

# Audio Design and Visual Design in Digital Video Production

Ruth Xiaoqing Guo, Ph.D.  
Buffalo State College

## Abstract

This study examined the possibilities of integrating multimedia into digital video to strengthen student learning. Digital video products have been used more often in educational settings. Students in educational programs are motivated to create digital video products. However, some of the students are facing challenges in audio and visual designs in digital video products to meet student different learning styles. This study is aimed to address the issues and challenges in audio design and visual design in digital video products. Findings showed that mastering audio design and visual design in digital video products helped students develop their technological skills and build their confidence in integrating multimedia into different formats of digital products.

## 1. Introduction

This paper reports on the pedagogy of integrating multimedia into digital video products in the teacher education programs at the University of British Columbia, the University of Ottawa, Canada, and some of the video products by graduate students in a graduate program at Buffalo State College, Buffalo, New York. Technologies and new multimedia have provided more opportunities for both instructors and students to observe and reflect on student progress in learning.

Videotaping student presentations has been recognized as an excellent vehicle for improving student performance since Allen (1969) and his group in the 1960s applied this approach in Harvard University to improve the skills of teacher candidates. This pedagogy has been employed in the teacher education program at the University of British Columbia for over 10 years. In this study, students were encouraged to use one of the technologies – through the lens of video cameras to develop a deeper knowledge of their teaching practices. In order to reduce the complexities involved in teaching, the students were asked to deliver two presentations. The first one was delivered in groups of two and the second presentation was an individual presentation. Each of the presenters was required to introduce an educational software program in the first presentation for about five to seven minutes. The second presentation was eight to 10 minutes, with the presenter being asked to integrate the software application into curriculum. Both of their presentations were taped and edited into movies and then put into their project e-portfolios as one of their components. When dealing with video data, the students had

challenges in managing audio effects, particularly, to match the audio and visual rate during video editing.

The purpose of collecting videotape data of student presentations and digital video products was to gain an in-depth understanding of the process of students' digital video production. This study was aimed to investigate the following research question:

What are the essential components that students need to know in digital video production?

## 2. Theoretical Framework

Video production has become a widely known technique in education. Technologies and new multimedia have provided more opportunities for both educators and students to observe and monitor presentations. Not using technology in the classroom could deprive students of access to valuable information, ideas and tools for knowledge construction and sharing (Doyle, 1992; Ely, 1996; Gabler & Schroeder, 2003). Gabler and Schroeder address that successful classroom integration of technology depends on a larger context that involves the pedagogical settings. This pedagogy grew out of the audio-visual (AV) movement in the 1930s when educators stressed that media such as slides and films delivered knowledge information in more concrete and effective ways than through lectures and textbooks. The AV movement produced the “branch of educational theory and practice concerned primarily with the design and use of messages that control the learning process” (Saettler, 1990, p. 9). For instance, Farwell (2008) states that visual learners benefit from graphics, pictures, films, and written instructions; auditory learners are those who learn best through hearing things. Learners may struggle to understand a chapter they have read, but then experience a full understanding as they listen to the instructions, stories, and music. Farwell also argues that many of these techniques, however, also benefit kinesthetic learners.

Approximately 20 to 30 percent of the school-aged population remembers what is heard; 40 percent recalls well visually the things that are seen or read; many must write or use their fingers in some manipulative way to help them remember basic facts; other people cannot internalize information or skills unless they use them in real-life activities such as actually writing a letter to learn the correct format. (Carbo, M., Dunn, R., & Dunn K., 1986, p. 13)

From an educationally philosophical point of view, Gardner's (1993) Theory of Multiple Intelligences has

implications for teachers to apply technology and to cater individual learning needs and different learning styles. Gardner used biographies to illustrate that each person has a range of intelligences. He argued that everyone is born with eight intelligences but develop different sets of capabilities, which means that each person has a unique set of intellectual strengths and weaknesses. Gardner argued that all intelligences are equally important and they rarely operate independently. Educators recognize that the integration of a wide range of intelligences reflects multiple ways of knowing and successful integration of technology into curriculum responds to students' distinct learning styles and the development of multiple intelligences (Gabler & Schroeder, 2003; Petrina, 2003). Technologies, particularly multimedia, blend diverse types of media to facilitate different learning styles (see Figure 1, Multiple Intelligences).



