

Use of vodcasting in Higher Education to improve student learning

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Abstract: - In several countries the curricula for the different degrees of the universities is changing to adapt it to the Anglo-Saxon model of four years. In this context, several degrees must reduce the hours for classroom and this affects in a higher way to some subjects. Some of them can see reduced their teaching hours even to the half. So, it is necessary to adopt some measures in order to maintain the level of the degree (it would be very difficult to increase this level in such situation of reducing a lot of teaching hours) and to take advantage of the change and adapt the subjects to the new century and technologies.

One of these measures that we can take is to use the Information and Communication Technologies (ICT) out of the classroom. In this way, we are developing a vodcast. The information in electronic form (as well as the access to this information) has very specific characteristics and the aim of all of us who make use of this information is getting the most out. Simply to prepare a text and place in cyberspace is wasting much of the potential we have at our disposal. To insert static images helps to improve the information. Accompanying text with audio enriches considerably the text. And to produce a combined video image and sound is the most comprehensive offering that can be done to anyone seeking information.

Vodcasting can be a powerful tool to use in some subjects. The generalization of this idea is not probed. But we are developing our vodcast for subjects of Mathematics of the first year of Engineering degrees and it seems that the tool is very well accepted by students.

Key-Words: - vodcasting, higher education, video podcast, vodcast, learning, educational innovation, information in electronic form, knowledge.

1 Introduction

One rapidly growing delivery method of delivering audio content online is via podcasting [18]. Through podcasting, audio content from one or more subscribed feeds can be automatically downloaded to a user's computer as it becomes available [9]. The audio file can be listened to on the user's computer, or it can be transferred to an iPod or other portable media player for listening at a time and place convenient to the user [9].

An estimated 56.8 million podcast users in the United States are expected by the end of this decade [11]. Udell [30] identifies the following contributors to the rapid growth of podcasting: pervasive Internet activity, growth in broadband Internet access, access to multimedia capable personal computers, a blur between streaming and downloading media content, and the rapid adoption of portable MP3 playback devices.

At the same time, the World Wide Web provides

an ideal medium to deliver learning material as digital content [28]. Audio, while a vastly neglected and underused teaching and learning medium, provides several educational advantages over printed media, including the ability to add clarity and meaning, motivation, emotion, intimacy, and personalization [9, 14].

Classroom material and leisure-time entertainment come through the same medium and desktop utility, intertwining a student's educational experience with other aspects of his/her life [7]. By combining podcasting with the widespread popularity of portable media players (i.e., MP3 players, music-capable mobile phones and PDAs), a vision of anytime and anyplace education will soon be realized [9].

When talking about electronic books is no longer science fiction and, indeed, different models of these devices begin to proliferate in the market; when speaking of encyclopaedia is not synonymous with large amount of paper-bound; when Internet is our first resort for finding information; when, finally, we

reached the twenty-first century, thinking that the acquisition of technical knowledge by the students (students of any level) can continue done exclusively as has been done for centuries, is a foolishness.

At a time now, surfing by Internet for finding information is part of the process of teaching and learning of our students (and teachers). A website, an article, a podcast or video are formats to which we are accustomed (or which we have to accustom to) and which naturally equate to classic textbooks. Moreover, we recognize the advantages of these new media and try to extract the best of them.

The information in electronic form (as well as the access to this information) has very specific characteristics and the aim of all of us who make use of this information is getting the most out. Simply to prepare a text and place in cyberspace is wasting much of the potential we have at our disposal.

To insert static images helps to improve the information. Accompanying text with audio enriches considerably the text. And to produce a combined video image and sound is the most comprehensive offering that can be done to anyone seeking information. That is when the idea arises to create a vodcast.

2 Podcasting as the previous step of vodcasting: overview of podcasting technologies

Gribbins describes in a concise but at the same time in a proper way the process followed by the podcasting.

