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PROCEEDINGS
FROM THE THIRD NATIONAL SYMPOSIUM
ON MUSIC INSTRUCTION TECHNOLOGY
JULY 13-14, 2001

Sponsored by the Auburn University Department of Curriculum and Teaching, The Florida State University Center for Music Research, The School of Music at the University of Oklahoma, and the Music Educators National Conference

The National Symposium on Music Instruction Technology was held July 13 - 14, 2001, at the Auburn University Hotel and Conference Center, Auburn, Alabama. The ongoing theme of the conference was "Practice and Research." The symposium was a project of the Center for Music Research at Florida State University, the Music Education Program of Auburn University, and the School of Music at the University of Oklahoma. The symposium was co-sponsored by MENC.

Music educators and music education researchers shared knowledge and experiences concerning technology enhanced music instruction. The goals of the symposium were to (a) accelerate the exchange of ideas among practitioners and researchers, (b) to encourage appropriate uses of music technology in PreK-12 learning environments, and (c) to disseminate findings of investigations into learning with music technology.

The following pages are summaries of the symposium presentations. Several presenters also submitted article-length research manuscripts that were reviewed for potential publication in the *JTML*. Dr. Barry's full-length reviewed article is in this issue of JTML. Dr. Price and Dr. Pan's article appeared in Volume 1, Issue 2.

The Fourth National Symposium on Music Instruction Technology was held June 6-8 2002 at the University of Oklahoma. The Fifth National Symposium on Music Instruction Technology recently was held (June 26-28, 2003) at Illinois State University, organized by Dr. Kimberly McCord. The 2004 National Symposium will be held in Valley City, North Dakota, Dr. Sara Hagen, organizer (see announcement at the end of this issue). Information for upcoming and past Symposia is available at http://www.auburn.edu/musiceducation/NSMIT.

Music Educator Computer Technology Use in Alabama, Florida, and Georgia

John Jinright, Troy State University

This presentation described preliminary results of a Music Educator Computer Technology Use survey that was mailed to a random sample of 1,895 music teachers in Alabama, Georgia, and Florida who were members of MENC. The survey was part of the presenter's in-progress doctoral dissertation study.

Most of the music teachers reported in 2000 that they would not, or likely would not use a computer in classroom instruction on an average day. Only 9% of Alabama respondents, 19% of Florida respondents, and 17% of Georgia respondents reported that perhaps they would, or probably they would use a computer in a class on an average day.

The average age of the respondents was 42.5 years and the average number of years teaching was 14. There was a significant different in education level of the respondents, $F(2, 549) = 16.57, p = .00$. Florida music teachers held fewer advanced degrees than Alabama and Georgia music teachers.

Significant differences were not found between states in the number of schools in which the music teacher teaches, the number of students taught in an average day, nor the number of classes taught per day. However, there was a significant difference in the class size, $F(2, 547) = 8.63, p = .00$. Alabama mean class size of 53 was greater than Florida's class size of 46 and Georgia's average class size of 42.

When asked about computer ownership, 89% of the teachers responded that they have a computer at home, 92% have a computer to use at work, and 57% have a computer at work that is accessible for student use. Over half of the teachers in each state reported that they use a computer at home 1 to 5 hours per week.

Fifty percent or more of teachers reported that they had access to the following types of software and hardware: notation (70%), sequencer (50%), MIDI interface (50%), sound card (65%), and CD-ROM drive (89%). Other types of applications were less frequently available: MIDI controller (27%), synthesizer or keyboard (49%), drum machine (14%), digital audio software (17%), digital audio hardware (11%), MIDI librarian/patch editor (11%), multimedia authorware (13%), instructional CD-ROMs (40%), sound module (34%), eartraining software (28%), and theory software (38%).

Ninety-eight percent of teachers had Internet access and 89% of schools had Internet access for students. Regarding uses of the Internet, 44% of teachers reported that it was used for assignments, 9% for a teacher Webpage, and 30% for a school Webpage. Only 6% reported actually using the Internet in their teaching.

Other findings:

1. 90% of teachers had only 2 or fewer computers for student use.
2. 31% reported no funding available for their technology needs.
3. 36% reported poor funding for technology.
4. 36% said that performance expectations limit their adoption of technology.
5. 46% found available software to be less than adequate for their needs.
6. 75% reported that learning to use music software was little or no problem.
7. 84% of teachers knew at least one other teacher who incorporated technology into the music classroom.
8. 60% never received computer training in college.
9. 10% said that the quality of their university technology instruction was poor.

A factor analysis showed that there were 5 factors most strongly related to predicting whether a music teacher was a "computer user" or not: school environment, teacher experience, access to technology, teacher training, and suitability of technology to curricular goals.

Technology for Real Middle School and High School Bands

Kimberly C. Walls, Auburn University
Joy Brinkley and Shannon Chandler,
W. F. Burns Middle School and Valley High School
Myra Rhoden, Booker T. Washington High School

Teachers are encouraged to use technology in their teaching and have students use the technology themselves; however, technology should not be used unless it makes new learning possible or makes learning more efficient. When school ensemble conductors must manage large groups of students, it is not clear how all the students may have time to use technology.

This presentation described how two band programs in our area provided their students unique ways of learning music through technology. Kim Walls has been privileged to observe these band directors as they followed their ideas for instruction from the proposal stage through implementation. This presentation included video clips of their students in action using music technology and vignettes of the students assessing their learning experiences. Summaries of what the students and the teachers have told Walls about the experiences were presented. Then Chandler, Rhoden, and Thomas answered Symposium participants' questions about what it is like to implement technology in band rehearsals.

Initially we observed the band program at W. F. Burns Middle School and Valley High School in Valley, Alabama. At the time of the presentation, Shannon Chandler had been band director in Valley for 11 years, teaching at both schools, and Joy Brinkley had been teaching at both schools for 3 years. Shannon and Joy have a productive professional relationship in which each of them assists the other in their schools. They team teach middle school and high school band.

Joy and Shannon have implemented at least two applications of technology in music learning for band students. Each school has an Amadeus pitch-to-MIDI converter system that students use for performance assessment. The Amadeus system consists of hardware and software that accepts audio information, converts it to MIDI, and compares the performance data with music that is programmed into the system. The software then assigns the student a grade based upon pitch and rhythm tolerances preset by the teacher. The system was delivered with scales and exercises from the Standard of Excellence Method Books. The Amadeus Tutor program allows teachers to input any type of music via MIDI into the system for students to perform.

Joy and Shannon have used Amadeus for students' individual pass-offs of scales and method book exercises. This is an efficient way for students to receive feedback on their performance and is an efficient means of grading. Anyone who has graded student performance tapes or tried to schedule enough private lesson times for their ensemble members would find this option attractive. Another way Joy and Shannon use music technology is to create and distribute MIDI files of students' band parts for practice at home. They have discovered that many of the students find the aural models valuable for learning to perform concert music and that they enjoy their home practice more.

At this point some video clips from Burns Middle School were played. In the first clip, Joy demonstrated and explained how Amadeus works. In the second video vignette five young ladies from the W. F. Burns Middle School Band discussed using Amadeus. They described what was it like to use Amadeus the first time in band testing and their general perceptions concerning the use of the program. They all reported that the system is easy to use: "If you can use a computer, it's easy." They also said that they preferred playing their tests for the system in the band director's office instead of playing in front of their peers during rehearsal. Joy and Shannon had worked out a schedule so that each student had two 7-minute blocks of time per week when they were scheduled to leave the large rehearsal to perform their pass-off assignments. In the third video episode the girls were asked about using the MIDI files for home practice. They reported that they found the MIDI files easy to use and helpful for improving their performance. In fact, some of them reported that they still used the files to practice "old" music. In the last clip, Jessica, a middle school band member, played a scale into the Amadeus system.

Two years earlier, Myra Rhoden discovered a grant opportunity for obtaining technology equipment. She had definite ideas about what she wanted to be able to do for her students. Several of her students had expressed interest in composing and arranging music for the band at Booker

T. Washington High School. She wanted to obtain technology that students could use during band rehearsals to learn about composition independently. Consequently, Myra and Walls wrote a grant proposal and the school was awarded $5000 to purchase four computers, MIDI keyboards, and the following software: Band-in-a-Box, Sibelius, and Music Ace. Over the past two years, several band students have worked with the hardware and software to develop their composing skills. Some of their compositions were performed by the band. There is no doubt that these students have learned more about music through these experiences.

A videotape was presented in which the participants met three of the students of the Booker T. Washington Band who had been using the technology. The three band members introduced themselves and explained why they became interested in learning how to compose. Then they used Sibelius and a MIDI keyboard to perform their compositions. In the next video, the students discussed how they learned to use the notation software and MIDI keyboards for composition. Again, they claim that the software was "easy" to learn.

These three teachers have found ways to enhance student musical learning. It is impressive that they valued these individualized learning experiences enough to allow their students to leave rehearsals for small amounts of independent learning. It is easy to determine from student comments that band directors Brinkley, Chandler, and Rhoden facilitated these students' abilities to learn independently. Although the students say "it was easy" and the teachers made it appear easy, they did a lot of work to make it happen for the students. First, they had to have the idea: "Technology could help my students if. . . ." Then each teacher had to find a way to obtain the hardware and software that they needed. Then after the equipment arrived, they had to find locations for the equipment to be used, and they had to install all of the parts.

In addition to all the complications of setting up the software and equipment, Myra spent time outside class to listen to the composers' works and give them feedback. Although they learned a lot about music notation from working with Music Ace and Sibelius, they excelled because they had support from the other composers as well as from their band director. Another important aspect of Myra's participation in their learning is modeling. The students could observe her using Sibelius to arrange music that they played in band performances. Thus, not only did she encourage and direct their composition, she modeled behavior and shared her work with them.

Shannon and Joy had to select musical examples for assessment and enter them into the software. They also had to demonstrate and explain to the students how to use the technology. They developed a schedule for assessment and implemented it. They also had to explain the new teaching technique to parents and administrators. Even with score scanning software, they spent considerable time creating MIDI files for students to take home.

Conclusions

Based upon her interviews with the directors and videotaped students, Walls presented the following important considerations for integrating technology into band programs.

1. The teacher must be thoroughly comfortable with hardware and software.
2. Students need time to work independently.
3. Allow make-up schedules and/or extra time outside of class.
4. Teacher acts as facilitator, and asks questions when students request feedback.
5. Teachers model technology and musical skills and activities.
6. Logistics of time, space, and technical support are important aspects.
7. Students think technology is easy to learn.
8. Students enjoy performing with/for computer.
9. Students practice more (performance and composition).
10. Communication among the working group and teacher facilitates individual learning.

