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PROCEEDINGS FROM THE SECOND NATIONAL SYMPOSIUM ON MUSIC INSTRUCTION TECHNOLOGY JULY 14-15, 2000

Sponsored by Florida State University Center for Music Research, Auburn University Department of Curriculum and Teaching, and the Music Educators National Conference (MENC)

The Second National Symposium on Music Instruction Technology was held July 14 - 15, 2000, at the Center for Music Research, Florida State University School of Music. The theme of the conference was "Practice and Research." The annual Symposia are projects of the Center for Music Research at Florida State University and the Music Education Program of Auburn University, and are 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 Third National Symposium on Music Instruction Technology was held July 13 -14, 2001 at Auburn University, and the Proceedings will appear in Volume 2 of the JTML. The Fourth NSMIT will be held summer 2002 at the University of Oklahoma.

Summaries of the Symposium presentations appear below.

To China with Love

Carolyn Fulton, Sara Hagen, and Carl Hancock
Florida State University

This presentation was an Internet collaborative event between two sets of conference participants, on two different continents, between three music education doctoral students. Sara Hagen and Carl Hancock facilitated the proceedings from Florida State University, while Carolyn Fulton connected from the I*EARN (International Education and Resources Network) technology conference being held in Beijing, China.

The presentation began with Carolyn Fulton describing the I*EARN Global Children's Music Network as transcribed below.

"Good morning, ladies and gentlemen. It is now approximately 12 hours ahead in the 'Forbidden City' of Beijing, China. My colleagues, Sara Hagen and Carl Hancock, are attempting to use the wonders of technology in order to allow communication between the NSMIT and the International Education and Resource Network conference in Beijing, China. There are two goals this morning. The first is simply to communicate with you. The second is to present the I*EARN Global Children's Music Project and how technology is an essential element. But first, please allow several of my I*EARN conference attendees to greet you and introduce themselves." (At this point, several people from various parts of the world introduced themselves to the NSMIT participants via Internet videoconferencing.)

"I*EARN, or the International Education and Resource Network, is a non-profit, grass-roots worldwide organization of teachers who are connected via the World Wide Web. They have a goal of creating Internet-based projects for their students to participate in, and they hope to make a difference.

"I*EARN founders early realized the incredible strength and bonding experiences that come from holding yearly conferences where teachers meet in person. These conferences are sponsored by various I*EARN countries and require major financial commitments in order to locate resources and partner support, and to keep costs to a bare minimum thus allowing as many I*EARN teachers to attend as possible.

"My first experience at a conference was in a small friendly community one hour outside of Barcelona, Spain. Even the village mayor of Callus supported I*EARN by helping to serve meals that had been prepared in the high school cafeteria by local residents. On several occasions, we were treated to very special cultural events, a wonderful traditional dance orchestra, and traditional dances specific to the Catalan region.

"At that time, I was teaching K-5 elementary music at the International School of Bangkok, and my teaching colleague Kuhn Siriluck Hiri-o-Tappa had invited me to participate in the I*EARN 'First Peoples Art Project.' We journeyed to a very remote hill tribe village of natives on the border of Burma and Thailand, where we exchanged art work from other indigenous

children in the world including Romanian Gypsy children, Choctaw Native American children from the U.S., and aboriginal children from Australia.

"It was during that first soul-filled conference, where I first met colleagues from Eastern Europe, Africa, South America, and everywhere in between, that I started to think about what has become the 'Global Children's Music Project.' The GCMP was proposed as an official I*EARN project during the July 1999 Puerto Rico conference. Teachers have limited time and resources, therefore what you will see today is a 'report in progress' as project participants continue building an intercultural music website.

"The official start-up title to this project was 'Talking Timbuktu: The Global Children's Music Project' (GCMP). A PowerPoint presentation was delivered in Puerto Rico with approximately eight schools initially participating. Each school agreed to submit one song on an audiocassette with accompanying cultural information. The language of the project is English, but song material was submitted in the original language.There were two original goals for this material:

1. The development of a website incorporating all aspects of the GCMP, and
2. The sharing of music and cultural information via audio/CD recording.

"The project is underway and developing as resources and time are available. To visit the website, go to http://otto.cmr.fsu.edu/~fulton_c.

"I*EARN's founders believed that technology is to be used to enhance learning. It is not the end goal, but a tool to use in teaching and learning. With appropriate implementation, it will enrich and support both knowledge and creative development."

How the Connection Was Made

An Internet connection was made with a computer and the following hardware and software.

1. A video camera (Hagen used the Logitech Quickcam) and its accompanying software,
2. NetMeeting software, available as a free download from http://www.microsoft.com, and
3. A Hotmail Microsoft Network (MSN) account, also free at http://www.hotmail.com.

When these items are in place, the MSN Messenger Service on the Internet can be opened to list all contacts that the owner of the account designates within the system. Owners may choose to be listed in the directory. The service identifies those online and those not logged on. An invitation is sent to an online contact to join in a meeting that is routed through NetMeeting to

make audio and visual contact. If one does not have a camera, the software can only provide audio.

For this demonstration, Hagen and Fulton first practiced from their homes across town. Even then, the video quality was less than perfect. Modem speeds and connection speeds will influence the quality. Another influence in quality is network congestion. If the "highway" has a lot of traffic, the video stream is disconnected more often, giving a "pixilated" or chunky quality to the picture. Jerkiness in the movement occurs as well because the movements are too subtle to transmit fluidly. The connection can be made from anywhere in the world using the Internet since the structure of the MSN Messenger service is global. After Fulton arrived in China, she and Hagen met several times online, each time with varying degrees of success in terms of quality of video and audio. The live connection at the conference on Friday morning was one of the best connections the students had experienced. The audio was very clear and the NSMIT attendees were able to see and hear many of Fulton's colleagues from various parts of the world who were attending the I*EARN conference.

The experience was an example of how the Internet can bring our world closer together, blurring the lines of time and space for interactions among people from around the globe.

A Systematic Approach to Making MIDI More Musical

Brian Gaber
Florida State University

Many involved in music technology have felt musically disappointed in the results of arduous labor regardless of the time and money spent searching for the best equipment. What is needed is not always a new keyboard or even a few sequencing "tricks" but a considered approach to creating music in an electronic medium.

Using Technology to Achieve the National Standards

Brian Gaber
Florida State University

This discussion will focus on two of the National Standards that are often difficult for teachers to implement: Improvisation and composition.

If You Don't Know Where You're Going, How Will You Know if You've Arrived?

