Improving Education Through the Integration of Multimedia

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IT 103, Section 007

Dr. Schorling

February 28, 2012

Introduction

Multimedia is becoming integrated into more aspects of society because it provides a user with multiple ways of gleaning information. This idea becomes very important within the scope of education. Classroom lectures, assignments and exams that employ multimedia often cultivate better student performance as it hones problem solving skills, invigorates student involvement and motivation, and can cater to the specific learning style of the student.

Background

Multimedia can be used in many different ways depending upon the subject area and academic level of classroom. There are, however, commonalities amongst all these contexts that multimedia addresses. For example, all students have a specific learning style which best enhances their ability to learn any subject, but it is difficult for a teacher to provide for all the specific styles of a classroom of twenty or more students. Because of multimedia's "video, audio, graphics and animation capabilities...[it] allows students to access information according to their own learning needs," making it useful in any kind of classroom (Zheng, 2009, p.175).

Another problem teachers are often presented with is a lack of motivation and student involvement in lessons and subsequent assignments. Because multimedia has "interactive affordances," it usually depends upon student participation and thus stimulating interest (Zheng, 2009,175). Finally, "multimedia projects allow students to gain skills beyond content-area knowledge" such as problem solving skills like "finding and interpreting information [and] articulating and communicating knowledge" (Ivers & Barron, 2006, 5-6).

Special Education Driver's Ed

One of the most complex educational environments has already proved to be able to benefit from the integration of multimedia into the classroom. A high school Driver's Ed course for students with moderate disabilities employed multimedia in lectures and exams with drastically improved student performance (Lee & Keckley, 2006, 5). The teacher created a power point presentation for lectures and exams which included "digital pictures and video segments on road signs and speed limits taken from the students' communities" (Lee & Keckley, 2006,3). This made the experience more "meaningful" and memorable for the students, because it was not merely a picture of a sign, but a sign in a familiar context (Lee & Keckley, 2006,6). The exams were conducted in the same format as the lectures and the students' test scores improved from an average of 45.2% to 94% (Lee & Keckley, 2006,5). This kind of improved performance fosters self-confidence in the students, a key element of success in special education.

Elementary School Physical Education

A classroom environment which might not obviously benefit from multimedia is physical education. In Greece, an elementary school utilized "multimedia and computer assisted instruction" in the health portion of the curriculum (Antoniou, Papaioannou, Laparidis, 2010, 1). The multimedia aspects included "colorful cartoons...digital narration and text, graphics (moving and static), digital audio and video" (Antoniou et al., 2010, 65). This is particularly useful in an elementary school setting, as "children are much more attentive to programs when animation and narration is used" (Antoniou et al., 2010, 62). The program's wide array of multimedia features creates a more individualized learning environment, which uses a student's own learning style to the best of its abilities, and because of this, can challenge the student more than "whole class or small group instruction in traditional approaches" (Antoniou et al., 2010, 71). The program's

interactivity is also consequential because it "encourages children to take an active role in the learning process" (Antoniou et al., 2010, 62).

Reading and Writing Skills

The ability to write and communicate ideas is necessary in society, but it is often one with which people struggle. Digital storytelling is "storytelling...conducted using...digital media in a computer network environment" (Xu, Park, Baek, 2011, 181). An educational environment can use multimedia in the form of digital storytelling to incite and nurture writing skills in students of all ages (Xu et al., 2011, 181). There are several different platforms in which to employ and view digital storytelling, one of the most common being a "virtual world" such as *Second Life* (Xu et al., 2011, 182). There are several "stages" of the writing process as laid out by the University of Houston's Instructional Technology department in their study on digital storytelling (Xu et al., 2011, 182). These stages include topic and selection, gathering of resources, identification of purpose, organization of content, creation and finalization of story and presentation (Xu et al., 2011, 182). All of these steps include the use of multimedia, and it is because the storyteller is not simply using text, but "image resources (pictures, drawings, photographs, maps)" and "audio resources (music, speeches, interviews, and/or sound effects)" that a student becomes more "involved with the digital world" and the writing process" (Xu et al., 2011, 182&189).

The results of this research show that students who took part in digital storytelling were not only more involved in the initial creation process, but also "paid more attention in revising their writing compared to the control group who did not make a digital story" (Xu et al., 2011, 184). The revision process is a complex one and the digital storytelling environment helps students understand and employ this process more effectively "by choosing appropriate words,

adjusting the sequence of sentences or removing sentences" while students in "the traditional writing group edited their writing merely by checking spelling and counting words"(Xu et al., 2011, 184). The interactive aspects of digital storytelling also "emphasize the active role of the student rather than the teachers" which helps motivate students (Xu et al., 2011, 183).

Students learning English as a second language can benefit from multimedia in reading and writing English as much as native speakers. Because "content becomes more abstract" with the increased level of language, non-native speakers often lack motivation in learning english (Masood, 2011, 1393-1394). This is evidenced in the fact that in one study, "Malaysian students are reluctant to read and they only read materials necessary to get their work done" as well as "memorize sample essays and...rewrite the essay they have memorized during the examination" (Masood, 2011, 1394).