Podcasting is a method of distributing audio recordings via the Internet, allowing users to subscribe to a feed of new files [33]. The podcasting process begins with the creation of content through the use of audio capturing and editing tools (i.e., a personal computer, a microphone, recording software, audio editing and compression software) [26]. Producing a podcast is recognized as the most challenging part of the process [7]. The created file (e.g., MP3 file) is then uploaded to a publicly-available webserver on the Internet. This file is referred to as one episode of a podcast.

The subscription process of podcasting relies on the use of Really Simple Syndication (RSS) technologies, which have revolutionized how consumers access web-based, dynamic information [9]. The content provider acknowledges the existence of the created file by referencing it in an RSS-enabled web site, i.e., the feed. The feed lists the locations of all episodes of a podcast, including episode publish dates, titles, and accompanying text descriptions. The

content provider posts the feed to a permanent location on a webserver, which is made known to the intended audience.

A user subscribes to a podcast by entering the permanent feed location into an aggregator program that reads RSS, such as Apple iTunes. Once subscribed, new podcast episodes are automatically delivered to the user's computer [9]. The downloaded episodes can then be played, replayed, or archived as with any other computer file [1].

Despite its name, listening to podcasts does not require an iPod or any portable player, but many aggregator programs allow content to be easily synchronized to portable devices [26]. Podcast subscriptions can be added or cancelled at any time [9], and podcast episodes remain on a user's computer until his/she deletes them [7].

Because of the automated delivery of content, podcasting is recognized as a "push technology [21]." The information provider chooses which files to offer in a feed with the subscriber automatically receiving those files. This feature differentiates it from alternative methods of distributing audio content to students (i.e., the uploading of audio files to course management systems). Alternative methods require multiple steps which cause student dissatisfaction or a lack of participation, while podcasting seamlessly delivers educational content onto students' computers via the RSS feed [24].

3 The jump to Higher Education

Shim et al. [28] suggests that podcasting should be used to "supplement class materials so that students can better understand concepts, theories, and applications that may not have been available during the class [28]." Faculty can use podcasting to share announcements, describe homework assignments, and distribute lectures to students [28]. They can be used to record and distribute news broadcasts and they can be used for student assignments and presentations [26]. Podcasting can provide access to experts through interviews [15], and faculty can use podcasting to provide feedback and evaluations of student work [31].

In a case study by Johnes [21], students who used podcasts in an Economics class reported that they found the podcasts to be "immensely helpful". A pilot study of podcasting by Chan and Lee [9] found that a series of informal, talkback radio-style audio clips, delivered in a timely fashion through podcasting, reduces the in-class anxieties of Information Technology students while also being more flexible and effective than alternative methods (i.e., websites and handouts). They found that 96% of the

respondents would be willing to listen to additional audio material made available in MPS format [9].

Podcasting offers several advantages to the learning process. Chan and Lee [9] suggest that the time-shifted aspect of podcasting is a primary benefit to education: “podcasting combines the benefits of broadcast radio with the flexibility, learner control and personalization afforded by recorded audio.” Podcasts allow for spatial and temporal flexibility by giving the listener the control of where and when to listen to files [28]. Thus, educational materials can be offered independently of time and place [33]. Recorded lectures distributed via podcast can allow students to “re-attend” class or can accommodate absent students.

Because podcasts are relatively easy to produce, publish, and access on the go [23], they enabling educators to rapidly and timely address student needs and concerns as they surface [9]. In addition, podcasts can be a significant learning aid to auditory learners [26]. For online classes, podcasts can provide a conversational voice that may enhance learning [24]. The use of technology in higher education improves student learning and diminishes the attrition of underrepresented groups of students [6].

4 Vodcast

Vodcast (sometimes called “video podcast”) is a term used for the online delivery of video on demand video clip content via Atom or RSS enclosures. The term is used to distinguish between podcasts which most commonly contain audio files and those referring to the distribution of video where the RSS feed is used as a non-linear TV channel to which consumers can subscribe using a PC, TV, set-top box, media center or mobile multimedia device. Web television series are often distributed as video podcasts.

At the beginning, the term Podcast had from its inception described the distribution of digital media files, including video and audio via RSS enclosures and hence the terms video podcast, vodcast or less commonly vidcast were redundant. But now, the term podcast is use normally for audio files and vodcast for video files.