At the end of the presentation, participants asked questions of Joy, Shannon, and Myra about how they implemented their systems and overcame obstacles along the way. These band directors gave their assessments of the effectiveness and efficiency of using technology in these ways and pointed out things they would have done differently.

Software/Hardware

Amadeus al fine: $499 (Win 95/98 or Mac OS 7/8 with serial port) and *Amadeus Tutor*: $295. See http://www.pyware.com/amadeus.html

Band-in-a-Box Pro $88. See http://www.pgmusic.com/

Music Ace: $49.95. See http://www.harmonicvision.com/

Sibelius: $299 and *Sibelius 5-pack*: $899. See http://www.sibelius.com/#3

The Internet as a Means of Assessing the New Jersey Core Curriculum Content Standards in Music: A Research Report

James Frankel, Franklin Avenue Middle School

This session is a follow-up to Frankel's presentation at the 2000 NSMIT. The results and implications of the research are discussed in this session. At the time of the presentation, Frankel was a Doctoral Candidate at Teachers College, Columbia University. By sharing the Doctoral Dissertation research project that he was in process of completing, he hoped to provide music educators with ideas for creating alternative assessment Web sites for music, specifically in regards to standards based assessment, and to show whether or not the Internet is a valid assessment tool.

There were 22 schools across New Jersey, representing over 400 students, which participated in the study. Each school had one class of fourth, eighth- or twelfth-graders completing online assessment activities in fulfillment of the New Jersey Core Curriculum Content Standards in Music. The teachers submitted student work for assessment, using the Performance Standards for the National Standards in Music Education. Students submitted audio, visual, and written work for assessment as opposed to the traditional standardized testing method. This assessment Web site, titled MusicAssessment.com, contained 18 assessment activities. The data described what types of activities worked, and what types did not. Student work and all of the features contained on the site were displayed.

Overview of the Session

Standards Assessment: Traditional vs. Performance-Based

- What are the advantages and disadvantages of each?
- Which assessment type more accurately reflects student understanding in music?
- What does the assessment for some of the State Standards in Music look like?
- What are the positive and negative aspects of each?
- What will the results of the assessment mean for our music programs?
- What role can technology play in assessment?
- What are the advantages and disadvantages of each?
- How can the Internet be used as an assessment device?

Explanation and Demonstration of www.MusicAssessment.com

- Background on the mechanics of creating the site
- Overview of the site, its features and functions
- Presentation and explanation of some of the activities contained on the site, at least one from each of the three grade levels
- Examples of submitted student work will be shared
- Discussion of the grading rubric and the feedback aspect of the site

Analysis and Results

- Data from teacher questionnaire
- Number of hits
- Amount of student work assessed
- Time spent grading work to be assessed
- Time spent by teachers submitting student work
- Technical difficulties
- Cost factor
- Feasibility of statewide use
- Questions for further research

Conclusion

A discussion followed concerning the concept of Internet assessment in the music classroom, results of the data analysis, and the feasibility of using it at the state and national level.

Multimedia Uses of Microsoft Word and PowerPoint

Jane M. Kuehne
Center for Music Research, Florida State University

In contemporary times, educators are most often expected to use computers and software to enhance student learning. While this is the expectation of school districts, only sometimes the hardware and software that is provided seeks to meet the needs of music educators and students. Furthermore, with budgetary restrictions that some music programs have, purchasing new and often unfamiliar equipment and software is unrealistic.

Because of the many uses of Microsoft Office, it has become somewhat of a standard in educational settings and is familiar to many people. There are two components of Office that educators and students are utilizing in the classroom, Word and PowerPoint. These two components can be used in many ways, including several multimedia applications. The purpose of this paper is to inform music educators of practical multimedia applications for Word and PowerPoint software.

Recording Sound Clips

Using the Windows Sound Recorder will allow recording of short excerpts without an additional purchase of software. While it may not be the highest quality of recording, for most beginners it should be adequate. The quality of recorded clips depends upon the preferences and room ambiance. For the best quality, the recording and playback qualities should be converted from the default to at least CD quality (44,100 Hz, 16 bit stereo).

To change the properties in the Sound Recorder, click File>Properties. The Properties for Sound window will appear. At the bottom, select All Formats and click <Convert Now>. The Sound Selection window (Figure 1) will appear. Under Name, find the quality of sound that is desired (CD/Radio/Telephone) and then click <OK>. From the previous window click <OK> and the properties will be changed. To record, use a microphone and press the red record button as if using a tape recorder or other recording device.

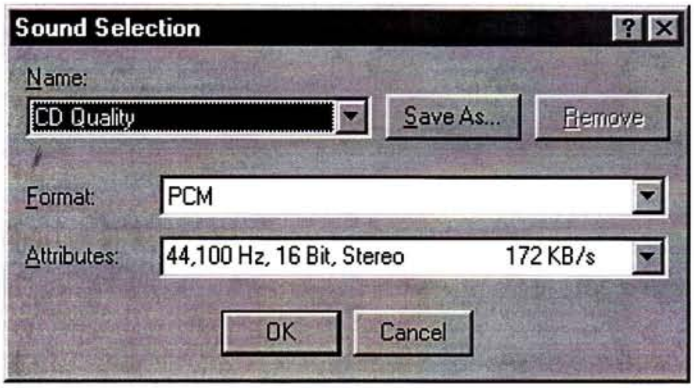

Figure 1. Sound Selection window for the Windows Sound Recorder. Users can change the quality of playback and recording.

Inserting Media Clips

Using Microsoft Word and Microsoft PowerPoint, educators can create customized pages that can be used repeatedly. Furthermore, once the work is completed, it is available with the click of a mouse, allowing more time to move to new projects. Inserting media clips into Word and PowerPoint documents enhances presentation and puts the tools needed to teach a topic in one place. The following is a description of the steps needed to insert an existing media clip (sound or video) into a Word document. The process is the same for PowerPoint.

To insert a media clip, click Insert>Object on the File Menu. The Object window (Figure 2) will appear. From this window, select the type of object to be inserted. Under Create New, select Media Clip. Check "Display as icon" to create an icon which will serve as a link to the media file. Double clicking the icon in the original document will allow immediate access to the media clip. Clicking <OK> will move to the next step.

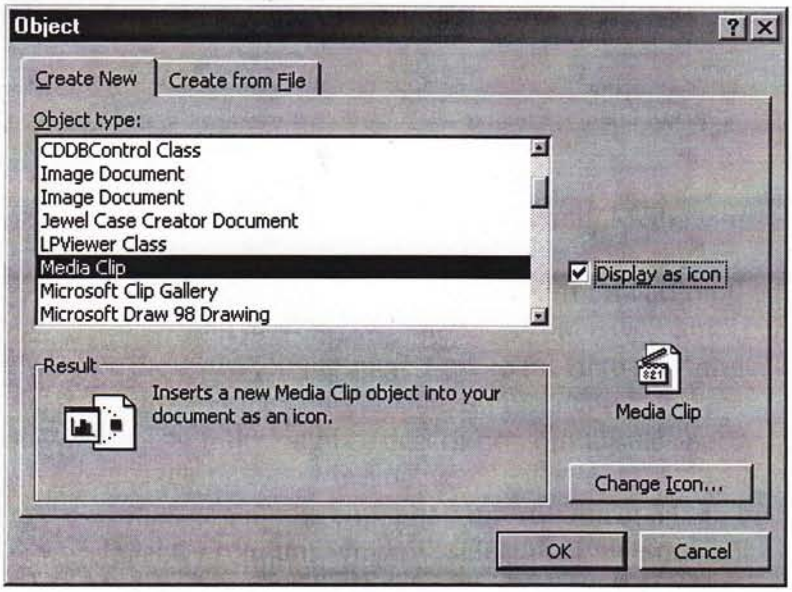

Figure 2. Object window where users can choose the type of object to insert.

When the icon is double clicked in the original document, the Media Player (Figure 3) should appear. For the icon to link to a specific file, on the media player click File>Open and select the desired file. Once a file has been selected and opened, the original document must be updated. On the media player, click File>Update Document and then save the original document.

Figure 3. Media Player where the user can choose the file to play and update the document.

Inserting Hyperlinks

Similar to inserting a media clip, creating hyperlinks in documents can be valuable. Using hyperlinks, educators will be able to create interactive media pages that require little effort from students. In addition, educators can use previously created documents on a computer in place of the overhead projector and/or stereo equipment, depending on setup.

To create a hyperlink, on the File Menu click Insert>Hyperlink. The Insert Hyperlink window (Figure 4) will appear from which a target file can be selected. First, at the top of the window, type the text to display for the hyperlink. Next, select a target file. After selecting the target file, clicking <OK> will complete the process. The hyperlink text will appear as linked text does in an active Webpage (usually blue and underlined), and a hand will appear when the mouse is on the text.

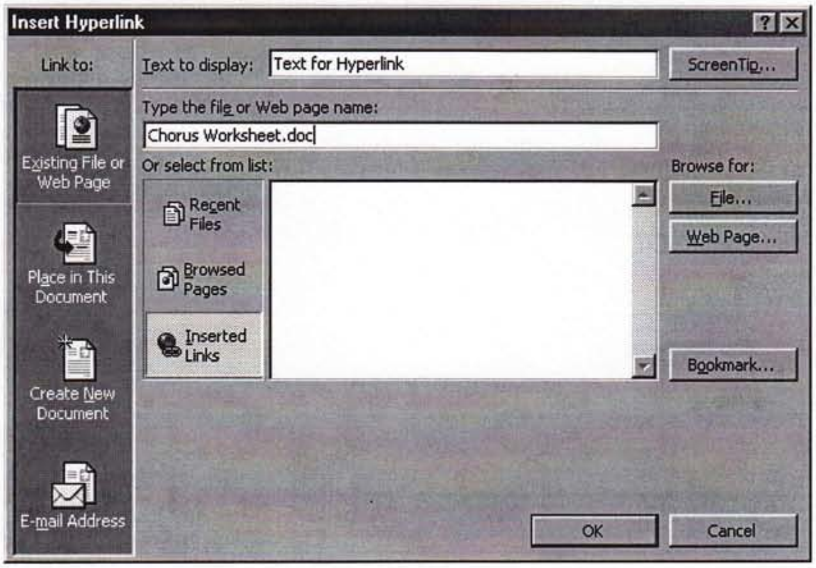

Figure 4. Hyperlink Window, where the user can choose a target and edit the text for creating a hyperlink.

