UNREVEALED POTENTIAL IN DELIVERING DISTANCE COURSES: THE INSTRUCTIONAL VALUE OF AUDIO

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Abstract: This article addresses the issues and concerns regarding delivering methods in online instruction. Although a rich multimedia is available nowadays, recent research shows that online teachers primarily use text-based media (e-mail, written documents, and threaded discussions) with a little or no use of instructional multimedia. The authors stress the importance of combining different types of delivery media for creating a learning environment that provides multimodal input to online students. The instructional value of audio and its implications on quality of online instruction is specifically emphasized. Audio tools and instructional materials enrich the learning experience of distance students otherwise limited by text-based instructional media. Integration of instructional audio affects the nature of online learning by adding new dimensions such as human voice and sound. This article provides teacher and student perspectives regarding the implementation of audio. The implications of audio use on management policy in distance education are also presented.

Keywords: distance education, online instruction, delivery mode, multimedia, audio

I. INTRODUCTION

By tracking back the origin of distance education throughout history, it is possible to identify many different forms, teaching strategies, media, and techniques for delivering education content to distance students. Since the very first correspondent courses established by Isaac Pitman in the late 1800's, distance education has undergone a significant transformation [1]. From print-based communication and teacher centered approach, distance education courses have moved toward student centered approach with multiple levels of interaction based on a variety of multimedia.

According to Sherron and Boettcher, the development of distance education greatly depends on advancements of educational delivery media and technology in general [2]. Taking into consideration this criteria, these two authors recognized four generations of distance learning technologies and an equal number of developmental stages of distance education. In the first stage (1850s-1960), the predominant approach was the implementation of just one delivery technology such as printed media, radio or TV. The second stage (1960s – 1980s) can be labeled as period of combination and using multiple technologies (TV audio & video cassettes, fax and printed media) without computers. The third stage (1985-1995) refers to the implementation of multiple technologies including computers and computer networking (email, chat sessions, bulletin board using computers and network, computer programs and internet resources, audio conferences, large room video conferences, fax, print, etc.). Finally, the last stage (1995-present) of distance education development is labeled as a generation of multiple technologies including high bandwidth computer technologies such as: live video interactive learning, desktop video conferences via satellite, web technologies, etc.
Undoubtedly, a new wave of internet based technologies has reinforced the concept of distance education through online instruction which is considered as the most advanced form distance education nowadays. Typically, online courses are delivered via learning management systems (LMS) such as: BlackBoard, Angel, Moodle, etc. LMS’s are such applications that facilitate students’ online learning and provide a solid framework for communication, sharing files, accessing online resources, and supporting a variety of multimedia content. Therefore, LMS, as a relatively new delivery format for distance course integrates the latest technological achievements in the domain of educational and web based technology.

II. CURRENT ISSUES IS DELIVERING DISTANCE COURSE

Due to rapid technological progress, rich multimedia including interactive web applications are now available for implementation in an online learning setting. However, regardless of the variety of available instructional multimedia and advance LMS’s, studies suggest that currently, the majority of online courses still provide primarily text-based learning experiences to distance students.

A comprehensive overview of the current use of multimedia in online instruction is provided in the research conducted by Adams. The sample for this study was 534 online programs and coursers (277 undergraduate and 307 graduate levels) across 409 educational instructions. Findings showed that text-based delivery format was the dominant method for sharing information and communication with students in all 409 universities. Instructors mainly used discussion board (including text documents as attachment) as the communication tool and for course activities (N=313), while email was the main communication tool in 16.85% of courses (N=90). Adams concluded that “in spite of the advancement of new communication technologies that might add more channels of communication to text-based instruction to create a 'media-rich' learning environment, the delivery of course instruction online appears to rely heavily on email, chat and discussion boards” [3].

A study by Mitra and Hall also investigated the modalities of technology use in distance education with emphasis on the concept of discursive practice. These two authors pointed out that the current distance technologies provide new opportunities for teacher-student communication in distance courses. However, their main conclusion was that “the fact that distance education often takes place with the use of text-based systems, leads to the re-thinking of the distance education “classroom”…” [4]. In the same vein, other authors, Deborah [5], Savery [6], and Michelich [7] have reported that current online instruction provides primarily text-based learning experience to students.

Clearly, these study results have raised relevant concerns regarding the implementation of new media in distance courses and the promotion of quality learning online. By its nature, learning is a social phenomenon and the lack of personal contact with instructors in text-based courses may lead to some serious issues such as low levels of motivation, alienation, etc. Furthermore, the learning process is based on receiving information through several different channels such as audio, visual, and kinetics, as discussed by Sankey [8]. In a face-to-face learning environment, an instructor is physically present in the classroom and guides the learning process by providing, simultaneously, audio, visual, and non-verbal input such as facial expression, gesture, etc. However, these integral elements of the educational process are a missing part of online learning for the majority of the students. Some recent studies conducted by Lam and McNaught [9], and Birk [10] suggest that implementing adequately designed multimedia may enhance learning experience and even compensate for the lack of teaching presence in an online environment.