Podcasting was creating in comparison to broadcasting, where antennas, relay stations, and TV studios were necessary. “Pod” prefix means Personal On Demand, and obviously it does not need any television studio or TV antennas.

The next natural step was the “Vod”, that is, the Video On Demand.

From a web server, a video podcast can be distributed as a file or as a stream. Streaming media

are multimedia that are constantly received by, and normally presented to, an end-user while being delivered by a streaming provider (the term “presented” is used in this article in a general sense that includes audio or video playback). The name refers to the delivery method of the medium rather than to the medium itself. The distinction is usually applied to media that are distributed over telecommunications networks, as most other delivery systems are either inherently streaming (e.g., radio, television) or inherently non-streaming (e.g., books, video cassettes, audio CDs). The verb ‘to stream’ is also derived from this term, meaning to deliver media in this manner. Internet television is a commonly streamed media.



Fig. 1. Video that user choose in the web site of the teacher is downloaded to his computer, distributed as a file or as a stream.

Both methods, distribute as a file or as a stream, have their advantages and disadvantages. Downloading complete video podcasts in advance gives the user the ability to play the video podcasts offline on, for example, a portable media player. A downloaded version can be watched many times with only one download, reducing bandwidth costs in this case. Streaming allows seeking (skipping portions of the file) without downloading the full video podcast, better statistics and lower bandwidth costs for the servers; however, users may have to face pauses in playback caused by slow transfer speeds.

A vodcast client may work with a separate, or integrated player. One such example of the latter is iTunes, which is an unusual case of a web feed

aggregator being added to a media player rather than vice versa.

5 Introducing e-learning in the classical teaching

Teachers and students are used to matters where the denominated “magisterial lesson” is the only existing activity and the objective test is the only instrument of evaluation. Then, we have arrived at a point from minimum implication where as many students as teachers seem to have accommodated and it is not infrequent that the wish to converge our subjects to the model advocated by the Bologna process is labelled as uncertain adventure by the most incredulous. Partly because there are reasons for that uncertainty, partly because there will be as much teachers as students who will not wish to increase their level of implication in the educative process, and because, even wishing it, they anticipate difficulties simply by the fact to go against something established.

Therefore, it is necessary that all the projects of adaptation of subjects to the European Higher Education Area (EHEA), which we could describe in the present scene of our universities like as pioneering projects at this moment, to be executed with maximum rigor [27].

We have to be aware of that our errors during the execution of these projects will be used by others to try to dynamite the process of convergence in the matter of higher education. The process of adaptation of subjects to the EHEA is only one face of a polyhedral reality in which another facet is the convergence of courses or even complete curricula of degrees.

Nevertheless, it does not correspond to the “basic” teacher of university (but to directors, committees, rectors, etc.) to make important decisions with respect to a whole course or the curriculum of the degree in which he gives classes, at least not individually. But it is his responsibility to organize his subject of the form that he understands more suitable.

According to this item, there are many efforts from teachers of university (sometimes with the inestimable help of students) to improve and to adapt their classes in the convergence to the Bologna process. Many of them are involved in the field of the e-learning [2, 3, 4, 5].

In the academic year 2005-06 some teachers of the Department of Applied Mathematics started a new model of Education into practice. The results of this new model were spectacular because the percentage of students that pass the exam was increased from a

typical 35% (in the previous 10 years the average was 35%) to an interval between 60% and 70%.

Last academic year, 2006-07, the results with the new model have been similar (a little bit higher), and equal with the typical model.

The model is based on three ways: the use of new technologies both in the classroom and out of the classroom and on the adaptation of the classes to the Bologna declaration.

Apart of that, a survey that is commented by Madden [25] found that the typical college-aged students view online videos at the highest rate among adults. These students are at the present ours at the university. Seventy-six percent of 18-29 year olds reported that they have watched videos online and twenty-two percent reported that they had watched educational videos.