John Deal
Florida State University

The presentation addressed the importance of well-defined educational goals and objectives that must be established in order for technology to be an efficient means of providing instruction.

The Power of Technology: Uniting Technology and Curriculum in Grades K - 5

Martha Stubbs
Stubbs Music Center, Tallahassee, FL

During this session we will explore music software that is appropriate in any music curriculum for beginners through early intermediate music students.

Music Instruction Technology: Accessibility Guidelines and Assistive Devices

Diane Gregory
Florida State University

During the last three years the reauthorization of two federal laws has strengthened states' efforts to increase the availability and applications of assistive technology. The Technology-Related Assistance for Individuals with Disabilities Act (PL 100 - 407) of 1988 was reauthorized ten years later in 1998 as the Assistive Technology Act "to increase the availability of funding for access to, and provision of assistive technology devices and services." In 1990 the Individuals with Disabilities Education Act (IDEA) (PL 191 - 476) promoted the use of assistive technology for students with special needs. Seven years later in 1997 the IDEA reauthorization *mandated* that individualized education and transition planning conferences include the evaluation of a student's needs for assistive technology. This timely reauthorization dovetailing also coincides with the current interest and support of music instruction technology. What are the connections?

The legal definition of assistive technology (AT) includes any tool (low tech/high tech) that "increases the independent functioning" of an individual. Some assistive devices, therefore, apply to mobility, posturing, and

augmentative and alternative communication (AAC). The assistive technology category that seems most relevant to technology-based music instruction is labeled "computers—with and without adaptation." It is apparent that an "unadapted" computer with standard music software provides many alternatives for music participation. Take, for example, the alternative for "writing" music notation. This particular application may be a luxury for some students but is consequential for a student who, because of physical difficulties, may not be capable of writing legible music notation. By pressing keys, the student circumvents the complex visual/motor task of writing with a pen or pencil and produces computerized music notation to share with an instructor and other students. This example illustrates how using a computer in music instruction is an application of assistive technology that serves to increase accessibility to *music* for all students. If this is the case, however, then accessibility to *computers* becomes an equally important issue for music educators.

If a student has low vision or is blind an "unadapted" computer is inaccessible. The same is true for students who may be hard-of-hearing or deaf, have trouble reading or cannot read. The standard computer may be inaccessible to students who have difficulty moving or are totally paralyzed. Typical computer behaviors that are often taken for granted, such as reading a screen, moving a mouse, typing on a keyboard, and receiving information through multimedia obviously become problematic for many students and teachers using technology-based instruction. By pairing a student's ability (can talk, can fix eye gaze, or can recognize speech) instead of disability (cannot type or cannot read text) with available adaptations and devices, education evaluation teams begin the process of providing access to computers.

Engineers have developed many medium and high tech assistive devices to override, compensate for, or circumvent standard computer access behaviors. The target consumer group, in many cases, is the general public rather than people with special needs. Other devices are obviously designed for specific accessibility applications. Tables 1 through 3 provide a very small but representative sample of devices that are reported in the literature.[1] Web site addresses provide additional information.

If current practice is any indication of the future, it is safe to assume that engineers will continue to develop "user-friendly" hardware to retrofit the standard computer. In the meantime, how can music educators and software developers promote accessibility? Perhaps an awareness of accessibility issues and knowledge of available devices will help music educators select software that, in addition to meeting pedagogical criteria, is designed to require minimal adaptation for receiving and communicating information. Educators may also provide helpful information to AT evaluation teams about necessary devices for individual student access to technology-based music instruction. Likewise, designers of music instruction software who ask accessibility questions during the creation of new materials or revisions of existing resources may simultaneously broaden the user base and

minimize the need for adaptations or assistive devices. In fact, the multisensory approach for conceptualizing "accessibility" seems totally consistent with the instructional principle of providing multiple input/output options for all interactive learning processes. Computers can facilitate the learning process. Assistive devices can facilitate computer accessibility.

[1]See Gregory's article in this issue.

School Musicians' Attitudes toward Hypermedia Enhanced Rehearsals: A Pilot Study

Kimberly C. Walls
Auburn University

Preservice music teachers lack practical models of how to incorporate technology into rehearsals in a manner that increases musical understanding and appreciation because they have not experienced learning in such an environment. In 1993, Dunnigan reported that although nearly half of 744 band and orchestra directors in Michigan used computers and 4.6% of them used computer-assisted instruction, none reported using computers for group presentations.

Yarbrough (1993) has suggested that technology has potential to aid music education in expanding the curriculum. She exhorts professors and future teachers to collaborate with teachers and children to create sorely needed software. By participating in software development, teachers can learn both "the technologies and the subject matter of the programs they are developing." In 1997, Wang and Holthaus reported that over half of 110 student teachers who responded to a survey indicated that they used computers with children, but only 13% used computers for multimedia. Computer trainers of inservice teachers assert that teachers are more likely to use computers in their classrooms if they create materials that they actually use in their classrooms. (Kopp & Ferguson, 1996; Wetzel, 1996; Wiesenmayer & Meadows, 1997).

Colleges and universities must take the responsibility to provide models of how to best use computers in music teaching and encourage undergraduates to create their own ways of teaching with technology. Although preservice teachers may question the emphasis on technology in education methods courses, Smithey & Hough (1999) report that in some cases when students are required to create their own multimedia classroom resources and use them in practica, they become technology advocates. McCormack (1995) reported that elementary education majors gained multimedia authoring skills and demonstrated those skills in their lesson planning and teaching for a 12-week practicum. The majors also indicated on surveys that they recognized the value of integrating of technology into teaching.

This paper describes a music education practicum that was designed to give undergraduates hands-on experiences teaching a composition to middle school and high school band and choir students. The course assignments included selecting a composition with the assistance of the cooperating band or choir director, writing and conducting rehearsal plans for the composition (including sight-reading the composition), and developing a multimedia companion for the composition to present at a rehearsal. It was hoped that through the projects the undergraduates would not only experience a "slice of life" by having to teach a composition from scratch, but that they would learn how to construct learning experiences that address more than simply how to play or sing a piece of music. By building their own multimedia presentations, the students could generate new ideas for incorporating technology into rehearsals and for presenting structural and sociological aspects of music to adolescents.

The purpose of the study was to (a) examine the feasibility of presenting information-rich multimedia music learning resources during school rehearsals and (b) measure the changes in attitudes of ensemble members toward musical compositions presented in this manner. The research questions were as follows.

1. What is the feasibility of using a comprehensive musicianship approach to create and present a hypermedia program in band and choir rehearsals?
2. How do students' attitudes toward band and choir compositions change as a result of incorporating comprehensive musicianship hypermedia presentations into rehearsals?