Figure 1. Gardner's Multiple Intelligences

The Theory of Multiple Intelligences has implications for classroom teaching with technologies. In line with Gardner's theory, the New London Group (1996) coined "multiliteracies" to include linguistic design, audio design, spatial design, visual design, and gestural design, providing a solution to problems that traditional educational systems overlooked. Multiliteracies are designed to overcome limitations of traditional approaches. The New London Group (1996) argues that the multiple linguistic and cultural diversities in our society are the core pragmatics of the working, learning, and private lives of students, and that the use of multiliteracies will empower students to achieve success in learning. Multiliteracies focus on special cognitive, cultural, and social effects of representation rather

than language alone since "the days when learning a single set of standards or skills to meet the ends of literacy are gone" (Cope & Kalantzis, 2000, p. 42). Multiliteracies include six design components: linguistic meaning, visual meaning, audio meaning, gestural meaning, spatial meaning, and multimodal patterns of meaning "that relate the first five modes of meaning to each other" (Cope & Kalantzis, p. 42). Therefore, the focus of multiliteracies is making learning experience meaningful.

Technologies play a very important role in representations of natural sounds and music. The use of CDs and DVDs with iMovie (a simple, easy to use video editing program that comes free with the Apple operating system) and Movie Maker (a video editing program that comes free with the Windows operating system), greatly enhance the development of audio and visual design and end products.

### 3. Method

An ethnographic approach was employed for detailed interpretations. The data collections were from three institutions in USA and Canada. They included video tape recordings of graduate student presentations and their video products in the graduate program at the Buffalo State College, State University of New York, USA; video products by the pre-service teachers from the teacher education programs at the University of British Columbia (2003 to 2006 academic years), the University of Ottawa (2006/2007 academic year), Canada. Sources were derived from students' video assignments and videotapes from graduate students' videotapes of their presentations. Video products included the projects for individual studies and for the course work in 2007-2008 academic year in the educational technology program at Buffalo State College and the other two educational institutes in Canada.

As Salzman and Rice (2008) stress ethnography is a complex, interrelated system of meaning with different levels of understanding and multiple alternative interpretations. Addressing any particular ethnographic fact...field work methodology or epistemological presumption implies reference to other facts, theories, modes, methodologies, and presumptions and leads one up and down to different levels of understanding and other interpretations." (p. 3).

Bearing this in mind, the author of this study kept her mind open that wherever the study began, whatever the research questions focused on, this study might end up with some other findings as ethnography provides a great circle of opportunities.

### 4. Findings and Discussions

All the videotapes of the students' presentations and digital video products were examined. For most students, creating digital video products is more engaging than writing, and the



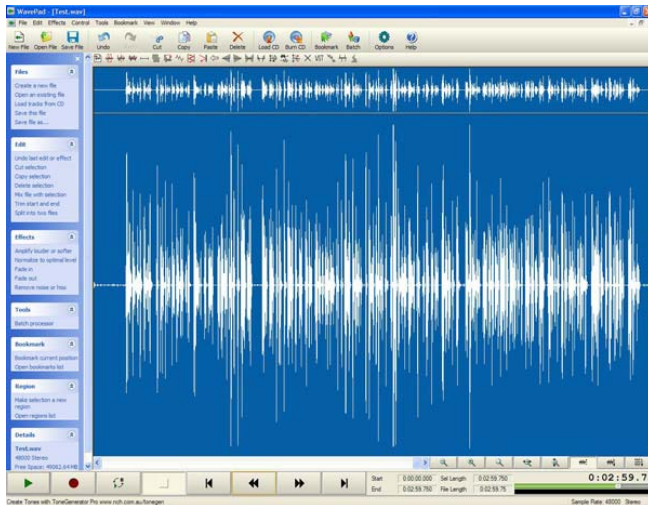


Figure 3. Voice editing using WavePad

WavePad also supports sample rates from 6000 to 96000Hz, stereo or mono, and 8, 16, 24, or 32 bits. The following example (Figure 4) selected attributes 8 kHz, 8 Bit, Mono as the saving format in Wave.