If we consider that a basic part of the new exposition is to turn the process of ‘teach to learn’ in a process of ‘learn to learn’, transforming the conventional conception that we normally have of the learning process into a constructive conception, the teacher must assume that his/her paper of mere transmitter of knowledge (information) has to change. He must at least assume that the center of the process is not him but the student, and that the quantification of the credits will not be on the basis of his dedication, but on the one of the student.

Therefore, certain premises have settled down that are going to motivate the introduction of changes in the traditional way of teaching at university level.

- In the paradigm teaching-learning, it is taking place a change in which the educative efforts are centered every time with greater intensity in the individual that learns (the student). The society of the knowledge is also the **society of the learning**. These ideas are closely related to the conception of the education within a wider context like the **continuous education**, where the individual needs to be able to handle the knowledge, to update it, to select what is appropriate for a determined context, to be in permanent contact with the sources of information and to understand the learned things in such a way that it can easy and fastly be adapted to new and changeable situations.
- Likewise, student must know why learns a concept in order to adapt it to its context. This would create own initiative in the student, so that an individualized process of learning settles down (**the one that learns is oneself**).

- As consequence, student must see recognized and evaluated his effort. In fact, the evaluation must be source of feedback both for the students and for the teacher. The role of the evaluation is to guide, motivate and drive the work of the students, who must see it, in fact, like generator of prospects. For that reason the evaluation is made throughout all the process and not only at the end.
- If we want a **constructive** system of education, teaching must establish in an organized way the activities that will facilitate the accessible construction of the scientific knowledge. And to consider, also, which the student already knows.
- Learning requires that students imply themselves helped by the teacher. The relations teaching-learning (teacher-student) are complex and non-determinist. But, in any case, student must know that it learns doing.
- Spectacular changes in the teaching structure do not expect, but qualitative changes in the teaching strategies. Basically, it will imply to maintain a balance among subjects, alternative program and teaching time. For this reason it is fundamental to design a sequence of learning progressively increasing the difficulty of the tasks and organizing the support according to the difficulties of the student.
- All these represent an accessible challenge by the students since they can participate in his construction.

6 Vodcasting as a tool to develop the skills of information

By the standards of American Association of School Libraries, the use of video podcasts develops in students the following matters:

- Read, watch, and listen to the information in any format for gathering knowledge. Students would be qualified to evaluate the video podcast and include it in their range of knowledge.
- Collaboration with others to enlarge and deepen their knowledge. With the vodcast, the learning is more attractive for young people and it is easier to reach to more persons, being the action of sharing computer issues a type of divulgation of the knowledge very common

among students.

- Using technology to create new knowledge. It is an innovative way to get information to students and create projects that develop information skills.
- Use technology and other information tools for organizing and presenting knowledge, and understanding the ways that others see, use and access.



Fig. 1. Title page of all of our videos

The vodcast allows the creation of thematic libraries with periodic updates using as a means of communication video and audio.

The vodcast allows partitioning information in small capsules and being completing as new videos are created.

The idea is that these videos cover a lot of information well structured, with its own meaning, not too long and can be supplemented or related to other videos, without thereby each unit lose meaning, so, for example students can be use them one by one when they think appropriately.

But as in many situations, because vodcasting is at the beginning of its use in Education, its effectiveness and acceptance as an educational tool is not very well understood.

Two common vodcasting concerns are the effort and resources that are needed to produce vodcasts and the effects vodcasts have upon student attendance [17].

