)
Face-to-face + Internet (Web, mp3 etc) = b-learning	83 (66,9)
Total	124 (100,0)

(χ^2: 63,016; df: 2; p<0,001)

In many researches it has been concluded that the delivery of audio records of the courses will support and improve learning outcomes by providing anywhere and anytime learning possibilities to the learners. This can be done with real-time broadcasting of live lessons or asynchronous broadcasting after a post-production to increase the learners' attention during listening. Cebeci and Tekdal (2006) suggested that any recorded audio can be improved as it is converted to an audio learning object format. With a method called Wafers-Like Audio Learning Object (WALO) educational quality of an audio content can be refined by adding/mixing related funs, music into it. WALOs is a way of object presentation style, better than traditional speech only content audios. The results obtained in our survey support this idea once again. As it is shown in Table 7, although the students responded that they like WALO type audios, their preferences regarding the mixed materials were statistically different among them (p<0,001). Except only one, all students said that they wish to listen to enhanced and/or mixed content rather than listen to only simple recorded speech-weighted audios.

In preparing podcasts for audio courses the students reported that they mostly like jokes, humor and/or talk show-like presentations in their podcasts (26.6%). This is followed by teacher-students conversations (25.8%), daily news and announcements (18.5%) and music fragments (18.5%) (See Table 7). Since we have assumed that the students will dominantly prefer to listen to music in their podcasts we asked for the types of music which may be inserted into lecture speeches. Contrarily the results showed that our pre-assumption was not true. Sharples et al (2002) pointed that the conversations between human learners contribute to learning and should be taken into consideration in learning design.

Table 7. Non-lecture content types to insert into podcasts

Content type	Frequency n (%)
Teacher-classmates dialogs	32 (25,8)
Jokes, talkshows-like speeches	33 (26,6)
Daily news and events	23 (18,5)
Rock/popular music	9 (7,3)
Instrumental music	3 (2,4)
Classical music	4 (3,2)
Folk music	7 (5,6)
Magazine news	3 (2,4)
Scientific/Encyclopedic knowledge	4 (3,2)
Local news & announcements	5 (4,0)
Only talks by teacher	1 (0,8)
Total	124 (100,0)

(χ^2: 128,645; df: 10; p<0,001)

Table 8. Talking people prefered for podcasts

Choices	Frekans n (%)
Talks by teacher	14 (11,3)
Talks by classmates	9 (7,3)
Talks by Teacher + Classmates	38 (30,6)
Professional speakers	40 (32,3)
No idea	23 (18,5)
Total	124 (100,0)

(χ^2: 31,242; df: 4; p<0,001)

While a major part of the students (86.3%) think that psychological mode and associatively voice variations of teachers are very important, a small part of them (13.7%) believes that it is not important factor their learning performances (χ^2: 65,323; df: 1; p<0,001).

As it is shown in Table 8 the students' opinions differed for people who will speak for podcasting (p<0,001). Majority of the students (32.3%) wishes their podcasts should be prepared by professional speakers. The second choice (30.6%) was to produce the posdcasts by collective talks of classmates and teachers, and this was followed by talking by teachers only (11.3%). These findings point out that the learning podcasts should be recorded with contributions and dialogs of students in the classroom, and it is similar to the results obtained by Maag (2006).

The results in both Table 7 and Table 8 underline to produce educational podcasts as individualized or personalized resources. So anyone may listen to what you want. In other words the central podcast repositories broadcasting some uniform and/or standard podcasts for all students may not be as good as the repositories broadcasting specialized contents. In production of learning podcasts we should take into account learners'profiles and assemble the invidualized or personalized audio content according to these personal profiles. The tools needed for this kind of production and delivery have to be developed and integrated into LCMS systems for further improvements.

Conclusions

There are several methods of m-learning that differing in their delivery methods and techniques. M-learning can be applied by use of mobile devices such as cellular phones, handheld computers, laptops, palmtops, pdas, mp3 players etc. In spite of various advantages m-learning, the penetration rate of m-learning has been rather slow in the past. At the beginning of m-learning era, the first and only choice was to use Wap-based technologies for delivering educational content to learners via cellular phones. Phone based m-learning did not become successful due to mainly difficulties in use and high cost of communication etc.