PowerPoint Presentation Development

Learning can be reinforced or student-initiated with well-developed PowerPoint presentations. Important factors to consider when developing a presentation to be used with students are student age and ability levels as well as their interests. Because of the time involved in creation, presentations should include material that will be used repeatedly or extensively, using some form of multimedia. Two effective media tools for communication are photographs and sound. Photos and authentic sounds provide variety and allow students another path for gaining information.

Another important factor to consider is presentation order, or learning sequence. For example, an historical presentation should follow historical events in order of occurrence. Similarly, educational presentations should be presented in learning sequence order, rather than random. The primary use for the presentation should be to convey correct and appropriate information to the students (or other audience).

Inserting Sounds into PowerPoint Presentations

To create unique presentations, inserting pictures and links to sounds is suggested. To insert a link to a sound onto a slide, on the File Menu click Insert>Movies and Sounds>Sound from File (all on the same menu). Select the desired file and click <OK>. A speaker icon will appear on the slide. The software may ask whether or not to play the sound automatically. Choosing <Yes> will make the sound play whenever the slide is opened. Choosing <No> will allow the user to click the icon to hear the sound clip.

Inserting Pictures

To insert a picture into a PowerPoint presentation (the process is the same in Word), on the File Menu click Insert>Picture>From File. Select the file to insert and click <OK>. The selected picture should appear in the slide. Subsequently, editing of size, borders, contrast, etc. can be done with the Picture Toolbar (Figure 5), found in both PowerPoint and Word.

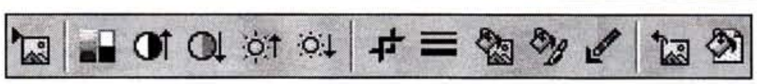

Figure 5. Picture Toolbar that allows users to edit inserted photographs or graphics.

Suggested Software Additions

When using the multimedia functions of Microsoft Office, it may be desirable to combine them with other software applications. Some suggested additions in multimedia software for use in the music classroom fall into two categories: multifunctional notation software and recording and editing software.

Multifunctional notation software will allow many uses for one price. For example, it should be able to produce excellent notation that will allow the user to place every kind of notation into the music. It should also be able to save in various formats including (but not limited to) MIDI and graphics formats (to place into other types of documents). Finale (1987-1999) is well-known notation software that allows the user save and format in many ways. New improvements have made it easier to use and have added functionality as well.

Sequencing and editing software should be multifunctional as well. Sequencing software will allow music to be entered via a MIDI controller (usually a piano keyboard) and edited in various ways. This type of software can aid students in the creative process or allow for creation of practice performance tracks for everyday use. Cakewalk Home Studio (1991-1999) is an example of sequencing software that is multifunctional and relatively easy to learn and use. It allows the user to view and edit entered data in various ways (notation, piano roll, by track). In addition, it provides ways to edit single notes, groups of notes, single tracks, or groups of tracks.

Editing software allows for editing of existing sounds (for example from a CD or other sound source). In some cases, existing video can be edited as well. This type of software can filter and change sound to make it clearer to the listener. An example of editing software is Cool Edit 2000 (Johnston, 2000), which can extract and edit sounds from various sources. The user can edit sounds by changing the ambiance (room), filtering out background noises, editing bumps in tracks, cutting and pasting, fading in and out, amplifying sounds, and so on. It can be an extremely useful tool when editing recordings of groups, or when creating recordings for others.

A Call for Technology in the Classroom

As school districts update and evolve, technology most likely will continue to be an integral part of education. New technology will bring new challenges. As student learning should never cease, neither should educators' learning stop. Technology can be a friend and ally in the classroom; and more importantly, it can aid in maintaining student interest in subject matter.

Music lends itself easily to the use of technology. With the many differing and ever-changing possibilities for its incorporation into the classroom, music educators should be at the forefront of its use and on the cutting edge of finding creative uses for new and existing hardware and software.

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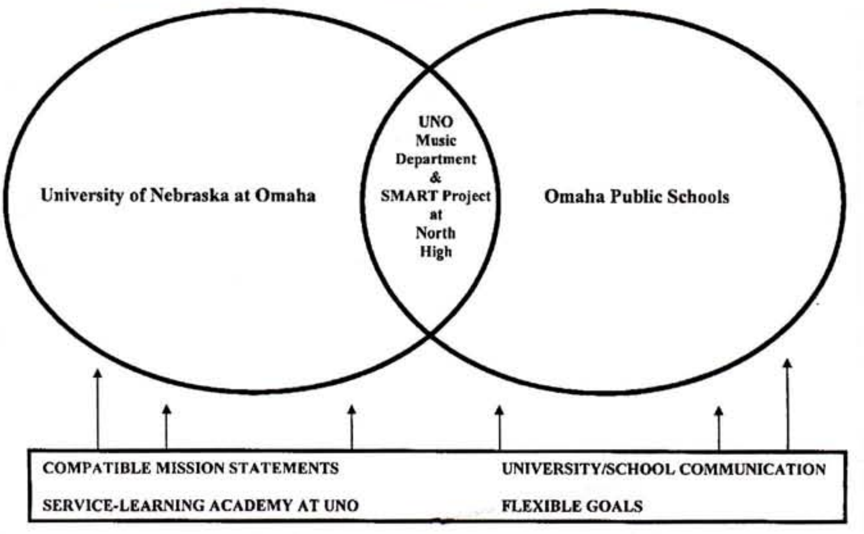
Service-learning & Music Technology: Connecting College Classrooms with the Community

Melissa Berke and Kenton Bales
University of Nebraska at Omaha
Margaret Pavlik and Therese Laux
Omaha North High School

This presentation outlined the role of service-learning and the ways technology can assist with music education service-learning projects. Researchers discussed a partnership that exists between the University of Nebraska at Omaha (UNO) and North High School of Omaha Public Schools. Additionally, researchers shared plans for a new low-cost lab and applications of music technology for several other service-learning opportunities (see Figure below)



In the past 10 years, there has been an increase in college classroom activities that allows students to see a connection between the academic content and its application to real-life settings (Gray et al, 2000). Many individuals in higher education feel that linking learning to settings outside the classroom walls is crucial to the development of students as responsible citizens. Activities that integrate community service with academic study are known as *service-learning*. Service-learning projects are designed in partnership with community organizations to meet the genuine needs in the community while advancing student understanding of course content. In the community setting, students work as volunteers; on campus, they reflect on their service experience, considering its relationship to their course objectives as well as the impact of the service on personal values and professional goals.

Service-learning projects can occur at all educational levels. The focus of this project is middle school, high school, and collegiate students. Because the needs of the community determine the types of collaborative opportunities that can be developed, it is important to provide some background information about the community on which this project was based.

Omaha, Nebraska is a metropolitan are with a population of 700,000. The largest and most diverse school district in the state is the Omaha Public Schools (OPS), which serves 45,199 students in seven high schools, 16 middle schools, and 60 elementary schools. One of the educational aims of the district are community partnerships that link students internally and externally with entities in the community such as families, students, staff, businesses, as well as the general public.

North High School serves as the district's mathematics and technology magnet. It also is an inner-city school that was the recipient of a 21st century community learning center grant from the U.S. Department of Education. This grant provides financial support to rural and inner-city communities for after school centers that provide academic, cultural, and recreational opportunities for the community members. A portion of the funds from this grant was used to develop a music technology lab.

The University of Nebraska at Omaha is part of the state university system. There are approximately 12,000 undergraduate students and 2,500 graduate students that attend each year. Because the institution serves as the state's metropolitan university, one of institutional missions is to seek opportunities to engage with the community. The University is very committed to service-learning and supports collaborative endeavors through its service-learning academy.

With community involvement as a common goal, the University Music Department and the North High Music Technology Laboratory were poised to develop some service-learning projects. The first project involved a graduate course in music technology at North High School taught by UNO faculty. The University also provided a student intern who worked with high school students on various music technology applications as well as provided technical support for the workstations.

While these initial projects were considered successful, the researchers identified two factors that hindered the service-learning connections from being fully realized. The first challenge was the type of technology available within the music department. Additionally, the service-learning components for coursework were not fully complete. To alleviate the equipment problems, researchers proposed a cost-effective, high-tech lab that was partially funded by the University of Nebraska Foundation.

With more compatible equipment available, additional service-learning opportunities have been planned for music education coursework as well as music courses for non-music majors, specifically elementary education majors. Below is a summary of projects planned for each level.

In elementary methods courses for music majors, live-link observations will be possible. This use of technology will allow music education majors to observe elementary music classes in a less obtrusive manner. Digitally recorded lessons will allow students to view a lesson or event multiple times. In a middle school methods course for music education majors, students will serve as mentors to middle school students in an electronic "Composer-In-Residence" project. The college students will be supervised by a faculty composer. The goal will be to have student works submitted for the MTNA composition contest.

Like the elementary methods class, the lab will allow elementary education majors who are enrolled in Music Fundamentals for Elementary Teachers to observe music teaching. Because many of the students enrolled in the course have no previous music experience, the lab will provide several music fundamentals programs that will help students who need additional drill. It is planned that music education majors could help these students as an additional service-learning experience.

Service-learning is becoming an important part of college coursework on many university campuses. As college educators, it is important to give students opportunities to build teaching skills prior to their student teaching experience. Technology can help facilitate both of these needs in very creative ways.

On-Line Resources for Service-Learning

American Association of Higher Education	http://www.aahe.org/
Campus Outreach Opportunity League	http://www.COOL2SERVE.org
Campus Compact	http://www.compact.org
National Service-Learning Clearinghouse	http://www.servicelearning.org/
Service-Learning	http://csf.colorado.edu/sl/

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Using the Web to Learn about Multicultural Music: From College Students to K-8 Students

Cecilia Wang, University of Kentucky

This project was an attempt to integrate technology within the context of a college General Music Methods course. Apart from using computer notation software to present students' individual original compositions, students worked in groups of four or five on a Web multicultural lesson project. This three-week Webproject also provided students skills in writing lesson plans according to given learning standards. Furthermore, the Web lessons created by the students were shared with school music teachers who in turn provided feedback regarding the Web lessons. Teachers also were encouraged to field test these lessons with their school children. It was hoped that such partnerships would benefit everyone and promote more communication among music educators and students of all levels. The specific goals are listed below.