The study on Malaysian students of English showed that multimedia presentations that included "dynamic visuals" as opposed to "static" ones helped strengthen student performance (Masood, 2011, 1399). Because students had the advantage of "visuals with audio and text... [they] were able to visualize better"(Masood, 2011, 1400). A more solidified visual is particularly important for learning because memories associated with pictures are more tangible than those associated with words (Masood, 2011, 1400). "Dynamic visuals" are also helpful in acquiring certain writing skills like description. The same study found that the students who were presented with a "dynamic visual" were able to describe ideas and places that appealed to at least three of the five senses whereas before the presentation, the "students were only able to focus on the sense of sight" (Masood, 2011, 1400). With a better grasp on concepts like vocabulary,

students are more capable of understanding more complex and "abstract" concepts of English, and thus more motivated.

E-Portfolios

Very similar to digital storytelling is an e-portfolio, which "enable students to collect work and reflections on their learning through text, imagery, and multimedia artifacts" (Fischman, 2009). The students use multimedia to present a "student's accomplishments and activities" such as "papers, problem sets, pictures from study-abroad stints" as an "extensive resume" for potential employers (Young, 2002). The positive effects of using multimedia in this way are also similar to those of digital storytelling in that "students in ePortfolio classes... are more likely to demonstrate high degrees of engagement in critical thinking, writing, and collaborative learning" (Fischman, 2009).

Conclusion

Classroom lectures, assignments and exams that employ multimedia often cultivate better student performance as it hones problem solving skills, invigorates student involvement and motivation, and can cater to the specific learning style of the student. It is because of these capabilities that multimedia can provide benefits in many different educational contexts. Though it is better suited for "academic-related content," multimedia involves such a diverse way of thinking that it can enrich skills that reach beyond the classroom and into daily life.

References

Antoniou, P., Papaioannou, A., & Laparidis, K. (2010). Effects of multimedia computer-assisted instruction (MCAI) on academic achievement in physical education of Greek primary students. Digital Education Review, 0(10), 61-77. Retrieved February 15, 2012, from http://greav.ub.edu/der/index.php/der/article/viewArticle/92

This article showed that even younger students can benefit from multimedia-enhanced education. Although its screenshot was not very indicative of the way the program worked, the article did provide a diagram of all of the different possible pathways of experiencing the program from the student's perspective.

Fischman, J. (2009, March 18). Electronic portfolios: A path to the future of learning [Web log post]. Retrieved February 26, 2012, from http:chronicle.com.mutex.gmu.edublogs/ wiredcampus/electronic-portfolios-a-path-to-the-future-of-learning/4582

Not only did this source help because it was a third different kind of source, but it also showed me an aspect of multimedia-based projects about which I was not knowledgable, and was related to my paper.

Ivers, K. S., & Barron, A. E. (2006). Multimedia projects in education: Designing, producing, and assessing. Westport, CT: Libraries Unlimited.

This source gave valuable information on the cognitive aspects of learning and how multimedia benefits a student's learning experience. While this source used less generalized research about multimedia and education, it used much more accessible language than some other, more analytical resources.

Lee, Y., & Keckley, K. (2006). Effects of a teacher-made multimedia program on teaching Driver Education. TEACHING Exceptional Children plus, 2(5). doi: http://journals.cec.sped.org/tecplus/vol2/iss5/art5

This article presented the research with screen shots of the multimedia program used in the study, which helped me understand the extent of the program and how it affected the students.

Mona, M. (2011). Descriptive writing: Does dyanmic visual help? Global Learn Asia Pacific 2011, (1), 1391-1401. Retrieved February 20, 2012, from http://editlib.org/p/37348

This was a useful article because it showed how multimedia is beneficial in an environment that would find it essential. It didn't give as much information about the actual study as I would have liked, but it gave enough about the results so that I could compare "dynamic" and "static visuals."

Xu, Y., Park, H., & Baek, Y. (2011). A new approach toward digital storytelling: An activity focused on writing self-efficacy in a virtual learning environment. Journal of Educational Technology and Society, 14(4), 181-191.

Although this article did not give me as much information as I would have liked about how digital storytelling affects the classroom, it was a very interesting study. It described the experiment in great detail which was very helpful in understanding how it affected the students in the study.

Young, J. R. (2002, February 21). Creating online portfolios can help students see 'big picture,' colleges say. The Chronicle of Higher Education. Retrieved February 26, 2012, from http://chronicle.com.mutex.gmu.edu/article/Creating-Online-Portfolios-Can/116026/

Although this article was published ten years ago, it gave background information on a subject still relevant in today's discussion of technology in the classroom. This is apparent because several other articles written within the past two or three years were in response to this original article.

Zheng, R. (2009). Cognitive effects of multimedia learning. Hershey, PA: Information Science Reference.

This source gave very specific, empirical information about the effects of multimedia on learning. Though the language was very dense, the research provided made it an authority on the subject of education.