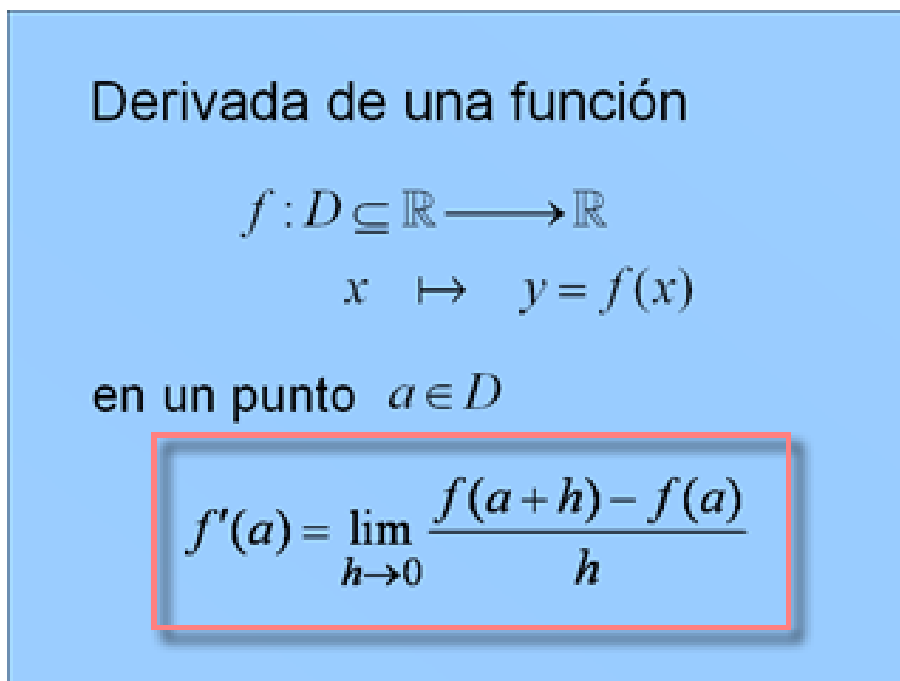


Fig. 2. The size of letters and formulas has to be big enough to be read in a small device such as an iPod nano

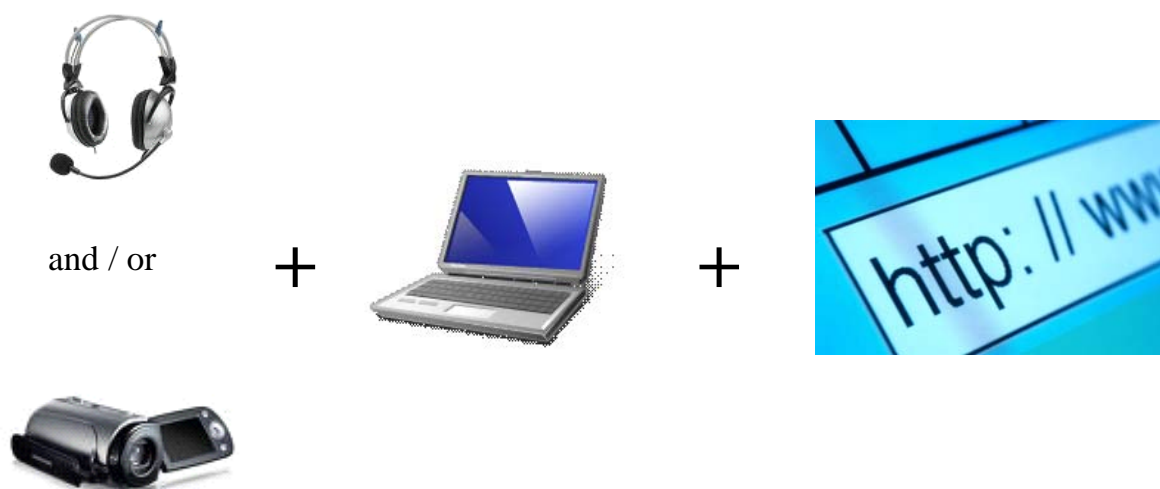


Fig. 6. All you need: simple capture, computer and web site.

The level of effort and resources to produce vodcasts will vary depending upon the vodcast format. Basic podcasts that combine narration and PowerPoint can be done quickly using a standard personal computer and easy software.

More elaborate vodcasts that combine other elements, such as handwriting or animation, require the use of specialized hardware and software [32].

However, many universities offer vodcasting production studios that require no technological expertise from the instructor.

A second concern is vodcasting's effect upon student attendance. Many argue that any technology that reduces the costs of non-attendance will surely reduce attendance. But attendance will largely depend on how vodcasts are used. Vodcasted classroom

lectures that involve no student involvement will likely reduce attendance. Whereas the use of vodcasts to preview lectures may improve attendance. Several papers that document the initial experiences with vodcasting and podcasting show little effect upon attendance [22, 26].