For college students:

- To use technology in Methods class
- To introduce music of different cultures
- To create study guides

For school teachers:

- To provide information about multicultural music resources
- To communicate as partners in music education

For school children:

- To access lessons on music of different cultures on the WWW

For the college professor:

- To obtain feedback from the school teachers
- To obtain feedback from college students and school students

Method

Students in the General Music Methods class (Fall 2000 semester, $N = 29$) were assigned a group project with the following objectives.

- To gain experience working in a collaborative environment
- To gain knowledge and understanding in music of different world cultures
- To find references and teaching materials in the Internet
- To develop skills in using technology with music education
- To implement music standards via lesson planning
- To get acquainted with assessment of music learning

Students were given the following tasks:

1. Production of computer notation of each member's Orff composition using notation software
2. Production of a Webpage on one nonwestern music culture
3. Teaching of a music lesson on the chosen nonwestern music, using a lesson plan and specific listening guide developed by the team
4. Presentation of the Webpage and an accompanying study aid for the Web unit
5. Writing a reflection statement about the project

To aid the students, the instructor provided the following information:

- Project guidelines
- Web assignment
- Sample Web lesson /study guide sheet for school children and outs and resource lists

In the spring semester, the instructor invited school music teachers to view the Web project and evaluate the usefulness of its format and content for their students to learn about music of different cultures. They were given guidelines to provide specific feedbacks. Responses were sent by means of e-mail to the college professor.

Results

The college students completed their assigned tasks as given. Six Web lessons were created by students in groups of 4 or 5 over three weeks. Students did their research in the library as well as through the World Wide Web. All the Webpages contained at least one picture and five links to other resources. The Webpages were designed in color and two included audio. These pages of music from different cultures can be viewed at the following sites.

- Australia [http://www.uky.edu/~cecilia/MUSIC/Australia]
- Brazil [http://www.uky.edu/~cecilia/MUSIC/Brazil]
- Caribbean [http://www.uky.edu/~cecilia/MUSIC/Caribbean]
- Egypt [http://www.uky.edu/~cecilia/MUSIC/Egypt]
- Hawaii [http://www.uky.edu/~cecilia/MUSIC/Hawaii]
- Native Americans [http://www.uky.edu/~cecilia/MUSIC/NativeAm]

Music teachers provided the following feedback:

Positive features:

- Easy navigation
- Attractive pictures
- Links to other resources
- Inclusion of other arts
- Good organization
- Overall quality
- Start with audio
- Built-in study guide

Negative features:

- Reading level of text is too high
- Commercials

Adaptability:

- Suitable for 5th grade or higher as is
- Adaptable for lower grades

Suggestions:

- Keep the pictures
- Maximize attractiveness
- Make it simple
- Show text in small chunks
- Use consistent, "kid-friendly" language
- Proofread the text
- Use more sound, audio, authentic music!
- Present cultures to align with core content required by the state (West African, Appalachian, Jazz)
- Provide captions for pictures
- Provide system requirements for audio clips

Both college students and school children expressed having good learning experiences from the project. Teachers were happy to have additional resources to use for instruction. School children enjoyed learning from the Web. It was concluded that Web sites created by college students can be applicable for use by school children and that it is beneficial to integrate technology, multicultural music learning, and partnerships with teachers and students. The teachers' comments provide important suggestions for improvement on future college technology projects.

(This presentation is available at: http://www.uky.edu/~cecilia/nsmit)

The Art of Inaccuracy

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Music educators continue to discover how MIDI can be used to teach students to be more creative. The elements of the creative musical process are being redefined because of the role of computers in composition. Furthermore, the elements of the creative process are being redefined from a postmodern perspective. Borgo (1999) explained how chaos theory helps explain the complexity of music at a micro level. Borgo suggested that the performance gesture is an integral part of the creative process. The quantitative potential of the computer is essential in standard composition. However, creative musical gestures are achieved through aural preference as opposed to quantifiable decisions. Music educators can help students achieve artful inaccuracy by making them aware of the role of inaccuracy in music and showing them how artful inaccuracy can be achieved in a MIDI file.

Students have the opportunity to play at least four roles in a Musical Instrument Digital Interface (MIDI) class (i.e., composer, performer, sound engineer, and computer technician). The potential for MIDI to serve as a tool in composition has been readily recognized: "A sequencer can be thought of as a box of musical 'crayons' for the music student" (Rudolph, 1996, p. 130). However, teachers and students often fail to realize the potential of MIDI performance (i.e., creative gesture at the micro level).

Muro (1993) referred to the manipulation of MIDI data as the "art of sequencing." These manipulations could also be referred to as the "art of inaccuracy." The computer was developed on the premise that mathematical logic could be used to perform mechanical operations (Hodges, 2001). The computer tools that contemporary composers use via the computer are based on the ability of the computer to count accurately. However, accurate counting does not equal artistic performance. For example, an experienced sequencer technician rarely quantizes at 100%. Currently, the human element is unique in determining what sounds best at any particular moment in a sequence.

MIDI production also can be considered an art of inaccuracy because MIDI replicates a complex phenomenon. Borgo (1999) offered a new perspective on the complex interaction of the human element in music. Borgo explained chaos theory, and then applied chaos discoveries to various elements in music. He stated that many phenomena only could be explained with chaos theory. For example, weather patterns cannot be understood using linear logic. As computers developed within the twentieth century, eventually meteorologists became more successful at tracking complex weather patterns.

Borgo (1999) suggested that music also is a complex phenomenon that cannot be explained with linear logic. For example, one might assume that all variables of performance are controlled in a composition. However, two accurate performances of a string quartet will show differences in gesture interpretation at a micro level. Borgo acknowledged that these differences are exaggerated in improvisation. Hence, a continuum of free interpretation exists from the most controlled musical experience to the least controlled musical experience.

Because of a greater understanding of gesture in the creative process, performance now may be reevaluated as creative property in a finished work. Historically, performance subtleties have been recognized as recreative gestures but not always recognized as original musical thought. Within folk genres (e.g., blues), the performance gesture may be as important as the actual note played in the creative process. Borgo (1998) explained that recording possibilities have redefined "literate" and "non-literate" musical creation. Because sound can now be edited, previous distinctions between the process of creation in oral and non-oral traditions no longer exist. If only MIDI data or sound clips are manipulated in the future of music composition, the performance gesture might become an essential part of the creative process. Limited notational representation of such gestures may hold nominal significance. However, current copyright laws perpetuate continued reliance on a limited categorization of creative musical thought. For more information, Baskerville (2001) offers an excellent review of copyright law in the context of technological production.

Recognizing the presence of creative gestures in music is only a first step in the process toward replication of such gestures. The MIDI teacher must also consider how artful manipulation of MIDI data can be achieved. Artificial intelligence might offer insight into how creative gestures occur. The computer's replication of human gestures could give teachers quantifiable tools in teaching creative gestures. Bresin and Friberg (2000) compared the effect of computer replications of human musical gestures categorized as seven separate emotions. The researchers found a significant relationship between intended emotion and perceived emotion. One avenue for teaching the creative gesture to students might be to encourage students to copy the gestures the computer used to produce various emotions. However, the study did not offer data to help students replicate subtle human artistic gestures. Bresin and Friberg examined emotional differences at a macro level (i.e., the formula for anger was applied to the entire piece). The test failed to recognize the subtle differences that can occur in human performance from one time frame to the next time frame.

Rychlak (1999) stated that current artificial intelligence is unable to replicate actual human thought. According to Rychlak, computers always choose the next action based on logic. In reality, choices are made about the next thought or action based on choice. The choice may not be the most logical mathematical choice. The capacity to make illogical choices may separate human sequencing from sequencing based on artificial intelligence. The ability to choose a particular musical gesture because it "sounds right" is why human music creation is an "art of inaccuracy."

Currently, complete understanding of how creative gestures occur is in a relatively early stage. However, MIDI teachers can make steps toward developing creative gestures in students by using available information. Teachers can enter a three-step process toward enabling artful sequencing in students. The first step in the process is recognizing the unique potential of individual students. For some time music therapists have recognized improvisation as a means toward understanding their patients. Often music educators are guilty of prescribing creative remedy for the student without truly understanding the student's personality. As research progresses, one day teachers may be able to decipher a great deal regarding the personalities of students by analyzing their creative gestures. Even if this type of analysis never progresses toward exact science, teachers at least can become more aware of student potential at the creative gesture level.

Next, the teacher can make students aware of their creative potential. Students can be made aware of the power of data manipulation through teacher demonstration. Gaber (personal communication, 1999) showed how various types of artful inaccuracy could be achieved within a short section of music.

Finally, students are encouraged to experiment with the "art of inaccuracy." They are encouraged to take chances in their pursuit of what sounds right. Integrity is maintained at this level of experimentation by encouraging students to play their MIDI files for other students or the teacher.

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Teaching Student Composers to Use a Desktop Audio Workstation and Digidesign Pro Tools

John Jinright and Randal Boone
Troy State University

In this presentation, a university instructor (Jinright) described how he set up a digital audio workstation at minimal cost for use by his music students. One of the music students (Boone) demonstrated how to use the tools and played examples of student compositions.

The workstation consists of a Digi100 USB digital mixer, an amplifier, two Alesis monitors and a Windows based computer. Microphones were fed through a compressor before sound was mixed. An inexpensive battery powered alarm from Radio Shack was installed for security reasons. The software programs Acid and Pro Tools were used to capture and edit the sound. The software and equipment allowed students to freely compose, record, master, remix, and synchronize music with video.

Survey of Music Education Technology at Colleges in the Southeastern USA.

Harry E. Price and Kok Chang Pan, University of Alabama

The purpose of this study was to collect data concerning the implementation of technology in Southeastern United States music education programs at the college level in NASM accredited music education degree programs. Participants (N = 69) from the southeast completed a questionnaire, providing curriculum, facilities, and personnel data regarding music education technology. The results showed that not all of the colleges surveyed have adequate staff and facilities to provide music education technology courses to their students. The principal concerns expressed were resources, trained instructional personnel, and a dearth of research on the effectiveness of music education technology. The study also discussed issues faced by music faculty in implementing music education technology.

Note. See the *Journal of Technology in Music Learning, 1*(2), pp. 56-66, for Price and Pan's peer-reviewed complete article.

Insights and Strategies for Developing a Music Technology Program

Margaret Pavlik and Therese Laux
North High School, Omaha, NE

Do you have a dream of having a music technology program? Do you want to make it a reality? This presentation illustrated how a large metropolitan high school turned this dream into a reality through a federally funded "21st Century Community Learning Center" grant. We also described how Omaha North High School's music technology center serves the needs of students during and beyond the school day. We explained how Omaha North developed a music technology program, beginning with physical setup to integrating technology into the music curriculum as well as other disciplines.