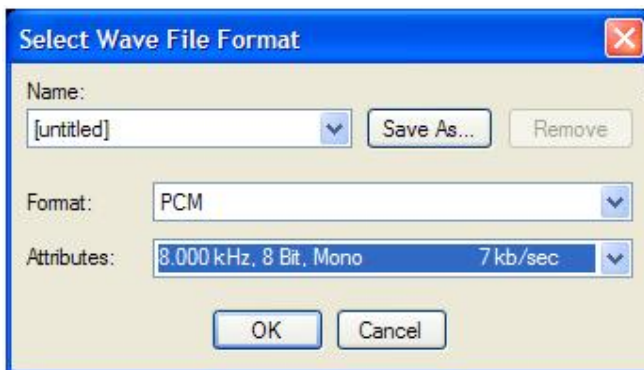


Figure 4. Saving an audio file using WavePad

After the audio file is saved, it is ready to be imported to Movie Maker in PC or iMovie in Mac to put into a video product. The working environment for video editing using Movie Maker is shown in Figure 5.

The strategy of putting audio into a video product will encourage students to make connections between what they are hearing and what they are learning. It will also help students to develop musical intelligences.

#### 4.2 Visual Design

Some students failed to edit properly for one or more than one of the following tasks regarding visual design:

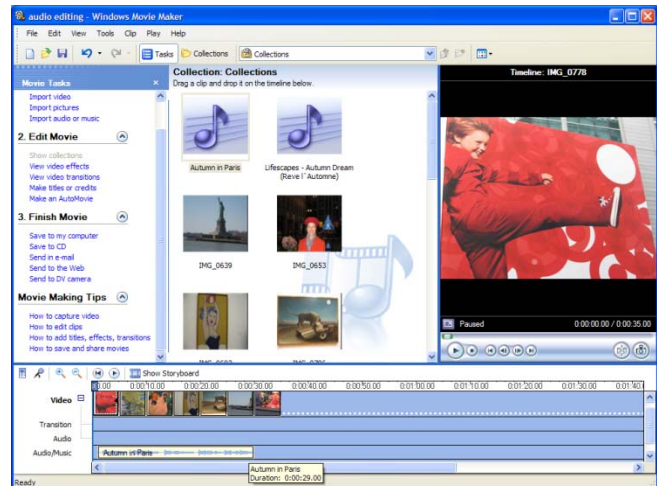


Figure 5. Video editing using Movie Maker

1. Adjusting the timing of dialogue and action to create sequences that move effectively;
2. Enhancing the point content by underlining, shading, or even changing the original meanings; and
3. Directing viewers to the most important aspects of the shots.

One of the major reasons is that the students did not have a good control of “frame,” which is a single video image in a series of movements in video. According to Stinson (2008), a frame is a powerful communication channel between the video maker and the viewers as the frame determines what the viewer sees. The term “frame” has two different meanings: the border around the screen and a single file or video picture. Video is typically displayed at 30 frames per second.

Some of the frames in the students’ video products were not stable because the footages were not technically competent. While shooting, some students swung the camera around to center one subject, and then another, and then quickly to another, instead of getting a good-looking picture of each subject and shooting it as a separate shot. Some students made shots too brief, i.e., less than three to five seconds as a minimum length for a subject that was being shot. So it did not allow viewers to have time to look at the frames. When videotaping, most beginners did not allow extra room ahead of a moving subject. Instead, the moving subject was positioned to be close to the frame edge. In these cases, even if there was only one subject in the frame, it looked crowded.