And according to these arguments, we do not recommend the use of vodcasting inside the classroom. First, based on our experience when a video is playing inside the classroom may cause surprise at the beginning for students, but the time to pass from this attendance to other attitude of relax is

very short. On the other hand, the aim of vodcasting is not that of the typical videos, but the use of them as a different tool to help students in their learning process out of the classroom. Item more, as we have said previously, it is “need” a RSS subscription or an Internet connection to download these short videos. Learning process (and teaching process as well) takes advantage of these short lessons when students can use at home, in the transport to or from the university, etc., that is, in some “lost” moments.

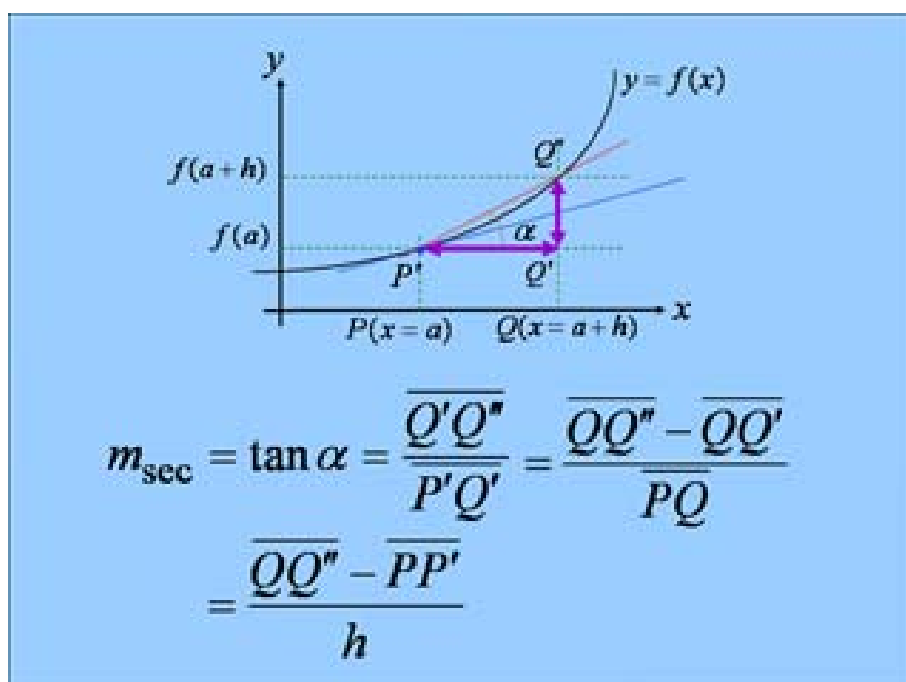


Fig. 3. Special care with the letters that are embedded on the figures and graphics

There are different formats for these kind of products:

- Adobe Flash (swf),
- AVI,
- iPod (M4V),
- QuickTime (MOV),
- Windows Media (WMV).

The choice is basically conditioned by the environment or medium in which we want them to be used.

In general, one of the basic ideas underlying all these formats is the portability and accessibility of information. There is no fixed nor where or when. The only condition is to have a device that allows its capture: computer, iPod, MP4, etc. The fact is that we

have a variety of devices whose size has been reduced over time, and this reduction (of size and weight) gives them some comfort features in the transport that should not be neglected. In general, we can ensure that the format of the information provides access to it by tools smaller than a book.

In any case, if the information is available on Internet, it means to socialize the acquisition of knowledge: reaching a wider audience.

One does not need to be student of a given subject or degree to be interested, need or want to acquire certain knowledge.

We can not ignore in any case the importance of providing an attractive medium both for the development of the material and for the access to it. The versatility of devices, techniques, and methodologies at our disposal is our great weapon

when we design and develop a good vodcast. We have to apply ICT in their entirety: preparation of the material (all available software), access to such information through Internet and use, for it, of very handy devices (computer, iPod, MP4,...). Obviously this involves designing and developing materials suitable for these devices. Although the contents do not change, it is not the same if they are designed to be tracked or run through a computer or an iPod.