It was expected that students' attitudes toward the compositions would improve (Finnas, 1989; Hargreaves, 1984; Shehan, 1986), but it was unknown how the use of multimedia might relate to the amount of attitudinal change.

Method and Procedures

The participants in the study included 13 junior and senior undergraduate students who were enrolled in a music education practicum at a large Southeastern university during Spring 1999. The practicum teachers' class schedules were examined and compared to local school schedules to assign each of them to a school band or choir program with one of 10 cooperating teachers. Each practicum teacher spent a minimum of three hours per week teaching in the school and assisting their cooperating teacher, focusing upon one school ensemble for the lesson plans and hypermedia. Six practicum teachers worked with middle school band, two senior high school band, two with middle school choir, and two with high school choir. The cooperating teachers' years of teaching experience varied from 1 to 23 years.

The cooperating music teachers assisted their practicum teacher in selecting a composition that would be appropriate for the focus ensemble.

Each practicum teacher analyzed the composition for form and aesthetics as well as historical, cultural, and sociological relationships. Then they devised desired outcomes and planned strategies to obtain the outcomes by incorporating hypermedia into the rehearsal. They authored a hypermedia teaching companion for the composition based upon the analysis, outcomes, and strategies. The authoring assignment was structured as a template so that links to sections for information about the composer, music theory concepts, performance trouble-shooting, historical and cultural connections, form, warmups and technical exercises, aesthetics, creative activities, and sources might be filled in with text and graphics from their analysis. Practicum teachers were free to design their own multimedia format if they preferred to do so.

The practicum teachers planned a five-rehearsal sequence for their focus ensemble. The sequence included a sight-reading session, two 15-minute rehearsals without computer technology, and two 15-minute rehearsals incorporating the hypermedia. They also designed and administered a short quiz to assess student learning. School band and choir students who had provided written assent were asked to complete two identical anonymous surveys concerning their opinions of the composition and the rehearsal (once after the second rehearsal and once after the fifth rehearsal). The survey included questions about student demographics.

The practicum course met once per week for seminar. Two of the seminars consisted of instruction in, and practice of HyperStudio skills including how to edit the shell stack (template). HyperStudio tutorial CD-ROMs and workbooks also were distributed to the students. They were given instructions on how to download a demonstration version of the authoring program so they might work on the projects at home.

The practicum course materials included a description of the lesson plan, assessment, hypermedia assignments, and a week-by-week schedule of assignments which was to be interpreted loosely, depending upon the cooperating teacher's plans and school schedule.

The hypermedia companion products, written self-reports of experiences in the schools, and verbal reports presented in seminars were considered in estimating the feasibility of presenting hypermedia in band and choir rehearsals. The band and choir students' attitudes toward band and choir compositions were estimated based upon their survey responses.

Results

Every practicum teacher was successful in completing an attractive hypermedia product that addressed aspects of the comprehensive musicianship approach to a school band or choir composition. Due to scheduling and equipment problems, only 5 of the 13 undergraduates presented their projects to the focus ensembles. Three of the presentations were transferred to video tape for presentation on school-owned equipment and two of the presentations used a university-owned computer projection device. The computer projection device failed at both presentations so the teachers resorted to

presentation via the screen of a laptop computer. (At one presentation, a child accidentally loosened a cable, at the other presentation, both projector lamps failed.)

Hypermedia was used in several different ways by the practicum teachers. Most of them printed information from their project and distributed it to their students. Two of the teachers delivered their projects on videotape as a quiz review. Another administered a timed quiz that had been printed to videotape. Two other teachers presented new information about the music through projection of their products.

Only two of the focus ensembles returned both student surveys. One of those focus ensembles was a middle school choir. The mean age of the 18 respondents was 13 years (SD = .65). The middle school respondents included 4 males and 14 females. The other focus ensemble was a high school band with a mean age of 14.5 years (SD = 1.63); 4 males and 31 females.

The composition used in the middle school choir was "God's Gonna Set This World on Fire" a SATB arrangement of a traditional spiritual by Moses Hogan. The practicum teacher used PowerPoint to create a timed quiz about spirituals, minstrels, and the blues which used flying text and sound effects to present each question. The slide show was transferred to video tape and was presented on school-owned equipment.

The composition used in the high school band was "Beach Boys Medley" by Mike Story. The information in the hypermedia companion included photos of the Beach Boys and a definition of medley. The practicum teacher had sole responsibility for rehearsing the medley and conducting the band when it was performed it at the spring concert. The instructor set up a laptop and projector so the practicum student could present the program to the entire class, but the lamp did not work, so smaller groups of students gathered around the laptop to view the program after the class had rehearsed and played through the medley.

Attitudes of "liking" the composition increased for the middle school choir and decreased for the high school band, though neither change was significant. Attitudes of "interest" in the composition also improved, to a significant degree in the middle school chorus. "Liking" the rehearsal also improved in each setting, but not to a significant degree. The only significant changes in attitude for both groups were for Question 4, "Please rate how INTERESTING the REHEARSAL was today by circling one response." Mean attitudes for each group significantly improved after being exposed to the hypermedia presentations. (See Table 1 for survey statistics.)

Examination of the free responses from the second survey may lend insight about why students were more interested in the class activity when hypermedia was presented. Middle school choir members were enthusiastic about the hypermedia quiz. "I liked it when it was PowerPoint." " I liked the animation." One student commented on the sound effect introducing each question: "drum beat." "Well it was better using getting some paper taking it." "We had enough time to write an answer." "I thought the power point was really cool." "It was neat and not boring like a regular quiz." "It was very nice and I like the way it was on the TV." "It was different."

Table 1

Descriptive Statistics and One-Tailed Paired t-test Results for Survey Attitude Questions

Middle school choir	*M*	S^2	*M*	S^2	*df*	*t*	*p*
Liked composition	4.00	.13	4.18	.15	16	-0.40	.34
Interested in composition	3.47	.55	3.87	.40	14	-1.87	.04*
Liked rehearsing	3.81	.30	3.88	.25	15	-0.37	.36
Interested in rehearsal	3.38	.52	3.94	.33	15	-2.76	.01*
High school band	*M*	S^2	*M*	S^2	*df*	*t*	*p*
Liked composition	4.17	.41	4.08	.34	23	.62	.27
Interested in composition	3.75	.54	3.96	.30	23	-1.04	.15
Liked rehearsing	3.63	.59	3.75	.72	23	-0.72	.24
Interested in rehearsal	3.55	.89	4.00	.53	19	-2.65	.01*

* $p < .05$

The high school students enjoyed having a short rehearsal. "Rehearsal was short." "It was short and fun." "The rehearsal was short and to the point." They also found the hypermedia to be interesting. "I liked the computer stuff. It was interesting." "The computer thing was cool." "I really like going to see the website." "Ms. [X] showed us a short film about our song." "It was very interesting to know the stuff about the person who wrote the music."

