Joining the Podcast Revolution

Bruno C. Jham, D.D.S., M.S.; Gabriela V. Duraes, D.D.S.; Howard E. Strassler, D.M.D.; Luis G. Sensi, D.D.S., M.S., Ph.D.

Abstract: In recent years, there has been a growing interest in the latest generation of web-based tools such as podcasts. Podcasts are media files that can be distributed via the Internet and played on computers and handheld devices, including iPods or other digital audio players. The essence of podcasting is the creation of audio and/or video content for an audience that wants to listen to what they want, when they want, where they want, and how they want. With students now more mobile than ever, the idea of being able to access information without being linked to a certain physical location is very attractive. In the specific context of dental education, lectures and clinical procedures can be recorded by academic staff and distributed over the Internet to students as an audio or video podcast. The objective of this article is to review the most important concepts in podcasting, using simple and nontechnical terminology. In addition, this review aims to stimulate and encourage dental educators to employ this technology as a tool to enhance the learning experience of undergraduate and postgraduate dental students.

Dr. Jham is a Resident and Ph.D. student in Oral and Maxillofacial Pathology, Department of Diagnostic Sciences and Pathology, University of Maryland/Baltimore College of Dental Surgery; Dr. Duraes is a Dean's Faculty, Preclinical Fixed Prosthodontics Laboratory, Department of Endodontics, Prosthodontics, and Operative Dentistry, University of Maryland/Baltimore College of Dental Surgery; Dr. Strassler is Professor and Director of Operative Dentistry, Department of Endodontics, Prosthodontics, and Operative Dentistry, University of Maryland/Baltimore College of Dental Surgery; and Dr. Sensi is Assistant Professor, Department of Endodontics, Prosthodontics, and Operative Dentistry, University of Maryland/Baltimore College of Dental Surgery. Direct correspondence and requests for reprints to Dr. Bruno C. Jham, University of Maryland/Baltimore College of Dental Surgery, 650 W. Baltimore St., 7 North, Baltimore, MD 21201; 410-706-7936 phone; 410-706-0519 fax; bjham001@UMaryland.edu.

Key words: dental education, podcasts, podcasting

Submitted for publication 9/19/07; accepted 11/30/07

In 2001, Apple launched the first handheld digital audio player, the iPod. The iPod is the most popular player of its kind, with more than 40 million units sold over five years. The first generation of the iPod had 5GB memory, was the size of a pack of playing cards, and could store 1,000 songs. Since then, smaller models with larger memories have been developed.[1] Recently, the sixth generation of the iPod was released. It has 160GB memory and reaches up to forty hours of music playback and seven hours of video playback. In addition, Apple introduced the iPod Touch, a player that has touch-on screen, wi-fi, and Internet access through the web browser Safari.

Apart from the obvious benefit of being able to download music and movies, iPods allowed the creation of a new medium: the so-called podcast.[1] The term was first used in 2004 and in 2005 was declared word of the year by the New Oxford American Dictionary. Podcast is a blend of iPod and broadcast.[2] While Apple did not come up with the name, this was certainly interesting for the company as it provided a convenient way to fuel even more the public's fascination with anything "pod" and position the iPod as the enabler of podcasting.[3] The host or author of a podcast is often called a podcaster, whereas the software that manages the automated downloading of material is called a podcatcher.[4] When video images are transmitted in addition to audio, the term vodcast is used.[4,5]

The aim of this article is to review the most important podcasting concepts, using simple and nontechnical terminology. In addition, this review aims to stimulate dental educators to consider employing this technology in their universities as a teaching tool for undergraduate and postgraduate dental students.

What Are Podcasts, Why Should We Podcast, and What Are Their Pros and Cons?