Recently mp3 players and podcasting joined to the list of m-learning tools. For last 3 years, schools, e-learning experts, content developers, solution providers are focusing on developing technologies, solutions and applications based on podcasting mainly. Because the recent advances for high-capacity digital audio players in

one hand and increasing popularity of these devices by young people on the other hand made podcasting the first choice among alternative m-learning methods. In an m-learning survey carried out by eLearning Guild (Pulichino, 2006) the ranking for m-learning tools was:

- Notebooks/laptops (mobile PCs) (65%),
- Wireless mobile hand devices (PDAs) (32%),
- Smart phones (22%)

In same survey the organizations which will apply m-learning mostly plan to use iPod-like devices in their applications (54%). According to the result of this survey podcasting seems to be the first option in m-learning operated by educational and corporate organizations today. These results proved that mp3 players and podcasting will be a leading option in m-learning.

As a final conclusion podcasting can be an instance solution for organizations which plan to transfer all skills and/or lectures to their students in order to cultivate and develop knowledge transfer in a short time with small cost investments. In this survey it was found that majority of the students have got positive attitude towards m-learning, and many of them have already experiences and devices to use this technology.

References

Cebeci, Z., Tekdal, M. (2005). E-ögrenmede Yeni Bir Fırsat: Pod Yayinciligi. *22. Ulusal Bilisim Kurultayi-Bilisim Teknolojileri Isiginda Egitim. Bildiriler Kitabi* (ed. M. Askar), TBD Yayınları 24, ISBN: 975-98930-9-6. s. 133-140.[Podcasting: A new opportunity in E-learning. *Proc. of 22nd National Informatics Congress-Education under the light of Information Technology* (ed. M. Aksar). Turkish Informatics Association Publication #24, ISBN: 975-98930-9-6. pp. 133-140]

Cebeci, Z., Tekdal, M. (2006) Using Podcasts as Audio Learning Objects. *Interdisciplinary Journal of Knowledge and Learning Objects.* Vol. 2, pp. 47-57 (Retrieved from http://www.ijklo.org/Volume2/v2p047-057Cebeci.pdf on 20th Feb, 2007)

Keller, J.M. (1987). Development and use of the ARCS model of motivational design. *Journal of Instructional Development,* 10(3), 2-10.

Kinshuk. (2003). Adaptive mobile learning technologies. Globaled Articles, 4 p. Retrieved from http://www.globaled.com/articles/Kinshuk2003.pdf on 9th Apr, 2007

Long, C. (2007). Podcasting in Online Education: Promise of Pitfall. California Virtual Campus Professional Development Center Articles. (http://pdc.cvc.edu/common/article.asp?entry=1&idx=4624)

Maag, M. (2006). iPod, uPod? An emerging mobile learning tool in nursing education and students' satisfaction. Proceedings of the 23rd annual ascilite conference: Who's learning? Whose technology? ascilite 2006, The University of Sydney pp.483-492. Retrieved from http://www.ascilite.org.au/conferences/sydney06/proceeding/pdf_papers/p92.pdf on 4th Apr 2007.

Naismith, L., Lonsdale, P., Vavoula, G. & Sharples, M (2004). Literature Review in Mobile Technologies and Learning. Futurelabs Report Series 11 (ISBN: 0-9548594-1-3), 44 p. Futurelabs, UK. (Retrieved from http://www.futurelab.org.uk/download/pdfs/research/lit_reviews/futurelab_review_11.pdf on 4th Mar, 2007).

Sharples, M., Corlett, D. & Westmancott, O. (2002) The Design and Implementation of a Mobile Learning Resource. Personal and Ubiquitous Computing, 6, pp. 220-234. Retrieved from http://www.eee.bham.ac.uk/sharplem/Papers/mobile%20learning%20puc.pdf on 20th Feb 2007)

Plummer J. (2006). Time shifting Time - Podvocation: What it is and why you should care*? The Knowledge Tree: an E-journal of Learning and Innovation* by Australian Flexible Learning Framework (ISSN: 1448 2673), Going Aural, Edition 10, pp.16-26. Retrieved from http://kt.flexiblelearning.net.au/wp-content/uploads/2006/07/plummer.pdf on 4th Mar, 2007.

Sequentia & Caprica (2006). 2006 Canadian Podcast Listeners Survey. 28 p. http://www.canadianpodcastlistenerssurvey.ca/docs/canadianPodcastListeningReport_final_2006Jul26.pdf

Pulichino, J. (2006). Mobile Learning Research Report 2006-The Elearning Guild Research. 18 p. (http://www.elearningguild.com/pdf/1/july_2006_-_mobilelearning.pdf on 4th Mar 2007)

Cebeci, Z. (2008). Some preliminary findings for designing educational podcasts, in *Proc. 2nd Int. Conference On Innovations in Learning for the Future 2008:e-Learning,* March 27-29th, 2008, Istanbul, Turkey, Istanbul Univ. Rectorate Publications 4793, (S. Gülsecen & Z.A. Reis, Eds), pp: 377-385.

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