Discussion

The results of this study indicate that it is feasible to use a comprehensive musicianship approach to create and present a hypermedia program in band and choir rehearsals. All of the students except for one self-proclaimed technophobe expressed that they enjoyed learning how to use the authoring program but that they felt pressed for time. Each practicum teacher completed a hypermedia product based upon a school band or choir composition. Fewer than half of them, however, were successful in using the hypermedia during a rehearsal. Several suggestions may be made based upon their comments and the comments made by the practicum teachers.

Adequate time must be allowed for the process of rehearsal planning and hypermedia development. Scheduling the course activities in the spring quarter was a disadvantage because the time allotted to complete assignments was compressed due to schools ending for the summer before the university term was over. A 15-week term would make it easier to complete all the assignments. The majority of the practicum teachers had never dealt with school teaching schedules, planned rehearsals, nor conducted entire classes, so they were not used to allocating time for teaching preparation.

Preservice teachers could complete a first draft of their assignments at a more comfortable pace in courses prior to the actual teaching practicum.

Computer labs also must be open at convenient times, a suggestion noted in other teacher training reports (e.g., Owen & Rowlands, 1992). Late evenings may be the best time for students to work on time-intensive projects, especially for music majors who have concert and rehearsal obligations.

The course instructor must be willing to teach the practicum students how to use the technology in case guest instructors are not available. Particularly if computer skill training is to take place early in the morning, undergraduate students should not be allowed optional attendance. Universities must provide access to portable computers and projectors since many music teachers do not have or do not know if they have access to such equipment at their schools. The equipment operation must be checked before it is taken into the schools.

It seems that a one-shot presentation of hypermedia information does not change students' attitudes toward band and choir compositions, but they do find rehearsals to be more interesting when media is presented. Band and choir students may simply find the novelty of the experience appealing. How long the technology would continue to be motivating will remain unknown until more research is done that incorporates hypermedia into rehearsals on a regular basis.

Some of the students indicated they thought that learning more about the background of a composition made rehearsals more interesting. Perhaps using media in a rehearsal helps teenagers realize that they are learning something about music itself, they are not "just" playing or singing. This idea deserves investigation. Part of learning is realizing that learning has occurred.

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Using Technology with the Orff Schulwerk Approach

Marilyn Davidson
Bergenfield, New Jersey

This presentation was a demonstration and hands-on workshop of music teaching that utilized technology, with emphasis on using technology in the Orff Schulwerk approach. These innovative lessons are part of the *Music with MIDI* Grades 1-6 series that accompanies *Share the Music.* The series uses a standard music sequencing program to reinforce lessons in the texts and emphasizes using technology and creativity on the part of the students toward this end. The lessons include strategies for preparation and classroom management.

Interactive Online Music Lessons

Sara Hagen
Florida State University

This presentation was designed to describe and to demonstrate "live" two new commercial Web sites that are available to music teachers for fall of 2000. They are Full Tilt Music's Online Conservatory and GVOX's NotationStation.

I. Goals of the Lessons:
- A. Reinforce the regular lessons in units of *Share the Music* with the Orff Schulwerk approach
  1. Enhance the unit lessons, not extend them unrealistically
  2. Make lesson content more dynamic and memorable through the technology experience
  3. Emphasize music literacy skills, student creativity, and student self-evaluation
  4. Aid the teacher in reinforcing National Standards and in providing assessment

(Continued)

B. Encourage student creativity in the limited time allocated to general music class
   1. Provide a dependable orchestration with which to improvise
   2. Capitalize on the inherent motivation of computer and MIDI technology experiences
   3. Make orchestration choices more accessible to students
   4. Provide realistic extensions for the technology lessons

C. Facilitate learning the provided Orff instrument orchestration
   1. Become familiar with the entire orchestration through the lessons
   2. Practice individual parts individually and later hear the entire sequenced orchestration
   3. Provide a score of the orchestration for the teacher

D. Help with classroom management when using technology in the music classroom
   1. Suggest introductory and preparatory activities for the entire class, under teacher direction
   2. Provide resource masters for individual and small group preparation and practice away from the computer (masters remind students of what they will do at the computer)
   3. Give clear suggestions to students and teachers for completing projects at the computer

II. Example 1: *Frere Jacques (Are You Sleeping)*, page 86 (See score, page 92) - *Share the Music* Book
   A. Lesson 14A: Create and perform an Orff instrument orchestration
   B. Lesson 14B: Create and perform a new melody using *do, re, mi, so,* and *la*

III. Other examples in Grade 2:
   A. *I Have A Car* (An extension of the traditional music sequence)
      1. Lesson 2A, page 8: Choose "special effects tone colors"
      2. Lesson 2B, page 10: Compose a melody using *mi, so,* and *la*
   B. *Who's that Tapping at the Window?*
      1. Lesson 18A, page 112: Create a rhythm interlude
      2. Lesson 18B, page 114: Create an ostinato and a melodic interlude, using *do, re, mi, so,* and *la*

IV. Example 2: *Li'l Liza Jane*, page 162 (See score, page 168) - *Share the Music* Book 5
   A. Lesson 19A: Create a new pentatonic interlude
   B. Lesson 19B: Create a simple rhythmic variation of a melody

V. Other examples in Grade 5:
   A. *Erie Canal*
      1. Lesson 9A, page 72: Improvise question-and-answer phrases
      2. Lesson 9B, page 74: Play the bass metallophone/bass xylophone part
   B. *Swing Low, Swing Chariot* (An extension of the traditional music sequence)
      1. Lesson 11A, page 98: Create and play a new orchestration
      2. Lesson 11B, page l00: Create two complementary four-beat percussion ostinatos

VI. Brief description of other new integrated *Share the Music* technology components:
   A. Other lessons in *Music With MIDI*
   B. *Music Ace 2* (Pitch and Rhythm Reading and Creating for Grades 3-6+)
   C. MIDIsaurus (Beginning keyboard and related music concepts for Grades 1-3)
   D. *Interactive Recorder CD-ROM* (G-Vox) (Learning BAG on soprano recorder for Grade 3
   E. *Music Time Lessons* (Music Reading and Writing for Grades 3-8)

Why Online Music Lessons?

