

USING PODCASTS IN DISTANCE EDUCATION

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ABSTRACT

This paper discusses three possible ways of applying podcasts in distance education: podcasts of recordings of virtual classes, podcasts produced for specific pedagogical aims, and podcasts produced by external organizations. Through a survey we gained insight in the (until now limited) experiences of our distant students with podcasts, and also in their preferences for future applications in education. Findings indicate that students prefer podcasts that can make them study as efficiently as possible, such as podcasts with explanations of hard topics, illustrations of subject matter and feedback on assignments. Recorded virtual classes and podcasts with elective subject matter are less popular. It is claimed in literature that podcasts in which students can see and hear their instructor can reduce feelings of isolation and increase feelings of connectedness. There are no indications that our students have a distinct preference for such podcasts.

KEYWORDS

Distance education, podcasting, virtual class, pedagogical strategy.

1. INTRODUCTION

In recent years, the use of podcasts has increased dramatically in many fields, among them education. The most basic use in higher education is to capture live lectures in face-to-face education, and to upload them as podcasts. But podcasts can serve several other educational functions, as one can read in research studies and practitioners reports.

The focus in this paper is upon the potential use of podcasting in distance education. There are claims that podcasting can have considerable benefits for distance education students. In the cognitive domain, podcasts can be effective for clarifying and enhancing understanding of subject material, especially because it is believed that a combination of different communication media can be beneficial for the learning process of many students (Fernandez et al, 2009). Very promising, especially for distance education students, is the claim that use of podcasting also can have positive effects in the affective domain. It could reduce feelings of isolation and make students feel more connected to fellow students and instructors, and thereby increase the students' motivation (Lee & Chan, 2007).

The objective of this paper is to identify current and potential uses of educational podcasts as a medium in distance education. The results could assist educators in making decisions where and how to best use podcasting in their courses. This paper focuses specifically upon two questions:

- What are promising ways of applying podcasts in distance education?
- What are the experiences of distance education students with the current use of podcasts, and what are their expectations of potential uses?

In literature, one can find numerous reports describing experiences with educational podcasting, mainly in the context of face-to-face education. Based upon those experiences we identify in this paper a number of promising ways to use this technology in distance education. To answer the second question, we collected information from our students by distributing a survey among them. These students are enrolled in courses of the Computer Science department of the Open University of The Netherlands which offers only distance education. The survey asked the students about their experiences with the current use of educational podcasts and about their interest in potential applications of podcasts.

For a meaningful discussion about using podcasting in education, one needs a way of categorizing such podcasts. Several categorizations and taxonomies can be found in literature; see Heilesen (2010) for a discussion. As can be expected in a just emerging practice, they tend to be tentative and incomplete. In this paper we use the categorization of Figure 1. It closely resembles the one described by Hew (2009) which in turn is based upon the categorization of Rosell-Aguilar (2007). We chose this categorization, because it is suitable for our practical objective of structuring the domain from the point of view of educators who consider the use of podcast in education.

This categorization divides podcasts in two main categories: podcasts produced by instructors and external podcasts, produced by other organizations. The former is divided into two categories: lecture podcasts and podcasts developed for specific pedagogical functions, as assignment tips and post-assignment feedback. Examples of external podcasts are podcasts produced by (other) universities, by broadcasting organizations (for example, the BBC) and TED-talks.

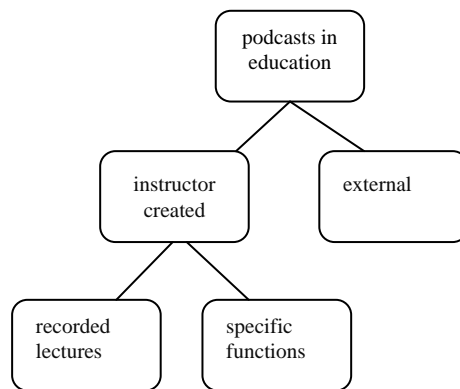


Figure 1. Categorization of podcasts (Based upon Hew (2009) and Rosell-Aguilar (2007))

We notice that this categorization (contrary to the one by Hew (2009)) does not include student-created podcasts. The reason for not discussing them in this paper is that one can find in literature hardly any experiences with student-created podcasts.

2. APPLICATIONS OF PODCASTING

In this section we present several ways of using podcasts in education, and we discuss their possible merits for distance education. We also present the students' opinions about those applications.