Fig. 7. There is no fixed nor where or when.

In any case, to adapt this material, if properly designed, is the most simple of the process. You can even develop content in different languages just by changing the image and focusing on adapting the audio.

As for the direction or purpose you want to give to your vodcast, besides merely informative, its use in the field of university study is certainly something to consider. If in the EHEA 1 credit = 25 hours of student work, some of that work (learning task) must be done by students outside the classroom. This involves more effort on their part and another way to get information (the teacher is not present).

7 Conclusions

New methods and technologies are emerging in Education. And although e-learning is quite new in this field, innovation is a constant way.

Within the field of Mathematics, in which we develop our educational work, we believe that it is important to spread basic contents and explained in a simple and attractive way. These contents would be directed to any person with interest in learning Mathematics.

To accomplish this task we are preparing instructional videos from the various fields of Mathematics, allowing the person that will use them understand easily the concepts and learn to do exercises related to that topic easily.

It is creating a Vodcast for spreading Mathematics.

This type of tools is not yet developed enough and we think it can be very helpful for the dissemination of Mathematics and to change the image of Mathematics in general, making the image much more interesting.

A vodcast must be a regularly publishing content, so we tend to make a schedule of content that you want to publish and go to generate the corresponding videos so attractive to the viewer.

Such videos may be accompanied by other kinds of content that allow deeper into the aspects that are explained in the video for each theme.

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References:

- [1] 7 things you should know about...Podcasting, <http://net.educause.edu/ir/library/pdf/ELI7003.pdf>, June 2005.
- [2] Arribas Mercedes, Boal Natalia, Lerís Dolores, Sein-Echaluce María Luisa, Use of Mathematical Computation Systems (MCS) for mathematical training at Engineering, 2006 International Conference on Engineering and Mathematics, 2006, 159-166.
- [3] Bilbao Javier, Bravo Eugenio, González Purificación, Mathematical e-learning like a new model of learning based on Internet and electronic applications, WSEAS Transactions on Mathematics, Vol. 5, No. 7, 2006, 918-925.
- [4] Bilbao Javier, García Olatz, Rodríguez Miguel, Varela Concepción, Bravo Eugenio, González Purificación, Valdenebro Verónica, Uranga M. Emiliana, When the class finishes or it has not still begun, WSEAS Transactions on Advances in Engineering Education, Vol. 3, No. 11, 2006, 1030-1035.
- [5] Bilbao Javier, Rodríguez Miguel, Bravo Eugenio, García Olatz, Varela Concepción, González Purificación, Valdenebro Verónica, Uranga M.