A legitimate question to ask might be "Why use the Internet to teach music lessons?" There probably are many reasons why *not* to use the Internet that traditional teachers would suggest– such as the changing nature of technology, the complexity and lack of stability of network systems, and the limited understanding of what teachers and students need to know in order to participate successfully. Others believe that education may become too commercialized, while some think that students and faculty may become isolated working individually at computer stations. Perhaps the most alarming and understandable of the concerns is that standards may be reduced due to lack of teacher-student contact. Students may not be getting the same kind of instruction as they normally would in a face-to-face environment.

While these are justifiable concerns, the bottom line is that there is not enough empirical research to support or discredit the criticisms. One key reason given for successful distance education programs is the capacity for immediate interaction between teacher and student (Boverie, Gunawardena, Lowe, Murrell, Zittle, and Zittle, 2000). "Teacher immediacy" contributes to the satisfaction of students of all ages and provides a sense of "social presence" (Hackman and Walker, 1990; Rafaeli, 1990).

There are, indeed, some good reasons to include the Internet as a valuable tool in the teaching of music lessons. Research does provide evidence that adults, especially, may benefit from online lessons in a number of ways. For instance, many do not have teachers that are readily accessible or have time constraints that do not fit well with music teacher's schedules. With online lessons, time and place is irrelevant for the most part. If one needs lessons early in the morning in California, perhaps one could connect with a teacher in New York at a more convenient time. Many adults prefer a level of anonymity as well, or being able to come to piano lessons in pajamas! Since video is optional, there need not be any visual connection at all (one of the shortcomings as well). The Internet can provide a social outlet for many adults looking for another adult who can listen and talk with them about a shared interest like music. Finally, online lessons fit the constructs of adult learners who are goal- and task-oriented, eager to work and learn—and are capable of doing so independently—and take an intellectual approach to lessons that fits well with the limitations of audio only interfaces.

Benefits for children may be slightly different, including the highly motivational factor of "playing" on the computer in this novel situation. However, this form of lesson may also be particularly attractive to students who are looking for alternatives to traditional piano lessons or as supplemental study to their usual lessons. Students may have just as much trouble finding a suitable teacher and their time is getting more and more difficult to manage as well. Finally, they benefit from having a caring adult in their lives, whether it is in person or on the Internet, because listening is one of the most important things an adult can do when working with children. Anonymity and distance may be a welcome respite for youngsters, too.

Some Shortcomings

Certainly there are recognizable shortcomings of this technology. First, networks and technologies can and do fail on a fairly regular basis. The lack of a face-to-face human interaction may not be appropriate for some learners. In addition, children may not be self-motivated enough to thrive in this environment. Online piano lessons may not be appropriate for starting children on the piano—with or without video—as they need more physical encouragement about posture, hand position, and so forth. As always, the sound is only as good as the system with which the student and the teacher are working. But isn't this true with regular piano lessons? Many students practice on substandard pianos that are out of tune. Online piano lessons are taught on electronic pianos that are in tune and work consistently when well maintained. The new electronic keyboards have many functions that make piano lessons fun and challenging, albeit a different experience than that on a traditional acoustic piano.

These are value choices as well as convenience and interest choices. One of the strengths of today's society is the number of choices available to consumers to "have it their way" and this is one way that music may become more accessible to students who might otherwise not have the opportunity to study music.

Full Tilt Music

Full Tilt Music (FTM) is the premiere source for quality education on the Internet, according to their advertised profile. The goals of the company include using the Internet to offer live music lessons anywhere, any time, and any place. They also want to extend the availability of additional music education resources. The team, made up of music, business, and Internet professionals, has developed the technology and infrastructure to deliver piano lessons live on the Internet. Their intent is to revolutionize music education and to partner with music educators to build a new kind of learning community. In addition, they are committed to make the transition from traditional lessons to the Internet as "painless, practical, and profitable as possible" (http://www.fulltiltmusic.com). Using the universal MIDI standard and two-way voice communication (with video optional through NetMeeting software), the Online Conservatory offers real-time interactions that are free from time zone or geographic boundaries. The company is constantly moving forward with new ideas, most recently, with the release the latest version of their software, now called *Melodus*. This release will allow recreational users to come together to jam and share music over the Internet. This release will create a large, pre-qualified market already using the software, familiar with its capabilities and having all the equipment and they will be marketing to these recreational users directly to sell lessons. The software now is available online.

In the summer of 2000, FTM offered an early-bird trial to teachers who wanted to try their system. Over 20 teachers signed up and began to teach online lessons with support from the Online Conservatory staff. In the fall

they plan to offer the following to interested teachers: (a) technology for LIVE online piano lessons, (b) a custom-built Web page, (c) E-commerce transaction processing, (d) curriculum storage and development, (e) community features and personalization, (f) Web-based e-mail, (g) student referrals and teacher recruitment to create online music schools, and (h) support and documentation.

NotationStation

GVOX opened a Web site for music teachers that offers online notation using the *MusicTime* software package, available for free download to teachers, which they acquired from Passport. This site was officially launched on May 10, 2000 with the stated purpose to extend the teacher's reach beyond the classroom. "NotationStation.net provides an immersive collaborative environment to make the music they learn in school come alive" (http://www.notationstation.net). It is compatible with Netscape's *Navigator* and Microsoft's *Explorer* 4.0 and higher with the Mac version available as of July 8, 2000.

In addition to the *MusicTime* software, which is fully operational online without a MIDI keyboard in real-time, teachers and students can also upload *Encore* and standard MIDI files. The online software imports and exports MIDI files, contains a notes palette up to 32nd notes, allows time and key signature changes, transposition, separate voices assignments, and adjustable tempos. Input options include clicking in notes with a mouse, playing the virtual keyboard or using the QWERTY keyboard, using a MIDI device, and playing or singing into a computer microphone. NotationStation provides a free Web site for teachers, where they can upload and manage their lessons. GVOX and McGraw-Hill plan to introduce "Share the Music Interactive Recorder," which will allow for digital recording of student's home practice for later assessment by the teacher. Finally, the lessons created by NotationStation, and by teachers who wish to share, will become part of a database for all teachers to access for ready-made lesson plans.