Podcasts are media files that can be distributed via the Internet and played on computers and handheld devices, such as iPods or other digital audio players.[4,5] Podcast can mean either the content itself or the method by which it is syndicated; the latter is also termed podcasting.[2] The essence of podcasting is the creation of audio or video content for an audience that wants to listen to what they want, when

they want, where they want, and how they want. In addition, audio and video materials can be forwarded to subscribers, even without user intervention. This eliminates the laborious and often tedious process of searching for and downloading files on a regular basis. Users can then listen to and watch podcasts on their computer (e.g., using Windows Media Player), or download to portable MP3 players and listen/watch on the move/anywhere.[6]

Students are now more mobile than ever. They often find themselves multitasking, working in part-time jobs, or located some distance from a parent institution on professional practice placement.[6] Thus, the idea of being able to access information without being linked to a certain physical location is very attractive.

In a broader context, podcasts may also be employed for the following purposes: recording and distributing news broadcasts; recording and uploading foreign language lessons to an instructor's website; developing audio/video recruiting brochures with personalized messages; recording teachers' notes; recording meeting and conference notes; oral history archiving and on-demand distribution; and sport event distribution.[7]

Educational podcasts, which are audio recordings of items such as lectures, interviews, and book readings, are increasing in number. Currently, they account for approximately 7 percent of the total number of podcasts available for downloading.[8] Indeed, the recording of lectures is one of the most obvious uses of podcasts in higher education. Lectures can be recorded by academic staff and distributed over the Internet as an audio podcast with the inclusion of images from applications, such as PowerPoint.[4] In the specific case of dentistry, podcasts may emerge as an important tool for recording and distributing protocols and demonstrations of technical procedures.

Traditional methods of distributing audiovisual educational material by video or DVD are expensive and restrictive. The Internet has reduced these distribution costs and allowed experts in their field to economically distribute audiovisual material to anyone with an Internet connection. The podcasting technology has automated this process and reduces technological barriers.[4] There are numerous advantages of podcasts: 1) podcasts allow listeners to hear recordings on demand, i.e., when and where the listener wants; 2) podcast production is relatively inexpensive, which obviates any need for costs to be shifted to the listener (this is why almost all podcast "subscriptions" are free); 3) podcasts are digital and thus available online to anyone in the world with online access; and 4) podcasts are simple and user-friendly.[9]

Disadvantages of podcasts include the following: 1) significant challenges for integration with existing technology infrastructures; 2) lack of academically available content and difficulties with licensing agreements from commercial resources; 3) technical limitations and lack of training resources; and 4) lack of awareness and knowledge by faculty and students of podcasting functionality.[7] In a more pedagogical context, an additional disadvantage is that a podcast is essentially a passive learning experience focused on an audio or audio/video facility alone.[8] One way to overcome this problem would be to develop podcasts and vodcasts that are more interactive through the use of pauses for reflection by the viewer/listener on questions presented in the media. The viewer/listener would be instructed to pause the presentation and answer a question or reflect on a concept. When the viewer/listener completes the task, he or she could then continue to hear/view the responses to the questions. Furthermore, one important concern among educators regarding podcasting is the replacement of real-time classroom interactions with the students. In this context, it should be stressed that podcasts should complement rather than replace lectures; students still need to attend lectures and then use the podcasts while writing up or revising notes.[10]

Who Else Is Already Podcasting?

The use of podcasts is growing rapidly in the education field. In the UK, at least twenty schools are using this technology, including the universities of Wales, Dundee, Cambridge, Coventry, and Hertfordshire; Cranfield School of Management; and Imperial College London.[10] Likewise, physicians from the Royal Sussex County Hospital have started to podcast otolaryngology surgical procedures to enhance undergraduate and postgraduate doctors' experience and facilitate self-directed learning.