Finally, the importance of combining multimedia instructional materials was pointed out by Rice, Hiltz and Spencer. In their view, adding multimedia to primarily text-based online courses is an adequate way to enhance learning outcomes. “Text based communication may not create an optimal learning environment for some learners, given that learners have different learning styles and preferences in terms of type or medium of information… combining one or more other media with text
based asynchronous text may improve learning” [11]. However, based on the studies presented above, the current trend in delivering online courses relies primarily on text based course work with little or no multimedia support. Thus, this kind of trend may raise the following questions: why isn’t instructional multimedia better incorporated in online instruction? Why don’t instructors use more audio tools and audio input to compensate for the major disadvantage of distance learning: the absence of the instructors’ physical presence? What are the barriers for implementing multimedia and audio tools in online instruction? Is a primarily text-based learning environment sufficient for providing high quality instruction at a distance?

III. THE INSTRUCTIONAL VALUE OF AUDIO IN E-LEARNING

According to Simonson et al. [12], the imperative for distance teachers is to think how to enhance communication in order to promote teaching, social and cognitive presence, and overall effectiveness in online learning. Simonson and colleagues argued that the utilization of varieties technologies would be the most appropriate way for establishing the adequate level of online communication and dynamic learning environment. Thus, they proposed the following taxonomy of distance education technologies: prerecorded media, two-way audio, two-way audio with graphic, one-way live video, two-way audio, two-way audio/video and, desktop two-way audio-video.

Implementing advanced educational technologies may have significant implications for managing distance education, teaching strategies and students learning activities. However, there are many concerns regarding the integration of advanced education tools into online courses, such as: level of teachers’ skills for using advanced technology, proficiency in designing multimedia instructional material, technical support and maintenance of advances educational systems, internet connectivity and accessibility to rich multimedia, initial costs of the software and equipment, etc. Furthermore, the fact that one uses advanced instruction tools does not automatically imply or guarantee a good learning outcome and overall course success. All of these issues may be critical for distance educators and school policy makers in the process of deciding what type of delivery mode will be used in online instruction.

Although advanced instructional tools and software (e.g. video conferencing) may best compensate the disadvantages of distance courses and provide a learning environment that is more similar to the natural face-to-face setting, the existing body of literature indicates that even the use of simple audio tools can significantly change the process of online learning. Nowadays, the most popular audio aids in online instruction may be classified in the following three general groups:

- voice mail,
- podcast (standard and enhanced podcast), and
- audio conferencing systems.

The audio aids listed above are now available through many different web services and supported by a variety of commercial and open source applications. The potential of audio based teaching and learning is not limited just to the virtual environment. The ever increasing trend in using portable audio devices for educational purposes may have a profound impact on the future of distance learning. Portable audio devices reinforce the educational use of audio instructional materials in distance courses and can serve as a complementary and supportive role of leaning activities.

Although simple at the first glance, audio technologies can have significant advantages over other more advanced media system. For instance, in comparison to video conferencing or prerecorded video instructional materials, using audio is typically more economically beneficial. Production of audio instructional materials could be done by low-cost or free applications (e.g. Audacity) which is not the case with producing an instructional video or interactive animation. Audio production is also less time-
-consuming than the development of an instructional video. Additionally, the majority of online instructors with basic computers skills could create audio files that could be sent out to online students. Accessibility is another additional advantage of using audio in online instruction. Many online learners are located in remote areas without broadband internet connection, which is a main precondition for using instructional materials, such as streaming videos or interactive simulation/animations. Flexibility is also a significant advantage of audio format. Nowadays, iPods, mp3 Players, cell phones and other PDAs are widely spread among the student population and each of those devices could be used for playing an audio lesson. Therefore, students may take their audio lessons and listen to the lecture whenever they wanted to.

3.1 Audio tools from Instructors perspective

The implementation of audio prerecorded media (standard and enhanced audio podcast), one way audio or audio conferencing systems into text based online courses has many challenges. One of these challenges in the process of adding new audio delivery media to distance courses and combining with other media refers to the instructor’s professional preparation for teaching in an audio based learning environment. Acquiring an adequate level of skills and competencies seems to be critical for successful online instruction and teaching. The current body of literature indicates that from the instructor’s standpoint, the relevant issues regarding audio use should be addressed from at least three dimensions.