Conference Demonstration

As an early bird teacher, I recruited two former students from my studio in North Dakota. One was willing to join me in demonstrating the software live early on a Saturday morning, as she was in another time zone as well as 2000 miles away! We had experienced a few lessons prior to the conference and had made good progress working out the technologies and how to best work through the lessons. One difficulty was the inability to have her wear a headphone/microphone set (recommended), as her sound card did not have a headphone jack. Because we must be in an open-air environment, I experience a disruptive echo that we continue to try to work around. We are able to communicate easily with the software provided by the Online Conservatory as well as hear and see one another's piano playing on the screen. I have a video camera so she can also see my demonstrations. Online Conservatory plans to add a video for two-way visual connections in real-time.

Video will be added to their site when bandwidth improves and more consumers have video in their homes—several years away, according to their representative at the Music Teachers National Conference in Minneapolis, MN in March, 2000.

While neither Web site offers notation and score reading as well as live interactions, I found that the combination of the two sites provided a complete environment for teaching. I prepared sight reading, theory and composing activities, uploaded them to NotationStation (using *Finale*-created standard MIDI files) and then use them during and in between the online lessons. A chat line is also provided should audio signals be lost. I found that the chat line was also helpful in clarifying anything that may not have been clear, as well as writing out assignments, which could be saved for further reference.

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A Survey To Assess The Technology Literacy Of Undergraduate Music Majors At Big-10 Universities: Implications For Undergraduate Courses In Music Education Technology

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The integration of technology is a welcome addition to the K-12 music curriculum. As with all new teaching materials, teachers need to be properly educated on correct use and implementation of this technology. A growing number of pre-service teachers are learning the specifics of technology in music education technology methods courses as part of the undergraduate curriculum. It is understood that as the technology awareness and skills of incoming undergraduate students change, the curriculum of music technology methods courses must adapt to these changes.

Up to this time, there has been only limited research to design a tool that assesses incoming undergraduate technology experiences and attitudes both in musical and non-musical settings at specific universities (Hess, 1999, Meltzer, 1999). The purpose of this study is to develop, test, and administer such a tool whose findings might be generalized to similar populations. This study had the following objectives:

1. Determine the status of freshman music students' technology experiences at Big-10 Universities.
2. Assess relationships between the technology attitudes, knowledge, and skills and specific demographic information.
3. Determine indirectly the uses of technology by these students' high school music teachers.
4. Analyze these relationships as a basis for designing the curriculum of undergraduate music technology courses.

Procedure

The survey is comprised of two main sections: demographic and the Technology Experience Questions (TEQ). The demographic section contains various questions concerning four locations and types of interactions with technology: (a) music technology at school, (b) general technology at school, (c) general technology at home, and (d) music technology at home. Other questions concerning gender, age, high school location, setting, and size are also included. The TEQ section contains three components. The Abilities and Awareness component (10 Likert-style statements) asks the participants to compare their skills to other students. The Perceived Control component (7 Likert-style statements) asks the participants to rate their level of comfort while using computers. These two components are taken in part from the study by Kay (1993). The third component, Technology Knowledge, contains five open-ended questions based on material from the syllabus of a music technology methods course.

Prior to final data collection, the survey was reviewed by graduate students, faculty, and the director of a university survey research laboratory. After revisions, it was pre-piloted with a small group of undergraduate music education students in an open setting and then piloted with all the freshmen music majors at the University of Illinois ($N = 97$) during the fall of 1999. Final data collection took place during February, 2000.

Analysis of data relating to freshmen at the 11 "Big-10 Universities" (U.S. News and World Report, 2000) show that these schools share many demographic characteristics including school size, costs, and academic achievement levels. However, these characteristics varied significantly at Northwestern University. Therefore, it was eliminated from the population. Purdue University was also eliminated because it does not offer degrees in music. Of the nine schools remaining, five were chosen at random including: the University of Illinois at Urbana-Champaign, the University of Iowa, the University of Michigan, Michigan State University, and Penn State Univer-

sity. The surveys were administered by the researcher during music courses at each of the respective universities.

Results

Demographics

Three hundred and eleven freshman music majors completed the survey resulting in an 83% return rate. Of these students, 41% were male and 59% were female. A majority of students indicated they attended a high school in a suburban setting (51%) with a high school population larger than 1000 students (65%). An equal percentage of students indicated their major as music performance (40%) or music education (40%).

Relating to general technology use in high school, almost all the students indicated they have used word processing software (97%) with much lower percentages of students using other types of software (e-mail, 46%; spreadsheet, 42 %; web 31%; graphic, 31%; database, 20%). Fifty percent of the population indicated they took a general computer course, most often a keyboarding, or introductory course.

Music technology

Relating to music technology use in high school, 62% (n = 192) of the students responded that they or their music teacher used computers or technology in some way. Of those students, 95% indicated their music teacher used technology for administrative uses, and 75% indicated their music teacher used technology to prepare teaching materials. Thirty-one percent of the students interacted with technology directly when their music teacher used technology to lead classroom activities (31%), or used it hands-on as part of their ensemble class (35%). Sixty-six students (35%) participated in a nonperformance music class (such as theory or composition) where they used technology as part of that class. Students indicated they used music technology at school for the following activities: listening (50%), reading/writing music (50%), composing (48%), playing (35%), singing (25%), or improvising (17%).

Ninety percent of the students had a computer at home with 84% of these students having access for four years or more. They used their home computer quite often for general uses with 76% indicating they used it on average of three hours a week or more. Only 33% of these students used their home computer for musical activities. Of these, most common activities were composing (67%) or creating notation (66%). A much smaller percentage of these students used their computers for music history or research (29%), burning CDs (27%), or ear training (12%).

TEQ analysis

On the Abilities and Awareness component of the TEQ, the mean score was 4.2 (SD = 1.0) or just above "Average" on a scale from 1 to 7. On the Perceived Control component, the mean score was 4.6 (SD = 1.3) or just below "Above Average" on a scale from 1 to 7. On the five open-ended

Technology Knowledge questions, the average number of answers scored "Correct" or "Near Correct" by each student was 1.0 (SD = 1.5).

Effect size and t-test analysis determined that significant differences are present on all three components of the TEQ for four of the nine demographic sub-groups studied (See Table 1). These four demographic subgroups listed in order of most significance are:

1. students who used music technology at home.
2. students who are male.
3. students who used music technology hands-on as part of ensemble class.
4. students who indicated their music teacher used technology in some way.

Those students who participated in a nonperformance music class that used technology scored significantly higher only on the Technology Knowledge component of the TEQ that those who did not. Differences in choice of major, high school setting or size, or participation in a general computer course showed no significant differences in TEQ scores.