In the United States, several schools and institutions are podcasting courses to their students, including Duke University, Drexel University, Allegheny College, University of Chicago, and Purdue University.[7] The Massachusetts Institute of Technology (MIT) provides many of its lectures as podcasts that are available to students, faculty, and the com-

munity at large. In addition, the university accepts submissions that are related to MIT's core missions of teaching, research, service, and community.[11]

Within the biomedical field, the Department of Radiology of the Johns Hopkins University publishes lectures weekly and has received over 3,000 subscription requests in a five-month period.[12] The National Institutes of Health is using this technology to communicate with its audience.[13] The University of San Francisco has lecture podcasts on a course website for nursing students and reports high satisfaction.[14] The University of Texas at Houston School of Nursing is preparing to deliver lecture podcasts to students automatically, with the ultimate goal to offer all courses in MP3 format.[15] The University of Utah Department of Biomedical Informatics has a weekly seminar that can be remotely viewed live or at a later time via podcast technology. The seminar is an approved source of continuing medical education (CME) and presents the possibility of the podcast also becoming an online source for CME credit.[16]

Organizations that have joined the podcast technology include the Society of Critical Care Medicine (SCCM). The SCCM recently implemented the iCritical Care Podcast, where critical care clinicians have access to audio companions to articles published in SCCM journals, interviews, and a forum for the leaders of the SCCM to keep in touch with other members.[17]

Prestigious scientific journals including the *New England Journal of Medicine, Science,* and *Nature* offer podcasts from their websites summarizing specific content. This allows busy professionals to listen to a summary of key content in the journal or learn about a new procedure on their commute to the office.[13] According to the *New England Journal of Medicine,* more than 30,000 people a week are receiving the information, although they admit it is difficult to know how many people actually listen to the podcast after it is downloaded.[5]

Within the dental field, the American Dental Association currently develops a list of podcasts on various topics related to dentistry. The University of Michigan (UM) School of Dentistry is already developing a series of vodcasts that demonstrate preclinical and advanced clinical procedures.[13] In fact, UM has been a pioneer in podcasting among U.S. schools. The idea was developed when a dental student inquired why lectures were not available electronically. Upon completion of a survey, it was revealed that the majority of students would prefer to listen to audio recordings of lectures using their iPods. The Michigan experience had some unique features: 1) instead of taking a new technology and seeing how it could be used to enhance teaching and learning, the UM started with a learning challenge and then arrived at a solution that uses new technology; 2) the initiative was driven from the bottom up, that is, from students to faculty and staff; and 3) the project involved not only collaboration among dental school students, faculty, and staff, but also the UM's Information Technology Central Services unit.[18]

Here at the University of Maryland dental school, we are working to create podcasts and vodcasts for patient, alumni, and student access. These include patient postoperative instructions and home care, potential continuing education programs, podcast development instructions, and new techniques and technology for dental care. Podcasts are available at www.dental.umaryland.edu/podcasts.

How Do We Create a Podcast?

Podcasting involves three essential components: capturing, publishing, and distributing electronic media/digital content. Capturing content, although touted as a simple process, requires some level of expertise (a producer), special software, and the knowledge and skill to record and save the content as an MP3/AVI file.[13]

Content is then published via Really Simple Syndication (RSS), so that it can be picked up by an aggregator for distribution and ultimately distributed to the end user. RSS, also referred to as a web feed, offers the convenience of a subscription service, much like a newspaper or a magazine, and automatically delivers content directly to the subscriber.[13] To distribute a podcast, a web page with space to store the podcast is needed. A website acts as a contact point for users on the Internet. Many universities or Internet service providers can supply the necessary services.[4]

Having published the contents, users need then to subscribe to the podcast to be able to collect the information. Once a user has subscribed to a podcast, the computer takes over the complex task of downloading information and synchronizing a portable media player so that the user can watch, for example, a lecture whenever and wherever they choose. Software is available for Macintosh computers, Windows PCs, Linux, and handheld personal organizers. There

are many programs that can perform this aggregating, but two of the best-known programs are iTunes or iPodder (both available free). The advantage of iTunes is that it simplifies the process and automatically transfers material to a portable media player.[4]

Conclusions

Podcasting is being increasingly used as a tool for distribution of information by a variety of organizations and associations, such as medical and dental schools, research institutions, and scientific journals. Podcasts offer several advantages, including low cost and ease of use. In the context of dental schools, podcasts can be used to broadcast lectures, as well as clinical procedures. Thus, podcasts represent a very attractive teaching tool. However, podcasts are not free of disadvantages. Technical issues are probably easier to resolve than might be expected; however, pedagogical aspects, such as the replacement of real-time classroom interactions with students and the interactivity of podcasts, will require further discussion.