- First, there are requirements regarding the technical aspect of audio production [13]. Online instructors need sufficient skills regarding the use of audio devices, such as how to manipulate them, how to record high quality sounds, to edit, and how to publish audio files, etc.
- Second, in addition to technical proficiency in using audio equipment it is imperative for online instructors to know how to design effective audio educational materials in order to enhance learning and retention. Instructors should have sufficient background knowledge regarding the design of audio instructional materials and be familiar with relevant theories such as Multimedia theory or Cognitive load theory. As discussed by Clark Nguyen and Sweller [14], students typically experience cognitive overload when the audio is not properly combined with textual materials. These three authors proposed a set of empirically verified guidelines for designing an effective audio based instructional materials.
- Third, instructors need to know how to apply audio tools and materials in the teaching and learning process. Instructors have to be familiar with the methods and techniques of teaching with audio. Simonson et al. [15] pointed out that teaching with technology requires a different set of skills and competencies than in traditional educational approach. Instructors should know how to use technological tools effectively. Therefore, it is necessary that distance education policy makers organize and financially support specific training for using new educational tools.

One of the new sets of competencies and skills of instructors who use the two-way audio conferencing system refers to the instructor’s capabilities to facilitate and lead audio discussion. There is a variety of issues that should be taken into consideration prior starting any audio discussion. Some of those questions are: how many students should be included in an audio discussion; what should be the structure of the conversation; how long should the students be “on-air” (time limit for each speakers); how and when to give feedback, etc. Frey and Overfield [16] proposed an extensive list of items/elements that may serve as guidelines for instructors who intend to use audio-conferencing in online instruction. Some of the following recommendations were: maximizing interaction through real-time audio communication, presenting content in blocks of 10-15 minutes followed by discussion, providing prompt feedback to students, providing readings before the audio conference take place, combining audio conference session with other instructional media such as e-mail, PowerPoint presentation, using handouts as supplemental instructional materials, and evaluating the event at the end of the session, etc.
According to Frey and Overfield the major advantage of audio-conferencing is capability to provide a dynamic interaction. Supporting evidence to these claims can be found in some other empirical studies [17] which have also indicated that audio-conferencing promotes student-to-student interactions and have a positive effect on instructor-student relationships in online courses. There are many examples of using free audio/videoconferencing applications, such as Skype. Briggs [18] reported that at two Pennsylvania teaching colleagues used Skype to bridge the gap between online students caused by lack face-to-face communication. Both the teachers and students had entirely positive impressions regarding the use of this open source tools for educational purposes.

Podcasting is another way audio could be used for enhancing online discourse, teaching and cognitive presence, and overall coursework. Deal [19] argued that there are three significant steps in developing podcast audio session. Therefore, online instructors should be familiar with the process of audio file production, podcast publication, and delivery. All three steps are critical for developing quality audio instructional materials. Considering that learning assumes multiple types of teaching inputs (visual, audio, etc.), the author reported that podcasts, as a supplemental teaching tool, can have a positive impact on students course performance and final outcomes.

3.2 Students’ benefits from audio based instruction

“Humans enjoy the sound of the human voice. Hearing an individual’s voice adds another dimension to an online identity“ [20]. Audio as a supplemental instructional material (either as audio-conferencing or podcast) primarily helps students overcome the limitations of virtual environments such as the absence of direct communication between instructor and students. The body of literature indicates multiple benefits from using an audio podcast in online instruction. For example, based on empirical findings, van Zenten [21] stressed that audio podcasts can supplement and add important human dimension in text based online courses and enhance an online learner’s experience. Audio podcasts also help distance students feel less isolated and more connected with other participants in an online learning environment. Furthermore, audio podcast sessions can be downloaded as audio files and be used via iPod or some other audio devices what allow significant flexibility in online learning.

Student’s satisfaction is another aspect that may be positively affected by using audio. In an experimental study conducted by Spickard [22] students who received instructional materials with audio narration were not only more satisfied with the online course, but that they also showed a trend of achieving higher post-intervention knowledge scores in contrast to their peers in the control group.. Woods and Keeler [23] conducted an experiment in which they tested the effect of the audio message attached to the email. The audio message contained feedback about each student’s achievement in online course. The main findings indicated that there was a significant difference between the group of students who received the emails with audio feedback, and the control group. Due to the effect of audio feedback message, students’ perceptions of their personal relationship with the instructor was increased significantly. The second major finding was that the students’ sense of community was also improved and that their satisfaction with the overall learning experience was also positively affected. Other empirical studies have also indicated that using audio tools in online instruction can have a positive effect on enhancing students’ perceptions of teaching presence and also students’ sense of having an online learning community [24.]