The increased amount of direct interaction using technology hands-on in some way appears to be a unifying factor of these four significant subgroups. Consistently, a larger percentage of students in the significant categories are using technology hands-on and using technology more often. For example, 43% of the students who indicated they used music technology at home also used computers at school in a nonperformance music class that used technology. In comparison, only 32% of the students who did not use music technology at home participated in a nonperformance music class. Similarly, male students, those who used computers hands-on in ensemble class, or those whose music teacher used technology are more likely to use their home computer for musical activities and are likely to use it more times a week.

Conclusions

Overall, all students in this study have had some experience with computers, but their levels of technology literacy are quite varied. The data also support previous research showing a positive correlation between attitudes and efficacy levels with actual hands-on experience using technology. The data also show that while many students have used music technology on occasion, their level of music technology knowledge is extremely low. Overall, those students who have the highest scores on the TEQ are those who are male, used music technology at home, and had a high school music teacher who provided opportunities for hands-on use of technology as part of the music ensemble class. It is somewhat surprising that music technology activities were often a critical factor on the scores of the TEQ since only the Technology Knowledge component contained any questions relating di-

Table 1

Mean Scores of Demographic Sub-Groups with Significant Differences Between TEQ Scores

Demographic Sub-Group	TEQ Components		
	Abilities & Awareness	Perceived Control	Technology Knowledge
Music Technology Used at Home			
Yes	4.8*+	5.2*+	2.2*+
No	4.1	4.4	0.5
Gender			
Male	4.6*+	5.1*+	1.5*+
Female	4.0	4.3	0.8
Students Used Hands-on in Ensemble Class			
Yes	4.8*+	5.1+	1.8*+
No	4.2	4.6	0.8
Music Teacher Used Technology			
Yes	4.4+	4.8+	1.2+
No	4.0	1.1	0.7

Note. * = Effect size difference between the two sub-groups is > 0.5
+ = $p < .05$

rectly to music technology. The increased amount of time of overall technology use by these students might explain the differences in scores.

The structure and setting of technology interaction appear to be important factors. It seems that students learn the most about music technology when they are in the nonstructured setting of their home, doing activities they are self-motivated to pursue. Computer interactions with possible non-student designed activities, such as those experienced in a general computer class or a nonperformance music class that uses technology, do not appear to raise the level of understanding or comfort. However, it does seem that the music teachers themselves do play a crucial role in their students' technology understanding and comfort level. Those music teachers who are using music technology appear to encourage home use of technology by their students. In addition, males are interacting with technology more often than females.

Implications

Based on this study and other current research, a number of recommendations for improving the teaching of technology to undergraduate music education students surface. First, a dedicated music education technology course allows these students, with relatively low understanding of music technology, to focus on learning these skills in a dedicated environment.

This environment allows for having support available while learning how to use new hardware and software. Because this course emphasizes applications with technology, the assignments can focus on more in-depth and creative uses of music technology as well. Ideally, several levels of music technology courses should be offered to accommodate the skills and interests of the students.

A freestanding music technology course, however, neither teaches all the skills necessary, nor teaches in the most appropriate setting. Therefore, it is recommended that all efforts be taken to integrate technology learning throughout the entire music education curriculum. In this way, the learning is extended over several years, is learned at relevant times, and provides opportunities to learn some of the administrative uses of technology. For example, students might use word processing and graphic software to create a sample concert program in an introductory music education course. They can then learn how to use accompaniment software while learning secondary instruments, and then use notation software to make arrangements for use in a conducting course. If technology is going to be integrated into the music education curriculum, it is crucial that the instructors feel comfortable using the software and hardware themselves. Therefore, training and support must be made available to the faculty members. Training can either take place in-house or by sending faculty members to courses such as those sponsored by the Association for Technology in Music Instruction (ATMI) or the Technology Institute for Music Educators (TI:ME). Some universities have supported the teaching of faculty by hiring a "technology champion" or by team teaching courses with one member teaching just the technological aspects. It is important to note that in order to properly integrate technology throughout the entire music education curriculum long-term systematic planning is needed with the support of administrators, support staff, and faculty.

The teaching of proper technology use should not stop once the students graduate. Instead, we should also help practicing music teachers use technology more effectively in their classrooms by offering staff development courses in music technology. Effective strategies for professional development should promote collegial learning. Collegial learning can be supported by demonstrating examples that practicing music teachers have created and/or by training a few motivated teachers to be technology experts for their home school districts.

It is hoped that research like this, combined with studies showing how practicing music teachers are currently using technology (Hedden & Gordon, 1999; Reese & Rimington, 2000; Taylor & Deal, 1999), will help music education faculty make informed decisions regarding how to plan for technology as part of the undergraduate curriculum.

Limitations

This study was limited to freshman music students at Big 10 universities that are located in the Midwest of the United States. While attempts

were made to design the study to create findings that can be generalized to similar populations, some care must be taken when comparing these findings to students from universities of other sizes, locations, and academic levels.

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The Internet as a Means of Assessing State and National Standards

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The purpose of this session was to provide educators with practical methods of both traditional and performance-based assessment using the Internet. This assessment web site, entitled www.MusicAssessment.com, provides music educators with an opportunity to submit student work for each of New Jersey's six standards, including performances, compositions, essays and visual images, and have the work assessed based on the performance benchmarks published by MENC to score the national standards in music.

The web site is part of a doctoral dissertation research project at Teachers College, Columbia University. The web site provides educators from New Jersey with an alternative assessment device to the traditional pencil and paper examinations currently being field tested. The web site has 18 activities for students to complete; six from each of the three grade levels

being tested. Each of the activities requires students to submit an example of their work in a visual, written, or musical representation. Although this web site deals with one specific set of state standards, it is easily transferable to the nine national standards.

It is the hope of this study to supply the music educators of New Jersey with an alternative and accurate means of assessing their music program. The purpose of this study however, is to examine whether the Internet is a viable assessment device for the New Jersey Core Curriculum Content Standards in Music.

Music educators will become members of the site, and will be able to log on at any time to submit student work. Teachers may choose one or more of the standards to be assessed at any given time. If the teacher would like to see how their students perform on the critiquing standard, then that would be the only standard they would submit. If they would like their students to complete the entire assessment at once, they may choose to do so. Teachers and students will also be able to look at and listen to examples of representative works that correspond to each level of the grading rubric.

Feedback on the submitted student work will be returned within a short period of time, thereby eliminating the need for music educators to wait for a given date to assess their students or to wonder how their students fared. The feedback will not only be based on the grading rubrics, but will also include personal comments with suggestions for improvement and praise for a job well done. The session addressed the points presented in the following outline.