The presenters provided an information packet for participants that included a description of North High School's Music Technology Center with a list of hardware and software, a resource list of vendors and industry contacts, information on applying for a "21st Century Community Learning Center" grant, a variety of sample lesson plans for music technology at the secondary level, and a list of related Web sites.

An outline of the presentation follows.

1. *An overview of technology in music education*
   - Technology in our world: Technology as a resource and tool
   - Students and technology: Active learning
   - What music technology can do for your students
2. *Funding sources for technology*
   - United States Department of Education: 21st Century Community Learning Center
   - Other sources of funding
   - Managing projects and funds
3. *Computer Systems and Lab Management*
   - Physical setup: space, furniture, and wiring
   - Suggested hardware and software
   - Lab management and security
4. *Teacher Strategies and Student Activities*
   - National Standards
   - Music Technology competencies
5. *Resources for Educators*
   - Technology Institute for Music Educators
   - Organizations
   - Web sites
6. *Showcase of Student Work and Activities*

Integrating Web based Learning and Instruction into a Graduate Music Education Research Course: An Exploratory Study

Nancy H. Barry, University of Oklahoma

Abstract

The purpose of this study was to develop and evaluate Web based components for a graduate music education research course. The first phase of the study began with development of two types of Web based materials for a music education research seminar. On the basis of student outcomes, student comments, and a generalized impression of the course, this instructor believes that the Web based components of this course were successful with higher student test scores resulting from Web based portions of the course in comparison with the more traditional instructional units. The second phase of the study was carried out with twelve graduate music education students enrolled in a similar music education research course at a different university. Student and instructor recommendations from Phase I resulted in certain modifications to the instructional procedures used in Phase II. In order to compensate for the lack of communication during the Web lessons that was cited as a problem during Phase I, e-mail communication with the instructor was emphasized during Phase II. Unlike the first course, in which Web based and on-campus instruction were blocked in relative large units, the calendar for Phase II was designed with Web based and traditional instruction alternating throughout the course. Data from the second phase of the study generally support the findings from Phase I. However, with this larger group of students, greater diversity in the degree of Web use was observed.

Introduction

Web Based Learning and Instruction (WBLI) holds many advantages for learners, particularly adult learners who must balance school with professional and home responsibilities (Brown, 2000; Keating & Hargitai, 1999; O'Leary, 2000). In a study conducted at the University of Central Florida, adult students identified the following benefits of WBLI (Hudson, 2000):

1. Ease of communicating helps students to interact with on-line classmates and to develop even closer relationships than they would with "live" classmates.
2. WBLI courses provide opportunities to search the Web and master computer skills that are essential in today's world.
3. WBLI enables students to communicate with other students and their instructors at any time throughout the day, making it easier to share information and ask questions.

4. The flexibility of WBLI allows adult students to continue to meet family and job responsibilities while pursuing an education.
5. WBLI helps students to develop self-sufficiency and to engage in independent thinking and research.

Reduced costs, accessibility, flexibility, and improved technological capabilities have resulted in an increasing interest in WBLI among higher education institutions and faculty (e.g., Bonk & Dennen, 1999; Brown, 2000; Childers & Berner, 2000; deVerneil & Berge, 2000; White, 2000; Shave, 1998).

Research indicates that both undergraduate and graduate students hold generally favorable attitudes about WBLI (Angulo & Bruce, 1999; El-Tigi, 2000). However, students still have many misgivings about taking a course entirely through the Internet (Angulo & Bruce, 1999).

Implementation of WBLI certainly takes many forms. Shave (1999) described four models of using the Internet for course delivery:

1. *Informational (Level 1).* The Internet provides relevant course information such as syllabi, calendars, and announcements.
2. *Supplementary (Level 2).* Other resources are included in addition to informational materials such as additional references and practice materials. Supplementary materials are not required for the course, but may enhance the learning.
3. *Dependent (Level 3).* Students must use the Internet to access major course components. This level includes additional materials beyond the Informational and Supplementary levels.
4. *Fully On-line (level 4).* The entire course, including materials and activities, is on the Internet.

In a similar vein, Reeves and Dehoney's (1998) ongoing qualitative study of faculty use of the Internet at the University of Georgia identified six functions:

1. course management
2. instructional text
3. instructional graphics
4. Internet resources
5. software
6. communication

Research indicates that WBLI can be as effective as traditional instruction in terms of student test performance (Germain, Jacobson, & Kaczor, 2000; Teeter, 1997). McCollum's (1997) study of a college statistics class indicated significantly higher midterm and final exam scores for students participating in an online version of the course in comparison with students in a traditional classroom version of the course.

Duchastel (1996-97), however, points out that merely using the Web to support a traditional model of university instruction fails to tap into the full potential of WBLI. A six-point model of WBLI is proposed: (a) specify goals, (b) accept diverse outcomes, (c) request knowledge production, (d) evaluate at task level, (e) build learning teams, and (f) encourage global communities.

Exclusive use of WBLI in lieu of traditional instruction may make it difficult to cultivate a "community of scholars." A case study of an online graduate course revealed that students perceived a lack of interactivity between students and their instructor and that the "graduate school experience" was diminished for some participants (Baylen & Tyler, 1998). Similar findings were reported in Donaldson and Thomson's (1999) study of undergraduate college students' communication preferences.

WBLI is a complex process involving a number of interrelated needs, concerns, and expectations on the part of both the learner and the instructor. Because of this complexity, qualitative approaches are recommended for WBLI evaluation (Baylen & Tyler, 1998; Michalski, 2000; Reeves & Dehoney, 1998).

The purpose of this study was to develop and evaluate Web based components for a graduate music education research course. Qualitative methodology was employed in this exploratory, action research project. Using different data sources and/or different data collection techniques in qualitative research helps to insure dependability of results, a process sometimes called *triangulation* (Bogdan & Biklen,1998). Data sources in the present study included student interviews, written student course evaluation narratives, numerical student course evaluations, student tests and products, and my (the instructor/researcher's) field notes and journal entries.

Phase I

The first phase of the study began with development of two types of Web based materials for a music education research seminar: (a) materials to supplement traditional classroom instruction, such as the course syllabus and calendar, links to useful Web sites, and review questions with sample responses; and (b) materials to be used in lieu of traditional on-campus classroom instruction (i.e., "virtual lectures" with links to Java applets and gif images illustrating various course topics, and practice quizzes over each unit of material). This was a small scale exploratory study with relatively modest integration of Web based components within the context of the course. The course calendar consisted of approximately 65% traditional classroom instruction with Web based supplements (students attending classes on campus with access to additional readings and materials on-line) and 35% Web based instruction (students participating in Web based lessons off-campus). Four graduate music education students enrolled in a summer research seminar participated in this phase of the study.

Data sources included my journals and field notes, student products (quizzes and other assignments) and an anonymous course evaluation form which students downloaded from the course Web site and returned in addressed postage paid envelopes that were distributed on the last day of class.

Findings from the first phase of the study indicated that students found the combination of Web based classes with traditional classroom instruction motivating and effective, with all students rating the Web based lessons as "Extremely effective" on the evaluation form. Open-ended items on the evaluation form included:

> What were the greatest strengths of the Web lessons?
> "I could study whenever I want and spend as much time as I want reading and taking notes." "I could learn at my own pace."
>
> What were the greatest weakness of the Web Lessons?
> "Lack of interaction." "Couldn't ask questions."
>
> Please describe any ways that the Web Lessons could be made more effective.
> "Putting only the material that we should know on the Web or having an outline for reading. Sometimes I got too deep into the material, because I couldn't figure out what exactly I was supposed to read."
>
> Do you have any other suggestions or comments regarding the Web Lessons? If so, please elaborate.
> "I don't know if it would work, but I think it would be good to have 40/60 proportion of Web to classroom lessons. On Web we can read about types of research, and other things, and in class could do math and address the questions. It would be good to have the schedule when we switch from the classroom to Web and back every other or couple days."

While they appreciated the convenience of the Web based lessons, the students indicated reservations about taking a course in which 100% of the classes would be Web based. The course calendar was arranged with the block of Web based classes sandwiched between two blocks of traditional on-campus classes. The students and I found this arrangement to be effective. However, some students also suggested alternating Web based and traditional instruction throughout the course and increasing the proportion of Web based lessons. Examination of student test responses and other products indicated high levels of content mastery under both instructional conditions.

Phase II

The second phase of the study was carried out with 12 graduate music education students enrolled in a similar music education research course at a different university. Web based materials developed in the first phase of the study were refined and were incorporated into the second course. Student recommendations and my own reflective journal and field notes from Phase I resulted in certain modifications to the instructional procedures used in Phase II. In order to compensate for the lack of communication during the Web lessons, cited as a problem during Phase I, the emphasis upon e-mail communication was increased. I made a point of e-mailing students frequently and encouraging students to e-mail their questions, comments and concerns to me. Unlike the first course, in which Web based and on-campus instruction were blocked in relatively large units, the calendar for Phase II was designed with Web based and traditional instruction alternating throughout the course.

Data sources included my journals and field notes, student products (quizzes and other assignments) and an anonymous course evaluation form which was completed during the last class meeting, collected by a student monitor and returned to the instructor.

Data from the second phase of the study support the findings from Phase I. Students found the incorporation of Web based course components both useful and motivating. Most students found the increased use of e-mail communication helpful. The only exception was one student who explained "If I had e-mail at home, it would have been [useful] but since I don't it was an extra step to e-mail assignments." As in Phase I, these students expressed generally favorable attitudes toward the Web based components of the course: "It provides a lot of interesting and useful URLs and it saves time. . ." "Yes [the Web site was helpful]. . . . I've never been in a class that tried to do this." "Yes. I can find a lot of information." Nine students reported fairly extensive use of the Web site, exploring links for additional reading and information on course topics. However, with this larger group of students, greater diversity in the degree of Web use was observed with three students indicating that they only used the Web site to meet specific assignments: "I did not use it unless assigned."

Discussion and Conclusions

Results of this study are consistent with El-Tigi's (2000) survey of 142 students, finding that students held generally positive attitudes about their course Web site and that course Web sites were perceived to save time, provide 24-hour accessibility to resources, facilitate course preparation, and provide for increased understanding of class expectations and objectives. These students responded to WBLI in much the same manner as the graduate students in Angulo and Bruce's (1999) study: Despite generally positive attitudes, they held misgivings about taking a completely Web based course.