To learn the opinions of our students, we distributed a survey among them. The survey consisted of closed questions, with the possibility to make remarks or comments in text fields. The questions measured in the first place the respondents' interest in potential applications of podcasting. The survey also included some more general questions about podcasting. If respondents had recent experiences with educational podcasts, we asked them about these experiences. Most of them have limited or no experience at all with educational podcasts.

We announced the survey in different ways, in order to find respondents with different backgrounds and interests. It was made available on the website of the department, and we also announced it to students of several, divergent courses. 41 respondents completed the survey. All of them were students enrolled in courses of the department of Computer Science.

The subsections are arranged according to the categorization of Figure 1. Therefore we present and discuss in succession: the use of recorded lectures, the use of podcasts with specific educational functions and the use of externally produced podcasts.

2.1 Recorded Lectures

The most common application of podcasting in face-to-face education is to capture lectures and make them available online for students. The benefits of such podcasts are well-documented and broadly recognized (Abdous et al., 2012; Heilesen, 2010; Jowitt, 2008). Students use these podcasts for the purpose of reviewing concepts and issues presented during lectures. There is clear consensus in literature that podcasting is extremely effective as a revision tool. Evans (2008) found for example that students perceive podcasting as a more effective revision tool than textbooks, and consider it to be more efficient than their own notes. Most popular among students is to use these podcasts just before the exams, as a kind of check whether they understood the subject matter. According to the students, this use of podcasts has several benefits compared to the face-to-face lecture, among them the ability to repeatedly access the same content and the ability to listen whenever and wherever they like (Jowitt, 2009). Another finding is that students see such podcasts as additional resources rather than as a substitute for lectures and written course materials (Abdous et al., 2012)

Podcasts in the form of recorded lectures can also be used in distance education. In our distance education university we offer synchronous virtual classes (using Elluminate) for many courses. These classes have a structure similar to face-to-face classes. The instructor gives mini lectures, introduces assignments and solves them in interaction with a group of students. Usually a group consists of about 10 or 15 students. These sessions are recorded and are available for all students who are enrolled in the course. Students who attended the virtual class can (re)view them, but also students who did not attend the class.

We asked our students about their experiences with these recorded virtual classes. Table 1 gives the results. The number of respondents is 28, because not all respondents had experiences with courses using virtual classes.

Table 1. Use of recorded virtual classes (N = 28)

Did you watch recordings of virtual classes?	
Seldom or never (< 10%)	25 %
Sometimes (about 25 %)	25 %
Regularly (about 50 %)	11 %
Almost always (75 % or more)	39 %

We asked the students about their interest for potential uses of podcasts in our courses, whether they had experience with these uses or not. Table 2 gives the results. Entries 7 and 11 are relevant for the purpose of this section; they present the students' interest for recorded virtual and recorded face-to-face classes.

Table 2. Interest for ways of using podcasts in courses in order of preference (10 pt scale)

#	Topics	Mean
1	additional explanations of hard topics	8.2
2	illustrations and examples of subject matter	7.4
3	how-to-do instructions (as using tools, giving presentation, and so on)	7.4
4	guest speakers (for example famous experts)	7.3
5	feedback on assignments	7.2
6	survey of subject matter	6.9
7	recorded virtual classes	6.5
8	motivations why topics are relevant	6.5
9	discussions between experts	6.4
10	elective subject matter	6.2
11	recorded face-to-face classes	5.9

2.2 Specific Pedagogical Functions

In the previous section, we discussed the reuse of recordings of virtual classes. Such recordings can be seen as a documentation of classes and as an extension of the practice of providing electronic versions of slides. They are a kind of side effect of giving a class. But instructors can also produce podcasts deliberately as a pedagogical tool, with a focus upon specific pedagogical functions and specific educational contexts.

We discuss some possible applications of this kind of podcasting in distance education. They are largely based upon experiences in face-to-face education.