- Emiliana, Use of the Moodle platform to improve the results of the students, INTED 2007.
- [6] Boylan, M. "What have we learned from 15 years of supporting the development of innovative teaching technology?" *Social Science Computer Review* (22:4), 2004, pp. 405-426.
- [7] Campbell, G. "There's Something in the Air: Podcasting in Education" *EDUCAUSE* (Nov/Dec), 2005, pp. 33-46.
- [8] Caruso, J. "Students and Information Technology, 2005: Convenience, Connection, Control, and Learning", presentation of the results of an EDUCAUSE Center for Applied Research survey, May 22, 2006.
- [9] Chan, A., and Lee, M. "An MP3 a Day Keeps the Worries Away: Exploring the Use of Podcasting to Address Preconceptions and Alleviate Pre-Class Anxiety Amongst Undergraduate Information Technology Students," in *Good Practice in Practice. Proceedings of the Student Experience Conference*, D.H.R. Spennemann & L. Burr (eds.), Sept. 5-7, 2005, pp. 59-71.
- [10] Clegg, Helen, Montgomery, Susan, Podcasting: A New Way to Create, Capture and Disseminate Intellectual Capital, Information Outlook, <http://www.allbusiness.com/technology/software-services-applications/11586302-1.html>, 2008.
- [11] Communications Executive Council. *Spotlight on an Emerging Media: Podcasts*. October 2006.
- [12] Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. "User acceptance of computer technology: A comparison of two theoretical models," *Management Science* (35:8), 1989, pp. 982-1003.
- [13] Dillon, A., Gabbard, R., Hypermedia as an educational technology: a review of the quantitative research literature on learner comprehension, control and style, *Review of Educational Research*, Vol. 68, No. 3, 1998, 322-349.
- [14] Durbridge, N. "Media in Course Design, No. 9, Audio Cassettes," *The Role of Technology in Distance Education*, Kent, UK: Croom, Helm, 1984.
- [15] EDUCAUSE "Seven Things You Should Know About Podcasting," *EDUCAUSE Learning Initiative*, 2005.
- [16] Educational Pathways. "Who's On the Podcasting Pathway?" 2006.
- [17] Gattis, L., Getting Started with Instructional Podcasting, *Journal of the Academy of Business Education*, vol. 9, 2008.
- [18] Gribbins, M., The Perceived Usefulness of Podcasting in Higher Education: A Survey of Students' Attitudes and Intention to Use, *Proceedings of the Second Midwest United States Association for Information Systems*, Springfield, IL May 18-19, 2007.
- [19] Introduction of a Podcasting tool, Griffith University, <http://www3.griffith.edu.au/03/ltm/docs/Podcastin-g-at-Griffith-infosheet.pdf>, 2006.
- [20] Jetnikoff, Anita, The bard and the web : using vodcasting to enhance teaching of Shakespeare to pre-service English teachers. In: Pullen, Darren L. and Baguley, M. and Gitsaki, C., (eds.) *Technoliteracy, Discourse and Social Practice : Frameworks and Applications in the Digital Age*. IGI Global, Hershey, Pa., 2009.
- [21] Johnes, G. "Case Study: Podcasts as a Learning Tool in Economics," *Economics Network*, July 2005.
- [22] Lane C. "Podcasting at the UW: An Evaluation of Current Use," 2006, University of Washington.
- [23] Lorenzo "An Introduction to Podcasting" *Educational Pathways*, October 2006.
- [24] Maag, M. "Podcasting and MP3 Players: Emerging Education Technologies," *Computers Informatics Nursing* (24:1), 2006, pp. 9-13.
- [25] Madden, M. "Online Video," *Pew Internet & American Life Project*, 2007, http://www.pewinternet.org/pdfs/PIP_Online_Video_2007.pdf.
- [26] Meng, P. "Podcasting and Vodcasting," *University of Missouri IAT Services White Paper*, 2005.
- [27] Mijke Slot, Changing user roles in ICT developments; the case of digital television, *Telematics and Informatics*, Vol. 24, 2007, 303-314.
- [28] Shim, J.P., Shropshire, J., Park, S., Harris, H., and Campbell, N. "Perceived Value of Podcasting: Student Communication-Medium Preferences," *Proceedings of the 12th Americas Conference on Information Systems*, Acapulco, Mexico, August 2006, pp. 2186-2194.
- [29] Stein E., Vodcasting: Exploring the Future of Syndicated Media. Finding, Viewing and Creating Vodcasts on the Mac - Your 15 minutes of fame are coming right up!, *MacTech: the journal of Macintosh technology*, Vol. 21, No. 11, 2005, <http://www.mactech.com/articles/mactech/Vol.21/21.11/Vodcasting/index.html>
- [30] Udell, J. "IDG's Patricia Smith interviews me about podcasting and screencasting" *INFOWORLD Podcast*, March 3, 2005, available at: <http://weblog.infoworld.com/udell/2005/03/03.html>, accessed on Feb. 11, 2007.

- [31] University of Minnesota. "Podcasting in Education" *Office of Information Technology*, 2006.
- [32] Virginia Tech, Learning to use Camtasia, 2006, <http://www.iddl.vt.edu/instructors/camtasia/>
- [33] Walton, G., Childs, S., and Blenkinsopp, E. "Using mobile technologies to give health students access to learning resources in the UK community setting," *Health Information and Libraries Journal*, (22:2), 2005, pp. 51-65.