Both student data and my field notes and journals indicate that WBLI was as effective as traditional classroom approaches. The conclusion that WBLI is appropriate and effective for a graduate music education research course is consistent with the high level of satisfaction reported in Baxter and Miller's (1998) survey of faculty with experience teaching graduate courses via the Internet. Unfortunately, with only a 38% return rate, the generalizability of Baxter and Miller's findings is questionable.

The ongoing process of developing and testing the relatively modest Web based materials described in this paper required many more hours than I had anticipated at the outset of the study. My experience in this study was consistent with other research indicating that developing and maintaining course Web sites is extremely time consuming (Baylen & Tyler, 1998; Teeter, 1997). While WBLI holds much promise as an instructional tool, issues concerning faculty workload and credit continue to present challenges. A report by the Web Policy Committee at the University of Oregon (Bothun, et. al, 1995) pointed out the importance of providing faculty incentives for development of WBLI materials and recommended that administration develop an explicit policy regarding tenure-related credit and/or consideration for merit based pay increases.

It is important to note that this study was conducted with graduate students, learners who generally were highly motivated and had well-developed study skills. It is likely that a modified approach would be required to achieve similar success with less sophisticated learners. For example, a recent study of undergraduate students revealed a lack of motivation to use course Web sites without some specific incentive such as an assignment or course requirement (El-Tigi, 2000). In contrast, Teeter (1997) found that students in an online education course had higher motivation than students in a traditional classroom course.

According to Baylen and Tyler (1998) "The Web can become a static learning environment if interaction is not occurring between the learner, content, instructor, or technology" (p. 10). The WBLI in the present study used informational and supplemental materials and, in some cases, even utilized Web-dependent materials (Shave, 1999). While effective, however, these materials failed to tap into the full potential of WBLI. Students enjoyed having ready access to the instructor via e-mail, but, while some informal student collaboration did occur, communication and collaboration among students was not supported by this course. Future versions of this course should allow for more student communication and collaboration so that a true on-line learning community develops (Dial-Driver & Sesso, 2000; Donaldson & Thomson, 1999; Hudson, 2000).

Results of this study indicate that Web based components can provide a useful supplement to traditional classroom instruction and, in some situations, can serve as a valid substitute for traditional on-campus instruction in graduate music education research courses. This exploratory study was field based and quite small in scope, and cannot be generalized to other situations. More research is needed to explore fully the implications of WBLI for higher education.

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The Creative Music Project: A Pilot Study in Teaching Musical Understanding and Composition In Public Schools

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In the spring of 2001 the Institute for Music Research (IMR) at the University of Texas at San Antonio began a pilot creative music technology project in Northside Independent School District's (ISD) nearby Monroe May Elementary School. This project, which lasted from late January to April, was not experimental in nature; it was designed simply to indicate initial feasibility, to point the way for more focused future studies, and to hint at answers to a few broad questions. The questions were: (a) Can a music technology composition program be implemented in a typical school computer lab using inexpensive, off-the-shelf music hardware and software tools? (b) Can normal students (not just the musically gifted) learn to create "real" or "quality" music effectively using these tools? (c) Can such a program be implemented within the parameters of a standard public school curriculum? (d) What teaching approaches seem most effective at encouraging musical creativity using technology?

Northside ISD and May's faculty supported the project generously. Over the eight-week period the IMR was given access to May's 25-station computer lab every day and to each of the four fifth-grade classes, nearly 100 students total, once per week, Monday through Thursday. The laboratory computers were Pentium 133 MHz machines with 32 MB RAM and 2 GB hard drives. A grant from Texaco Corporation allowed us to install better quality LabTec LT 835 Headphones, Creative's SoundBlaster Live Audio Cards, and Cakewalk Express sequencing software on each machine. Cakewalk Express is a fine basic MIDI sequencing program that is included free with each SoundBlaster Live card. The cost of all these items was only $120 per machine. That is amazingly inexpensive compared to similar quality music hardware and software of just a few years ago. The IMR also purchased 25 of Creative's new BlasterKey Keyboards at approximately $89 each—also amazingly inexpensive. These keyboards are sturdy and designed specifically to work with SoundBlaster Live cards. Unfortunately time and space limitations in the lab did not allow us to use them.

The time limitations imposed before the project began—eight meetings of less than 30 min each—meant that we would have either to superficially cover the many aspects of music creation or delve more deeply into one element. We chose the latter course, opting to emphasize the element of form and touching on other elements like rhythm, texture, and harmony only when necessary to explain structural qualities of the music we used. The element of melody was emphasized, also, but only because it demonstrated easily recognizable structural features.

We also chose to limit musical examples to the popular idiom. This musical genre is not only more accessible to a majority of fifth-grade students, it almost always clearly demonstrates the structural concepts we wanted to teach. We did have to be quite careful to select music with acceptable lyrics and subjects.

We planned from the beginning to show a tangible product from each student at the end of every session. That product would be a short musical composition demonstrating the student's grasp of that day's musical concepts in an original manner. (Composition in this case means a MIDI sequence, not notation.) Each composition would be displayed on a dedicated project Web site and would serve as both a demonstration of competence and a motivational factor for the student.

We prepared oral presentations and many illustrated handouts for each session's concepts. The handouts were to act as "how-to" reference material as students manipulated the concepts on the computers. However, we soon found that a more expedient way of really connecting concepts with student product was to preset each station's sequencing program before a session with a template.[1] These templates—actually just prepared partial songs and pre-selected sets of tools—made it easier for students to focus on individual concepts and work within the boundaries of typical musical structures as detailed below. We did not feel that their use restricted creative freedom but rather, as Stravinsky stated in his Harvard Lectures, that boundaries are *required* for creativity.

Each session followed a schedule similar to the following model.

1. Instructor arrives and presets 25 machines:	15 min
2. Students arrive and instructor presents concepts:	10 min
3. Students work on computers and instructor writes observations:	15 min
4. Students save work and then gather to hear samples of previous week's output:	5 min
5. Students leave and instructor resets machines:	5 min

In addition to the daily schedule above, we followed a weekly schedule of preparing handouts and other multimedia materials. At the end of each week we collected, analyzed, and formatted each composition for the Web. We also gathered and organized our written observations at week's end.

The musical concepts we wanted to relay to the students over the course of the eight weeks primarily were structural; that is, they related to how typical popular music is laid out. Below is a partial list of the concepts we presented:

- To make music, just organize time with sound.
- Repetition of recognizable sounds or sound patterns helps us organize time.
- Sounds and sound groups always happen over evenly spaced instants of time.
- In music, instants of time (beats) are usually grouped in 4s.
- The groups themselves (and groups of groups) are usually grouped in 4s
- In popular music the beat happens between 100 and 138 times per min.
- We can make music more "rock-like" by emphasizing beats 2 and 4.
- Patterns can be made more recognizable by avoiding long sounds.
- Music often is constructed in layers (drums, bass, harmony parts, lead line)
- Melodies are monophonic and show shape.
- Melodies contain repeating rhythms and up-down patterns.
- Melodies follow the beat and meter of the music.
- Repetition of recognizable melodies helps organize a whole piece of music.
- Short songs typically use a three-part format for repetition (ABA)
- A common format for repetition in longer songs is Rondo (ABACA and its variants).
- All musical rules can be bent or broken but only a few at a time.

What the CMP Pilot Taught Us

This project was not an experiment; that is we did not attempt to collect statistical data or compare treatment to nontreatment student populations. However, we did make deductions based on our written observations. They will be used to guide us in focusing similar studies in the future. Here are just a few of the lessons we learned from those observations:

1. Do not install unneeded software. In addition to purchasing keyboards that time constraints did not allow us to use, we installed the full, default set of software that came with the SoundBlaster Live cards. Only near the end of the project as other teachers began to report sporadic freezing and crashing problems did we realize that this default set included nearly 350 MB of software that had nearly filled the remaining space on the hard drive. We could have eliminated about 300 MB of software with no loss to the project.

2. Written materials should be simplified or eliminated. Students did not have time or inclination to review several pages of text directions as they worked the computers. Although we soon reduced the number of pages we gave to students at each session, even this may have been too much. Templates helped with efficiency, but in the future we will try other approaches—perhaps we will incorporate mediated directions into the program itself.
3. Use a simpler music creation tool. The sequencer we used in this project, Cakewalk Express, was included free with the SoundBlaster card and was a high quality, versatile piece of software. However, we began to notice early in the project that the majority of our teaching time was being devoted to teaching children how to use the tool and not how to create music. Cakewalk does allow the user to hide unnecessary interface devices, and we used this feature. However, in the future we may want to use a simpler tool with more intuitive controls.

We made many more observations than can be included in this article. A full report, including materials, images and music files, can be found on the project Web site at http://music.utsa.edu/cmp.

Overall, at the IMR we feel that the Creative Music Project was successful in its mission of pointing the way for similar studies. The observations we made obviously will help us avoid pitfalls and be more efficient in the future. It also helped us develop some tentative answers to our initial questions. It certainly seems feasible to set up a creative music making environment without the huge monetary investment required only a few years ago. Deducing from teacher reports, the students seemed to enjoy this new type of music making. Furthermore, their music products seems to indicate that any child can create original music that follows commonly accepted structural guidelines of composition, and that they can do so within the parameters of a normal public school curriculum. As to the quality of their output, future studies will give us the opportunity to investigate this factor in a more detailed manner. We might also find that quality of output is purely a subjective judgment and not as important to a child's musical education as the creative experience itself.

[1] What a surprise! We found that most children would rather manipulate the computer program than listen to a university professor lecture on musical concepts or read his carefully crafted directions on paper.

Using Sibelius® Notation Software to Teach Music in Schools

Larry Marchese, Sibelius USA

When one first thinks of what to do with notation software, composing and arranging music usually comes to mind. Indeed, that is the primary task for notation software; however, the purpose of this paper was to demonstrate how Sibelius® can be an effective tool for the music educator in the classroom. This presentation showed how Sibelius is very effective for the student. The presenter first discussed why notation software is an excellent tool in the classroom. Next, there was consideration of how Sibelius' attributes make it especially effective at this task. Finally, the presenter showed how Internet technology could be used by the music teacher and students.

Notation software provides an easy way to show music examples on a computer screen. If an LCD projector is available, the music examples can be projected to a large screen in the classroom. If a computer lab is available, the music examples can be placed on student computers.

Music is interactive, meaning it can be viewed, played, and heard. This is the big advantage of notation software and fits music education perfectly. What better way to teach than allow students to hear what they are studying, writing, or analyzing? Notation software is an effective tool for creating tests/exams, worksheets, flash cards, and so forth. MIDI files can be translated into music examples. Existing music can be scanned and made interactive. Music can be placed on the Internet.