- Podcasts can be used for structuring the study, to prepare students for the core learning activities. For example, Fernandez et al. (2009) describe how short podcasts can give students a lead-in to and an outline of each chapter of a textbook, a motivation why specific topics are included, and hints for study. Such podcasts are relevant for distance education students, because they could support them in their efforts to efficiently manage their time.
- Podcasts can prepare students for examinations. For example, the instructor can look back on learning objectives, discuss previous exams and/or summarize the main topics. From studies about the use of recorded lectures in face-to-face education we know that students view these podcasts in the first place to prepare themselves for the examinations (Fernandez et al., 2009; Heilesen, 2010; Kay 2012).
- Podcasts can give additional explanations of subject matter known to be hard for students to understand. Viewing and reviewing difficult topics is also known to be a popular way of using recorded lectures (Heilesen, 2010)
- Podcasts can give feedback to students. For example instructors can review learning outcomes, comment upon electronic discussions, or give feedback to assignments. Offering feedback by podcasts might give students a more precise and detailed understanding of the teachers' comments than offering feedback face-to-face (Heilesen, 2010). Moreover, podcasts can be viewed repeatedly, which is a substantial advantage compared to face-to-face feedback (Elliot et al., 2009).
- Podcasts can offer interviews, for example with experts in a specific field, writers of textbooks, or with different stakeholders in student projects, as clients and users in real-world projects.
- Podcasts can explicitly be meant to promote students to be active while learning. Students tend to view educational podcasts in a relatively passive manner, which has been denoted as receptive viewing (Kay, 2012). It is therefore a challenge to find ways to use podcasts to promote active student engagement, especially in distance education (Abdous et al., 2012). One of the possibilities is to adapt a common practice in face-to-face classes: to alternate mini-lectures and student activities. In distance education, the mini-lectures of the instructor can be replaced by podcasts covering the same subject matter. To persuade students to become active, each of these podcasts could result in an explicit invitation to solve an assignment or to start discussions about the subject matter. There are other examples of the use of podcasts in face-to-face education to promote student activity that possibly can be adapted to distance education. One of them is the use of podcasts in step-by-step procedures to solve specific problems, for example in mathematics (Kay & Kletskin, 2012). Another is the use of podcasts in the 'inverted classroom', in which all in-class lecturing is replaced by podcasts and class hours are used for student activities (Heilesen, 2010).

In the survey we asked the students to score their interest in podcasts with the following functions:

- survey of learning unit
- additional explanation of hard topics
- illustrations and examples
- feedback on assignments
- motivation of importance of subject matter.

Table 2 gives the results in entries 1, 2, 5, 6 and 8.

We conclude this section with two observations. First, many of the pedagogical functions mentioned can also be realized with other media, for example with texts only. But Fernandez et al. (2009) report that students believed that a combination of different communication/learning media (voice, text, pictures, etc.) could improve the results of their learning processes, because they allow students to learn in different ways.

It has been claimed and suggested that podcasts can not only have benefits in the cognitive domain, but also in the affective domain (Kay, 2012). An interesting example is using podcasts that are produced by the actual instructor of a course. By viewing these podcasts students see and hear their instructors, which could add to the feeling of proximity and presence of the instructors. For distance education students this might be a very interesting feature of podcasts, because it could increase students' motivation. We will discuss this topic in section 3.

2.3 External Podcasts

On the web one can find numerous potential educational resources, which can be used for all kinds of purposes. Several universities provide complete courses (Massive Online Open Courses or MOOCs), TED offers numerous interesting talks by well-known experts, YouTube and other sites offer practical how-to-do podcasts. There are resources that can be linked directly to specific subject matter and learning goals, other resources can be used to motivate and inspire students. Examples of the second category in the domain of Computer Science are well-known monologues of Steve Jobs and Randy Pausch.

The survey asks the students to score their interest to see podcasts with

- guest speakers, for example famous experts
- relevant discussions between experts.

Table 2 gives the results; see entries 4 and 9.

A tricky point in using external podcasts is that they are licensed under different terms. The fact that a podcast is freely downloadable does not mean it can be used in any way. It can be a complex matter to find out if and how specific podcasts can be used for educational purposes.

3. FEELING PROXIMITY AND PRESENCE

Lack of interaction is a key problem for distance students. Distance education is often experienced as a lonely activity. As a result many students are confronted with motivational problems. They feel isolated and less member of a group, compared to students in face-to-face classes. They have fewer possibilities to interact with fellow students and faculty, which can decrease their motivation and enthusiasm (Lee & Chan, 2007).