Suggestions for the above issues include:

- Use a tripod when shooting to obtain stable footage.
- Avoid moving the camera around frequently.

- Use frames to control the point content by making decisions on what to include and what to exclude in frames.

In addition to use footage as a source of video products, still images can also be inserted into a video. For example, the image of a boy kicking a ball in Figure 5 was a still image that the author retrieved with a still camera from a street wall in Manhattan in New York City. It reflected the vivid city life of New York City. It was inserted into the video “Hello New York” as a teaching module. Students liked it and were inspired to be creative. As most educators and researchers agree, visual design can help students develop linguistic intelligences, particularly help students who are visual learners.

### 5. Conclusions

This study identified aspects of video production in its investigation into the research question as to what are the essential components that students need to know in digital video production. The study found support for a positive impact of technology. Most students developed interest in digital video production, although they faced some challenges during the video editing process. The video ethnographic approach facilitated students’ professional development. From all the students’ work on videos, it brought to the author’s attention that the students need more theory and practice in audio design and visual design to improve the quality of their digital video productions. Audio design and visual design are the major areas in digital video production that the students need to work on along with some other designs. Another suggestion for professional improvement in this area includes instructors providing models for the target assignments so the students have examples to follow. Perhaps a course on “Digital Video Production” is one solution.

### References

- Allen, D., & Ryan, K. (1969). *Microteaching*. Menlo Park, California: Addison-Wesley Publishing Company.
- Carbo, M., Dunn, R., & Dunn K. (1986). *Teaching students to read through their individual learning styles*, Englewood Cliffs, NJ: Prentice-Hall.
- Cope, B., & Kalantzis, M. (2000). *Multiliteracies: Literacy learning and the design of social futures*. New York: Routledge.
- Doyle, W. (1992). Curriculum and pedagogy. In P. Jackson (Ed.), *Handbook research on curriculum* (486-516). New York: Macmillan.

- Ely, D. P. (1996). *Trends in educational technology*. Syracuse, NY: Syracuse University.
- Farwell, T. (2008). *Visual, auditory, kinesthetic learners*. Retrieved on September 16, 2008, from <http://school.familyeducation.com/intelligence/teaching-methods/38519.html>
- Gabler, C., & Schroeder, M. (2003). *Constructivist methods for the secondary classroom*. Boston: Pearson Education
- Gardner, H. (1993). *Multiple intelligences: The theory in practice*. New York: Basic Books.
- New London Group (The). (1996). A pedagogy of multiliteracies: Designing social futures. *Harvard Educational Review*, 66(1), 60-92.
- Petrina, S. (2003). The educational technology is technology education manifesto. *Journal of Technology Education*. 15(1), 64-74.
- Saettler, P. (1990). *The evolution of American educational technology*. Englewood, CO: Libraries Unlimited.
- Salzman, P., & Rice P. (2008). *Thinking anthropologically*. Upper Saddle River, NJ: Pearson Education LTD.
- Stinson, J. (2008). *Video: Digital communication & production*. Tinley Park, Illinois: The Goodheart-Willcox Company.

### Acknowledgements

This document was based on research in the Computer Information Systems Department at the Buffalo State College, State University of New York, USA; Teacher Education Programs at the University of Ottawa, the University of British Columbia, Canada.

### Author Information

Ruth Xiaoqing Guo, Ph.D.  
 Assistant Professor  
 Educational Computing Program  
 Computer Information Systems Department  
 Buffalo State College  
 Chase 225  
 1300 Elmwood Avenue  
 Buffalo, NY 14222  
 716-878-5919  
[guorx@buffalostate.edu](mailto:guorx@buffalostate.edu)

Ruth teaches graduate courses to K-12 teachers, especially concerning the application of computer technology and integration of technology into curriculum. Ruth’s research interests include integrating technology into curriculum, digital divide, constructivist pedagogy, video ethnography, multiliteracies, information and communication technology (ICT) literacy, and ICT assessment. She has published research papers and book chapters in these areas.