In addition, it is worthy to mention that recent studies have shown that audio podcasts have significant implications on a student’s course performance and final outcome. For example, Lee and Chan have reported that “survey respondents saw the podcasts as being beneficial to the affective aspects of their learning, as well as the cognitive aspects, by clarifying and enhancing their understanding of the subject material...” [25]. This result is supported by a similar study conducted by John and Boucouvalas [26], in which audio instructional materials were shown to help students who were the auditory type of learners. This finding is even more significant if we take into consideration Vincent and Ross’s research [27] which indicated that approximately 50% of all learners have the most developed audio channel for receiving information.
3.3 Management policy and audio tools in distance courses

Management and distance education policy are always critical for success in online learning, regardless of whether the most advanced technologies are used or not. In Parscal’s view, the way of delivering distance educational programs is a key for learning success. According to this author, “program delivery is an area of distance education administration that has seen the most development and innovation and is the one that should be approached with the highest level of caution” [28]. Selecting the appropriate delivery medium is one of the most critical steps in the entire process of designing and teaching distance courses. Therefore, from a distance education management standpoint, expenses related to the use of delivery media and its efficacy are major concerns.

Undoubtedly, the selection of delivery media affects the budgeting of distance courses. In turn, distance education policy makers may have to face a variety of financial issues. Typically, finance issues are associated with four types of costs.

- First, there is an initial cost for purchasing the adequate audio equipment and building the technical infrastructure. Standard audio equipment includes devices such as microphones, voice recorders, loudspeakers, computers, CD’s, audio books, etc.
- The second category of expenses refers to the software and audio instructional materials. Currently, a variety of professional applications for producing audio instructional materials are available on the market. Also, part of the budgeting is reserved for purchasing software licenses for audio conferencing systems.
- The third category of expenses includes technical support and system maintenance. These additional services are crucial for keeping audio systems and learning management platform functional.
- Finally, the fourth type of cost is related to technology training of faculties. Ideally, distance education policy makers should think about technology training as a permanent process of teachers’ professional development. Technology training will provide online instructors with critical knowledge, skills and competences for using audio equipment, software and designing effective audio instructional material. As discussed by Boetthchers [29], technology training is not just aimed to update teachers’ technical skills and competencies, but to also provide sufficient knowledge regarding teaching methods in an audio supported online learning environment.

Budgeting distance education programs was and will be an everlasting concern of every school or university aiming to provide online instruction. It would be remiss to overlook that without considerable financial support there would be no solid technical infrastructure, quality of audio instructional materials, or well trained distance instructors—all of which are main prerequisites for a successful learning process in an online environment. However, in comparison to expenses associate with the use of other delivery media (e.g. video, teleconferencing technology) audio based online instruction is still fairly inexpensive but significantly valuable, from the student, teacher, and management standpoint.

Furthermore, in recent years, advanced Web 2.0 technology offers an endless array of tools that may be used for supporting audio based online instruction. Thus, implementation of Web2.0 audio tools and other open source applications (e.g. VoiceThread, Skype, Audacity, WavePad Audio Editor, etc.) may be a significant cost cutter that could make more room for allocating available funding to teachers’ technology training.

IV. Conclusions

As with any other educational technology, the instructional value of audio tools and audio instructional materials depends primarily from how it is used for the given context and learning
environment. The existing body of research has shown that audio (audio-conferencing, podcasting, voice mail, email with attached audio files, etc) has the potential to transform distance course into a more natural learning environment with multiple modes of interaction and educational inputs. Therefore, the answer to the question: “do and to what extent does audio tools and instructional materials enhance online instruction?” is multifaceted, and as presented above, it could be discussed at least from three different perspectives. In this paper, the attempt was made to highlight the implications and possible benefits for teachers, students and, administration and management policy in distance education from relatively simple audio based educational technology.

Thus, the main prerequisites for quality and effective integration of audio in online learning are associated with an adequate level of instructor’s skills in using audio devices (software) and competencies for managing the process production of instructional materials. Also, online language instructors must have the sufficient knowledge about the methods and techniques of teaching in an audio supported environment.

From the students’ standpoint, the integration of audio tools and instructional materials in online coursework contributes to the development of the social aspect of learning online. Audio adds important human dimension to relatively depersonalized web based language learning and is linked to higher student satisfaction toward the overall course activity and course instructor. As research has shown, audio improves student’s course performance and final outcomes (i.e. the cognitive aspect of learning).

Finally, the integration of audio technology in language courses may be a significant factor in the process of budget planning for distance courses. Undoubtedly, the expenses related to purchasing audio equipment, production of audio instructional materials, technical support, and teacher’s technology training, are concerns for every school management and policy makers in domain of distance education. However, fairly inexpensive audio devices, software, and maintenance of audio systems may decrease the costs and leave more room for the allocation of available funding towards the school’s investments in the area of distance education.

The audio tools in language education are not a novelty. However, it seems that the advantages of this relatively simple aid to online courses have not been fully recognized yet. The new generation of online instructors and school administrators should take into account the instructional value of audio tools if they want to develop more effective and efficient online language instruction.

References