A relevant question is whether instructor-made podcasts can play a role in alleviating those problems of distance education students. For example, could the ability to see and hear the instructor and fellow students increase their motivation? There are suggestions and claims that podcasting indeed can be effective in reducing feelings of isolation and in promoting a sense of belonging to a community, and therefore is able to increase distance students' motivation. Fernandez et al. (2009) provided students in an online course with podcasts of instructors presenting surveys of relevant topics. One of their major findings was that these podcasts increased the feeling of proximity between students and teachers, because students had the feeling of a permanent presence of their teachers. As a consequence, the podcasts enhanced students' motivation. In a review study Hew (2009) it is suggested that the use of podcasts could create a greater sense of rapport and intimacy, realism and motivation. Lee & Chan (2007) found that instructor-made podcasts were effective in reducing isolation-induced anxiety and in promoting a sense of inclusivity and of belonging to a learning community for distance education students.

Our survey included questions about who the students like to see in podcasts. Some of the respondents had some experience with seeing their instructor, because they had some experience with seeing their instructor, because they had viewed podcasts of virtual classes. Table 3 gives the results.

Table 3. Who do you like to see in podcasts? (5-pt scale, 1=disagree, 5=agree)

I would like to see famous experts in podcasts.	3.6
It is a plus if you can see your instructor in podcasts.	3.0
I don't care who speaks, more important is that he/she has a convincing story.	4.2

4. GENERAL QUESTIONS

The survey included some general questions about the use of podcasts. First we asked the students who watched podcasts if they proved to be useful. The response can be found in Table 4.

Table 4. Usefulness of podcasts (N=22, 5-pt scale, 1=disagree, 5 =agree)

The podcasts I watched proved to be useful.	3.6
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We asked the same students if they experienced problems using the podcasts. Table 5 gives the results.

Table 5. Experienced problems (N = 14, 5-pt scale, 1=seldom, 5=often)

Did you experience problems with podcasts?	
Could not watch podcast.	1.7
Podcast lasted too long.	2.3
Visual quality was bad.	1.6
Sound quality was bad.	1.9
Podcast had no clear relation with subject matter.	1.9

What role should podcasts play? One of the findings in face-to-face education is that students see recorded lectures not as a replacement of face-to-face lectures, but as an additional facility (Fernandez et al., 2009; Heilesen, 2010). In the survey we asked the students a similar question (Table 6).

Table 6. Role of podcasts

What role should podcasts have?	
Podcasts should introduce no new content, only same content in another way.	86 %
Podcasts might introduce new content that is not available in another form.	14 %

Finally, we asked the students if they felt the university should increase the use of podcasts in courses (Table 7).

Table 7. More podcasts? (5 pt-scale, 1 = disagree, 5 = agree)

University should increase using podcasts in courses	3.2
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5. DISCUSSION

According to the preferences that are ranked in Table 2, our students prefer podcasts that are to-the-point, and directly related to the subject matter they have to study. This holds for 4 of the 5 top rankings of Table 2: additional explanations of hard topics, illustrations or examples of subject matter, how-to-do-something demonstrations and feedback by the instructor. This preference is for many distance education students in accordance with their situation, in which family obligations, work and study compete for attention. For such students a natural tendency is to strive for tools and methods that can support them in their endeavor to study optimally and efficiently, without wasting time to superfluous activities. This preference of our students is consistent with the findings of Fernandez et al. (2009). Their study showed that one of the most important ways that podcasts helped their (distance education) students was by allowing them to efficiently manage their time. The podcasts gave them the feeling that the concepts of the course were easier to assimilate.

From the instructors' point of view, creating podcasts that are tailored to the needs of distance education students can be difficult and time consuming (Carvalho et al., 2009). A cheap and easy alternative is to record virtual classes (or face-to-face classes) and make these available as podcasts for all enrolled students. Students in our department have experiences with such podcasts. According to the survey, some of them watch these podcasts frequently, others only occasionally. From Table 2, which contains the preferences for podcasts, we can see that their interest in recorded classes is in line with their experiences. Such podcasts are appreciated by some, but by and large they don't rank high. Recorded classroom sessions are not aimed at emphasizing time on task, and Fernandez et al. (2009) suggest that that could be a reason why recorded classes do not score high among distance education students.

The benefits of recorded lectures for distance education students remain yet to be proven. Just uploading any recorded lecture might not be the best thing to do. For example, Sebastian Thrun, one of the pioneers in the field of Massive Open Online Courses (MOOCs) sees recorded lectures as deeply flawed. Lectures are in general "boring," he says, and recorded lectures are even less engaging: "You get the worst part without getting the best part." (Carr, 2012).