How Does Sibelius Notation Software Help Teachers Teach Music in the Classroom?

It is easy to learn. Why? Sibelius does not use a tool or modal system for editing, note entry, copying, etc. (you do not have to select a specific tool or mode). To edit, you simply click and move anything on the screen at any time. You copy and paste notation like a word processor, and you may enter music any way you like—and at any time.

Music can be entered using alphabetic input. Type A-G for pitches. In addition (in Version 2), use the number keys (2 through 8) to create an instant interval Use the arrow up and down keys to shift octaves up and down, or to move diatonically up and down.

Keyboard shortcuts are easy to learn and remember: T = time signature, K = key signature, S = slur, P = play, etc.

The keypad on the screen is shaped and organized like the number pad on a computer keyboard. Pressing keys on the number pad corresponds to the graphical keypad on the screen. Therefore, you do not have to learn a number system or need a template.

Sibelius is organized in a very logical, intuitive way. Since it was designed and written by musicians, for musicians, students and teachers alike usually can learn Sibelius very quickly. Because of this important fact, classroom time does not have to be wasted learning a music tool. Obviously, classroom time should be focused entirely on music.

Sibelius allows you to create music examples fast and efficiently. Music can be input with a mouse, with the computer keyboard, and using a MIDI device. With MIDI, music can be step input (one note at a time), or via live playing. Our live entry system, Flexitime, is designed to input what you *meant* to play. It tracks your tempo changes (intended or not), inserts articulations (staccato, tenuto), and makes live entry one of the fastest ways to enter music.

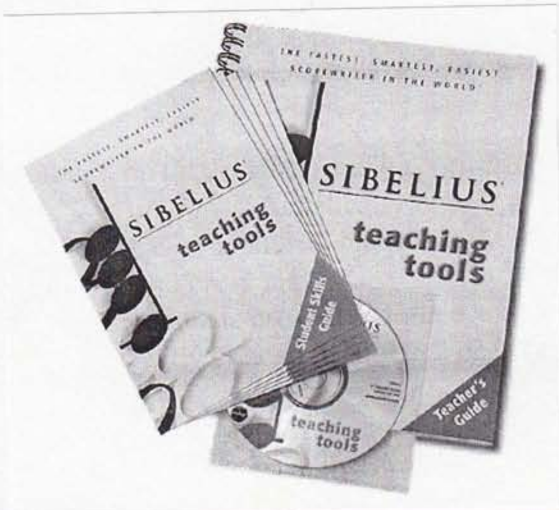
Music scanning technology has come along way and often surprises people when they see what it can do. It has become a great way to enter music examples for analysis, teaching theory, etc. If it is printed music on paper, you can scan it into Sibelius. Sibelius comes with a free copy of Photoscore Lite,which has limited features, but is effective for smaller projects. Photoscore Pro is a full featured product that scans more marks, triplets, and even text.

MIDI files (often found on the Internet) can be converted instantly into music notation. Sibelius will save you time by automatically ordering the instruments, inserting the necessary clefs, brackets, braces, signatures, tempo marks, etc. All playback settings are automatic as well. Just open and press play.

If you or your friends have music created in Finale®, Sibelius can read those files as well. Since most music is currently created in Sibelius or Finale, you can open and use just about any notation file available.

Sibelius provides realistic playback. Any time you add articulations, dynamics, tempo text, etc., Sibelius plays the music back that way. Students can hear the impact of changes to the music. Computers typically play back music very mechanically, however, Sibelius offers a variety of features to make the music play much more musical. If you add a variety of marks to the music and wish to save it as a MIDI file, Sibelius turns all marks into MIDI information you'll hear if the file is played apart from Sibelius.

Teaching Tools is a classroom resource featuring a 200-page teacher guide, 20 student skills booklets, and CD-ROM containing all the files. It is a curriculum that describes how Sibelius is to be used in the classroom. Each exercise contains an overview, objectives, and assessment, as well as required skills and preparation, "How to do this with Sibelius," and extensions. (The question marks on the graphic represent links from our Web site describing each part of the material. The top pages are teacher completed worksheets and student worksheets. The next pages show the curriculum/ exercise steps as mentioned above. The third booklet at the bottom is the student skills guide.)


THE FASTEST, SMARTEST, EASIEST SCOREWRITER IN THE WORLD
SIBELIUS
teaching tools
Student Skills Guide
Teacher's Guide


C4 Repetition
C4 Repetition
6. Creating instruments

MENC standards are met without you having to do anything extra. While you are teaching music, computer skills are learned as well. Often this occurs without you realizing it. We have specifically designed Teaching Tools so that using computers in the music classroom is as easy and transparent as possible. All steps are given and presented in an organized manner. The focus is entirely on teaching and learning music, not on the computer. Sibelius and Teaching Tools are simply tools for the music educator and should never be the focus in the classroom. The focus is music.

The Internet for Music Educators

In 1998, Sibelius introduced a new technology called Scorch® that made it possible for users to save anything created in Sibelius as a Web ready page. It was simply a save-as function and no additional work was required, making the task extremely easy, compared to the typical work required to get something Internet ready. The music can be displayed and played back on a Web browser, and even can be transposed. With the introduction of the latest version of Scorch (which enables printing and the ability to save), the applications for the classroom are even greater.

One classic example of using Internet technology can be found on our Web site at http://www.sibelius.com/education/scales/. There you will find Scorch® pages containing scales that can be read, played, downloaded and printed. They have been written in the treble and bass clefs, to be played on any instrument The pages also include:

- Major scales in all keys
- Major arpeggios in all keys
- Minor scales in all keys (harmonic & melodic)
- Minor arpeggios in all keys
- Chromatic: can be transposed to start on any note
- Modes: can be transposed to any key
- Dominant seventh arpeggios in all keys
- Diminished seventh arpeggios in all 3 diminished chords

Students can listen to the scales, practice with them, print them out, and so forth. They are available 24 hrs a day, 7 days a week.

Here are some additional Internet applications:

The Vermont MIDI Project (http://www.vtmidi.org/), a network of over 60 schools across Vermont, is an online music mentoring project where students in grades 1 through12 submit their music compositions for sharing and critique by professional composers, teachers and other students. The MIDI Project works with professional composers who give feedback to student compositions online. Some composers are available as artists-in-residence. Other composer/mentors also are music educators in schools, working with students on composition, as well as classroom music, or with instrumental and choral performing groups.

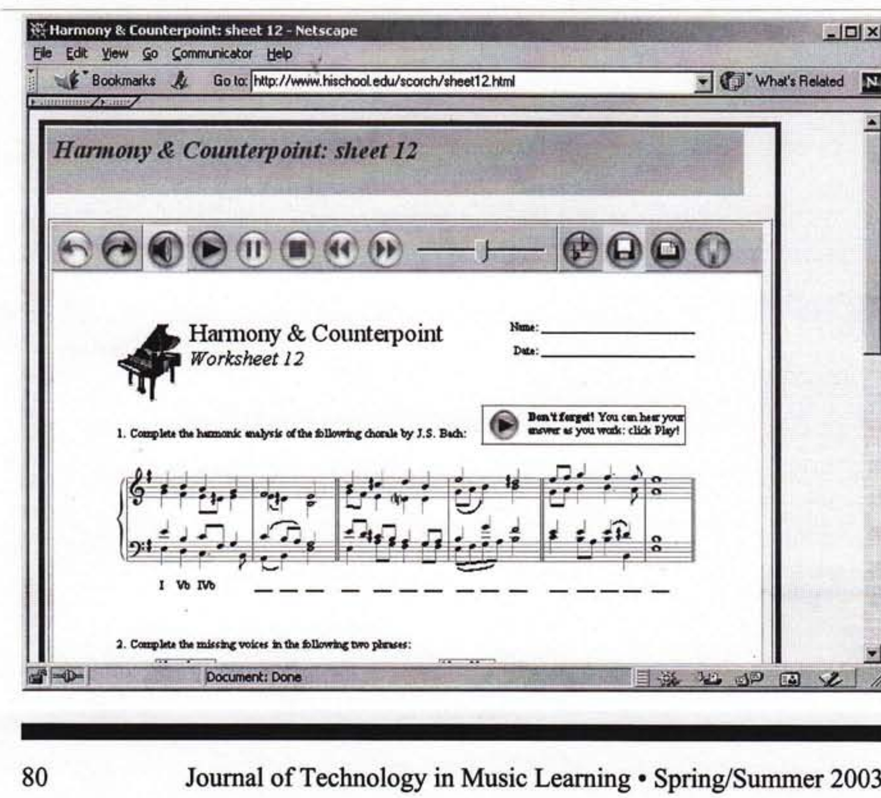
Log on to their site for additional information and read about how successful this project has become in teaching composing to students—and how much fun the students are having in learning to compose music.

An application similar to the above scenario would involve students placing compositions on the school Web site for their friends and parents to see and hear. Since friends and parents may not read music, on the Web, they can listen to it. This is highly motivational to kids, and is impressive to parents (and the school board).

Teachers could create practice worksheets that are either generic scales like the example above, or are more specifically related to region or state tryouts; for example, all-region and all-state sight reading examples, warm ups, and so forth.

What about practicing choral parts at home? In this case, you could either e-mail Scorch files to students, or place them on the school Web site. You could send them (or post) the following: just their part (so they can listen and learn their part), all the parts minus their part (so they can practice their part while listening to the others, or all the parts (so they can hear what it's supposed to sound like (harmonically).

Here is what a "Scorch" file looks like on the Internet:



On the toolbar you may choose to turn pages, choose which sound device to use for playback, use the transport/playback controls and tempo slider, click play button to play from the start, or click on the score to play from that point, or stop. You may also change key, save the score to disk, print, and obtain Scorch information and updates. Use Page Up and Page Down and the up and down arrow keys to scroll up and down the score.

I trust this paper has been helpful to you as you consider the advantages of notation software in the music classroom. We have looked at a variety of music applications and seen how Sibelius, Teaching Tools, and Scorch are powerful tools for teachers and students. Thank you for considering our products.

"Yes, But Does It Help"? A Preliminary Report on a Web Enhanced Large Lecture Music Appreciation Course

Dorothy Keyser and Katherine Norman
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This presentation was a preliminary report of an ongoing investigation of the effectiveness of Web enhanced interactive supplements to two sections of a music appreciation course taught in a large lecture format (N = 250). These supplements were delivered via Blackboard, a Web based course management system developed by Blackboard Incorporated (http://www.blackboard.com).