Dental educators should consider implementing podcast technology in their courses and schools to enhance the learning experience and motivate undergraduate and postgraduate dental students to continue learning. In the future, studies are needed to assess the usefulness of podcasts in order to objectively measure the value of this tool within the dental education context.

Acknowledgments

Dr. Jham gratefully acknowledges CNPq-Brazil doctorate scholarship (process 201590/2006-9).

REFERENCES

1. Rainsbury JW, McDonnell SM. Podcasts: an educational revolution in the making? J R Soc Med 2006;99:481–2.
2. Arthur C, Schofield J. Short shrift. At: http://technology.guardian.co.uk/weekly/story/0,16376,1683937,00.html. Accessed: September 19, 2007.
3. Dixon C, Greeson M. Recasting the concept of podcasting: part I. At: http://news.digitaltrends.com/talkback109.html. Accessed: September 19, 2007.
4. Whitehead DE, Bray D, Harries M. Not just music but medicine: podcasting surgical procedures in otolaryngology. Clin Otolaryngol 2007;32:3–6.
5. Mathieu J. Blogs, podcasts, and wikis: the new names in information dissemination. J Am Diet Assoc 2007;107:553–5.
6. Boulos MN, Maramba I, Wheeler S. Wikis, blogs and podcasts: a new generation of web-based tools for virtual collaborative clinical practice and education. BMC Med Educ 2006;6:41.
7. Skiba DJ. The 2005 word of the year: podcast. Nurs Educ Perspect 2006;27:54–5.
8. Palmer EJ, Devitt PG. A method for creating interactive content for the iPod and its potential use as a learning tool: technical advances. BMC Med Educ 2007;7:32.
9. Burns TM. The forecast for podcasts: sunny skies but not necessarily with clear visibility. Neurology 2007;68:E19–20.
10. Boone J. Podcasts allow students to listen and learn at leisure. At: www.ft.com/cms/s/0/b371f292-9aa2-11da-8b63-0000779e2340.html?nclick_check=1. Accessed: October 29, 2007.
11. Information and Services Technology, Massachusetts Institute of Technology. Podcasts at MIT. At: http://web.mit.edu/ist/podcasts. Accessed: November 1, 2007.
12. Rowell MR, Corl FM, Johnson PT, Fishman EK. Internet-based dissemination of educational audiocasts: a primer in podcasting—how to do it. AJR Am J Roentgenol 2006;186:1792–6.
13. Johnson L, Grayden S. Podcasts: an emerging form of digital publishing. Int J Comput Dent 2006;9:205–18.
14. Maag M. Podcasting: an emerging technology in nursing education. Stud Health Technol Inform 2006;122:835–6.
15. McCartney PR. Podcasting in nursing. MCN Am J Matern Child Nurs 2006;31:270.
16. Tripp JS, Duvall SL, Cowan DL, Kamauu AW. Academic podcasting: quality media delivery. AMIA Annu Symp Proc 2006:1125.
17. Savel RH, Goldstein EB, Perencevich EN, Angood PB. The iCritical care podcast: a novel medium for critical care communication and education. J Am Med Inform Assoc 2007;14:94–9.
18. U-M Dentistry News. U-M School of Dentistry and Apple Computer in partnership. At: www.dent.umich.edu/about/aboutschool/news/news2005/news091905.html. Accessed: October 29, 2007.