Maybe the use of such recordings can become more attractive if instructors adapt them slightly. One issue is the length of such podcasts. Usually a virtual class session lasts for about an hour or more, and usually several topics are covered within such a session. From literature, it is well known that students prefer short podcasts about demarcated topics. Table 5 shows that our students scored the length of the recorded virtual classes as the largest 'problem' with podcasts (although still not as a big problem). It is not possible to give an optimal length, because this presumably depends upon the subject, the presentational qualities of the speaker and the attitude of the student (Hew, 2009). But in general, podcasts of 5 or 10 minutes are popular. Therefore, it seems advisable to break up long podcasts in smaller, coherent segments. Another, more laborious adaptation, is to punctuate the short segments by on-screen exercises and quizzes. 'Peppering' students with questions might keep them active and involved with the content, while providing the kind of reinforcement that has been shown to strengthen comprehension and retention (Carr, 2012). It is a challenge to devise types of podcasts in a distance education context that stimulate students to be active.

Many students are positive about using external podcasts, for example podcasts with famous guest speakers. Such podcasts usually do not match seamlessly the subject matter of a corresponding course. To give optimal support to students that strive for maximal study efficiency it is advisable to thoughtfully integrate such external podcasts into the (other) course materials. This can be done by offering clear and exact information about what they can expect from each podcast: its length, the topic it does support, its exact relationship with the topic, and its relevance. In this way, every student can make a well informed decision whether or not to use it.

It has been claimed that podcasts can add to the feeling of proximity and presence of the instructors, which could increase student motivation. Up to now our students have not indicated they expect much of the possibility to be able to see their instructors in podcasts. This is consistent with the finding that recorded classroom sessions have not high rankings in Table 2, with the preferred uses of podcasts. But it has to be stressed that these opinions are based mainly upon expectations, not upon experiences. Practice, of course, may be different from the students' expectations.

Currently, our students see podcasts in addition to written course materials, not as a substitute of these. This is in line with one of the main findings of Fernandez et al. (2009), who found that podcasts are perceived as a complement to traditional resources of a course, not as a substitute for them.

Overall, the respondents have rather mixed opinions about the use of podcasts in education. On the question whether the university should increase using podcasts, the mean score is rather neutral (Table 7).

6. CONCLUSIONS

We distinguished three categories of applications of podcasts in (distance) education:

- podcasts of recordings of virtual classes that are made available for all students who might have an interest in them
- podcasts that are produced with a specific pedagogical function in mind, for example instructors summarizing or reviewing a topic, giving feedback or explaining hard topics
- podcasts produced by external organizations, for example guest speakers of famous universities.

We identified some topics students like to view as educational podcasts. The respondents preferred podcasts that are to-the-point, directly related to the subject matter they have to study, and that can make the difference to study efficiently. On top of the list of preferences are podcasts that are produced with a specific pedagogical function in mind. The first three are: podcasts with additional explanations of hard topics, illustrations or examples of subject matter and how-to-do-something demonstrations.

An inherent characteristic of podcasts that are tailored to the needs of students is that producing them usually is time-consuming. Instructors have limited time, and they must be effective and efficient. Therefore, they might consider using recordings of virtual classes. A cheaper alternative is to use recordings of virtual classes. But in the ranking of preferred podcasts they do not score high, perhaps because they are not enough focused upon time on task. Nonetheless, a considerable number of students appreciate such podcasts highly, so they should certainly be offered if they are available. Besides, it is possible to increase their attractiveness, for example by dividing recordings in small pieces.

Students have an interest in external podcasts. For example, many of them like to see famous experts. It is advisable when using such podcasts to give enough information about them, for example about their exact relation with the subject matter and about the length of them. Provided with such information, students can make a well informed decision whether or not to use them.

We did not find much support for the claim that podcasts can support distance students by adding to the feeling of proximity and presence of the instructors. Our students have not indicated they expect much of the possibility to be able to see their instructors in podcasts.

It has to be stressed that the opinions of the students are largely based upon expectations, not upon experiences. Practice, of course, may be different from the students' expectations. In future research, we would like to find out if the actual use of different kinds of podcasts leads to the same results.

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