Blackboard creates a course site framework with sections for announcements, course information (syllabus, instructor information, etc.) and course documents (handouts, assignments, etc.). In addition, the program has a built-in feature that makes it possible to create online tests and surveys that can be automatically graded and the results recorded in an online grade book. The software also incorporates several communication tools including a threaded discussion list and a real-time chat program.

For the purposes of this investigation we concentrated on the following capabilities of the system:

1. Posting Grades

2. Dissemination of Information
- time sensitive announcements
- assignments
- course documents
- other course information
- instructor contact information
- course calendar

3. Communication

- e-mail to instructor and graduate teaching assistant
- submission and response to assignments via the "digital drop box"
- threaded discussion list
- virtual office hours via the "virtual classroom"

The presentation had two parts: (a) documentation of how these system capabilities were integrated into the course, and (b) a report of instructor and student perceptions about their utility. The process of data collection involved (a) student surveys at the beginning and end of the course, (b) mid-semester small group focused interviews according to the Small Group Instructional Diagnosis model (SGID), and (c) instructor interviews.

It is clear that students are receptive to Web based supplements to regular instruction, but it is also clear that there are several problematic issues related to their implementation, their continued maintenance, and their use by students. At this point, our results are preliminary rather than definitive. Nevertheless, our current findings should be of interest to others who are considering Web based enhancements to regular classroom instruction, in particular, to those working in a large lecture class format. In addition, the SGID model might be of interest to other researchers who are working with large groups.

Digital Video Editing – It's So Easy!

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Recent advancements in digital technology has made computer based high quality video editing not only possible but also affordable. Conventional video editing has been a tedious and expensive process, requiring multiple video recorders. Often the results are disappointing. With the current digital technology, one can easily edit and add titles and effects with quality that was once possible only with professional equipment.

This paper discusses the basics of digital video editing and its merits, what is necessary to get started, and some suggested applications.

What is Digital Video?

In a broad sense the term *digital video* refers to any video material that is represented in digital format. Traditionally, video images were created, stored, transmitted and viewed using *analog* technology (standard analog video format is called the *NTSC* in the US—the format used in regular TV broadcasting and VHS tape.) That is, the content of the video material (and accompanying sound) is represented using the varying intensity of electrical voltage and current—the brighter the image, the higher the voltage, for example. Digital video uses numbers to represent such information, and the numbers are represented by a series of electronic pulses that can be transmitted, processed and stored using computer technology.

Below are some examples of analog and digital video technologies and equipment:

Analog:	Conventional broadcasting (cable, aerial), TV sets, VCR's, camcorders (VHS, S-VHS, 8mm, Hi8), LaserDisc
Digital:	Satellite broadcasting (DIRECTV, Dish Network etc.), DVD players, DV and Digital8 camcorders

Note that many cable TV companies now offer digital broadcasting through their cable connection, and older satellite broadcasting was in analog format. Also, video (movie) clips one encounters on the Internet in the formats such as RealVideo, QuickTime, Windows Media, and so forth, are types of digital video. In the past the digital video seen on personal computers had poor quality compared to regular TV broadcasting. Today it is possible to view and edit broadcast quality video on personal computers.

Why is Digital Video Editing Better?

Editing video using conventional analog technology involves copying from one VCR to another and causes significant loss in quality unless one usea professional grade equipment. Digital video editing enables intuitive and extremely flexible manipulations and introduces little or no loss of quality. You can preview the result of the edits before finalizing it, and undo the edits that you do not like. The difference between analog and digital video editing is analogous to the difference between using a typewriter and word processing program.

What do I need to get started?

There are three key components for digital video editing:

1. Video source
2. Computer with FireWire (IEEE 1394) interface and cable
3. Video editing software

The video source is typically a camcorder or a VCR. A digital camcorder (DV or Digital8) is ideal, but any standard video equipment (analog video camcorder such as VHS and Hi8, VCR, LaserDisc, etc.) can be the video source.

For effective editing, the computer should have a decent processing power (PC: Pentium II or better, MAC: G3 or better), plenty of memory

(64MB of RAM minimum), and a large hard disk drive—since digital video materials usually contain a large amount of data (and the processing then requires a lot of computational power).

If the video source is digital, then the computer just needs a FireWire (IEEE 1394) interface. If the source is analog, then a device to convert analog video into a digital format (and vice versa) is required.

A wide variety of video editing software is available. Note that FireWire interface kits (you may have to purchase ne) often come with basic video editing software; and also note that most digital camcorders also come with such software. All current Macintosh models come with built-in FireWire interfaces (cable must be purchased separately) and the iMovie video editing software.

The Process of Digital Video Editing

Capture. This is the process where video material is entered into the computer. If the video source is a digital camcorder, then this process simply transfers the video data on the camcorder tape to the computer via the FireWire cable. The video data is stored on hard disk in DV format. It requires about 200 MB of disk space for one min of video.

Edit. Once the video material is captured, you can edit it using video editing software. Most editing software will not actually modify the captured video, but create (*render*) a new file, reflecting the changes you make. Below are the kinds of edits that can be made.

- ✓ Change the sequence of scenes
- ✓ Cut out unwanted parts
- ✓ Insert scenes from other video materials that were captured separately
- ✓ Add extra audio materials such as narration and background music
- ✓ Insert still photos
- ✓ Alter the playback speed

- ❖ Create fade-in/out, scene dissolve (cross fade)
- ❖ Superimpose (overlay) text
- ❖ Apply filters—change hue, brightness, sharpness etc
- ❖ Apply various other effects

The ✓ in the list above indicates that there is no degradation of the video quality. On the other hand, the edits with ❖ require recalculation (*rendering*) of the images, and may cause slight quality degradation (although not noticeable in most cases). What you can do depends on the editing software you use, but even with the most basic software you can perform most of the above.

Export. This is the process in which you *finalize* the edited video. The quality of the original video is retained when you record the result back to the digital camcorder's tape (DV format), except for the minute degradation caused by the rendering of edited portion mentioned above. Other options are to record the video on a regular analog video tape (i.e., VHS—many digital camcorders function as a converter of DV format to analog NTSC), CD/DVD discs, or convert to streaming video format (QuickTime, RealVideo, Windows Media) for viewing via the Internet.

Although there are many inexpensive software products available to make DVD discs, making them is still rather expensive due to the cost of the hardware and media. If you own a CD writer (CD-R or CD-RW), however, it is possible to create CDs in the format called the Video CD (VCD) or Super-VCD (SVCD) that can be played on many stand alone DVD players and on computers. Although these formats allow shorter content lengths (80 min on VCD, 35 min on SVCD), and quality is not as good as DVD (because CD has much less capacity than DVD), these are viable options for archiving and distributing the finished video until making DVD discs becomes more affordable.

Applications

The flexibility of digital video editing makes video you shoot more viewable and interesting. Besides recording the edited video on conventional media (i.e., VHS tape) you can distribute the video on CD-R/RW discs. These discs can be copied more easily, quickly, and inexpensively. The VCD/SVCD format mentioned in the previous section supports a menu system similar to that of DVD discs, which makes easier navigation of the contents possible.

Viewing digital video on a computer with some commercially available video player software allows bookmarking. Such a feature may be helpful in analyzing video footage, such as activities recorded in the classroom.

If you have access to multiple video cameras, shooting multi-angle shots of a single object (a musical instrument being played, etc.) and combining them is easy in digital video editing. Such video can become an effective observation/teaching tool.

General Information on Digital Video Editing

- *Getting Started with Digital Video Editing*
  http://userwww.sfsu.edu/~church/dvsite/start.html
- *Beginner's guide to Digital Video Production*
  http://www.dvmoviemaking.com/
- *What do I Need to Set up a Nonlinear Video Editing System?*
  http://desktopvideo.miningco.com/compute/desktopvideo/library/weekly aa052599.htm

- *Global DVC Digital Videographers Club*
  http://www.global-dvc.org/
- *DV FAQ*
  http://www.adamwilt.com/DV.html#FAQ

FireWire (IEEE 1394) interface kits and related products

- *ADS Pyro DV Series* (PC/MAC)
  http://www.adstech.com/products/intro/products.asp
  http://www.adstech.com/products/PYROPlatinumDV(Cardbus)/intro/API521intro.asp?pid=API-651W
  (for notebooks)
- *Adaptec FireConnect 4300* (PC/MAC)
  http://www.adaptec.com/worldwide/product/proddetail.html?prodkey=AFW-4300&cat=%2fTechnology%2fFireWire-1394%2fFireWire-1394+Adapters
- *Dazzle DV Editor* (PC)
  http://www.dazzle.com/products/vided.html
  http://www.dazzle.com/products/vidednote.html (for notebooks)
- *Dazzle Hollywood DV-Bridge* (analog-to-DV converter) (PC/MAC)
  http://www.dazzle.com/products/hw_bridge.html
- *ATI DVWonder* (PC)
  http://www.ati.com/products/pc/dvwonder/index.html
- *Belkin FireWire cables* (most FireWire kits come with cable) (PC/MAC)
  http://catalog.belkin.com/IWCatSectionView.process?IWAction=Load&Merchant_Id=&Section_Id=1976

Apple Products

- *Current Macitosh models*
  http://www.apple.com/hardware/
- *iMovie Video Editor* (bundled with current Mac models)
  http://www.apple.com/imovie/
- *iMovie related article at ZDNet*
  http://www.zdnet.com/zdhelp/stories/main/0,5594,2781997,00.html

Video Editor Software

- *Final Cut Pro* (MAC)
  http://www.apple.com/finalcutpro/
- *Adobe Premire* (MAC/PC)
  http://www.adobe.com/store/products/premiere.html
- *Media 100 Inc. CineStream* (MAC/PC)
  http://yopu.com/cinestream/
- Ulead MediaStudio Pro (PC)

http://www.ulead.com/msp/runme.htm

- *Ulead VideoStudio* (PC)
  http://www.ulead.com/vs/runme.htm
- *Dazzle MainActor* (PC)
  http://www.dazzle.com/products/m_actor.html

Digital Camcorders

- *Sony - DV / Digital8*
  http://www.sonystyle.com/digitalimaging/minidv.htm
  http://www.sonystyle.com/digitalimaging/digital8.htm
- *Panasonic*
  http://www.panasonic.com/consumer_electronics/camcorder/default.asp
- *Canon*
  http://www.canondv.com/
- *JVC*
  http://www.jvc.com/product.jsp?productId=PRD1203000