Standards Assessment: Traditional vs. Performance-Based

1. What are the advantages and disadvantages of each?
2. Which assessment type more accurately reflects a student's understanding in music?
3. What does the assessment for some of the State Standards in Music look like?
4. What are the positive and negative aspects of each?
5. What will the results of the assessment mean for our music programs?
6. What role can technology play in assessment?
7. What are the advantages and disadvantages of each?
8. How can the Internet be used as an assessment device?

Background on Research Project

1. The researcher's background as a member of the State of New Jersey Assessment Team.
2. Problems that the Assessment Team were faced with and how they were resolved.
3. Problems with the current assessment device being field tested by the state.

4. The researcher's previous work concerning the development of a comprehensive technology curriculum based on the National Standards and its relationship to the current project.
5. Rationale behind using the Internet as an assessment device.

Explanation/Demonstration of www.MusicAssessment.com

1. Background on the mechanics of creating the site.
2. Overview of the site, its features and functions.
3. Presentation and explanation of some of the activities contained on the site, at least one from each of the three grade levels.
4. Examples of submitted student work.
5. Discussion of the grading rubric and the feedback aspect of the site.
6. Discussion of preliminary research findings regarding the reaction to using the Internet as an assessment device including teacher and student responses to questionnaires.
7. Participants participate in some of the student activities.

Conclusion

The presentation closed with a discussion of and reactions to both the concept of Internet assessment in the music classroom, and the feasibility of using it at the state and national levels. Participants also discussed aspects of http://www.MusicAssessment.com.

Addressing Music Standards with Technology: A New MENC "Strategies for Teaching" Book

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Kimberly Walls, Auburn University
Kimberly McCord, Western Connecticut State University

Music lesson plans addressing the National Standards for Music were solicited from MENC members to compile a volume of selected lesson ideas for the Strategies for Teaching Series. More than 150 lesson plans were submitted. The local presenter showed PowerPoint slide shows prepared by each of the presenters as they narrated their slides live via Internet videoconferencing. The local and the distant presenters (one located in Illinois and one located in Canada) presented selected strategies associated with each content standard. Each presenter also highlighted lesson ideas for each of the nine content standard areas. Following is a transcript of the session.

Background

In this presentation, we would like to describe the MENC's new "Strategies for Teaching" book for technology and make you aware of some of the types of teaching strategies that it will include. Also, we would like to use

information from this process to generalize about the current status of technology.

During her term as MENC president, June Hinckley established an MENC Technology Task Force to make recommendations about MENC's role in helping teachers use technology. This task force identified 10 action items, with the number one action being to focus on applying technology to the music classroom with exemplars, models, and lesson plans. Accordingly, Kim McCord, Kim Walls, and I were appointed to serve as co-editors for a new technology book in the MENC "Strategies for Teaching" series.

The purpose of the book is to provide teachers with practical teaching strategies for using computer, networking, and music technologies to achieve the National Standards. The book will provide "real-world" approaches to integrating technology and help reduce the complexities surrounding the use of technology. We have avoided a technocentric orientation and place technology in its proper role of being a means to achieving important music learning purposes.

We solicited the submission of technology strategies by mailing a request to 323 teachers and through ads in *MEJ* and *Teaching Music*. In addition to hands-on student uses of technology, we sought teacher uses of technology for preparing teaching materials and for leading classroom activities in which the teacher is the user of the computer rather than students. We were very pleased to receive 160 strategies from 53 different teachers within the four months following the solicitation. I am pleased to say that four of these teachers are at the conference: A sincere thank you to all of them.

Strategies for grades 5-8 dominate the submitted plans. General music was the specialty area most often addressed. Composing, reading, and listening were the standards most commonly addressed. The least frequently addressed strategy was singing. There were:

Grade 5. Only 8 choral strategies
Grade 6. 92 general strategies, with 64 of these being grades 5-8, and 28 being K-4
Grade 7. 23 instrumental strategies, with 20 being grades 5-8
Grade 8. 37 "Special" strategies for grades 9 - 12, including music theory, music technology, and keyboard classes.

We can make a generalization we about what is happening with technology in our programs. It is clear that grades 5 - 8 dominated the submissions with the large majority being in general music and most common uses being composing, reading and listening. So it seems that middle school general music may be the most likely place where technology is in active use in our programs.

We selected and edited the strategies and wrote some ourselves, ending with an initial set of 102 strategies. We organized these into General Music, Performing Ensembles, and Theory, Music Technology and Keyboard with appropriate grade level divisions. The book also includes an introduction

and a list of suggested resources. At this point we will describe selected strategies for each content standard.

Standard 2: Performing

5-8 General Music Contributed by Arcari: Students will compose an eight-measure melody using notation software and be able to perform it on barred MIDI instruments.

9-12 Special Contributed by James Frankel: The students will play parts read from a score in a group keyboard/synthesizer class.

9-12 Performing Ensembles Contributed by Bill Bauer: The student will accurately sing/play the notated exercises.

Standard 3: Improvising

K-4 General Music Contributed by Laura Ferguson: Students will use scat singing to improvise over a Band-in-a-Box arrangement of a known classroom song.

K-4 General Music Contributed by Margaret Fitzgerald: Students will improvise answers to teacher calls over C Jam Blues accompanied by a Band-in-a-Box arrangement.

5-8 General Music Contributed by David Snyder: Students will improvise pentatonic melodies over two different accompaniment patterns of differing styles.

5-8 Performing Ensembles Contributed by Jason Meltzer: Students improvise melodic responses to "concert band" style rhythms in a major key over a Band-in-a-Box arrangement.

9-12 Special Contributed by Todd Beaney: Students will improvise and notate one harmonizing horn part (clarinet or trombone sound) and one rhythm section (chords or bass) part in the New Orleans jazz style.

9-12 Performing Ensembles Contributed by Valerie Peters: Students will practice improvising solos over chord changes they have typed into Band-in-a-Box for pieces they are studying in jazz band, combo or choir.

Standard 6: Listening, Analyzing, & Describing

K-4 General Music Contributed by Naomi Mellendorf: Students will identify same, similar, and different phrases aurally and visually by changing the color of phrases in a notation file.

5-8 General Music Contributed by Paulson: Students will reflect on Duke Ellington's use of tonal color in his compositions after exploring a web site.

9-12 Special Contributed by Dennis Mauricio: Students will compare, contrast and describe the major rhythmic, accompaniment and instrumentation elements within different styles of music generated by Band-in-a-Box.

Standard 1: Singing

Grades K-4 General Music Contributed by Kim Walls: Students will sing a familiar song in a round accompanied by a MIDI sequence.

Grades 5-8 Chorus Contributed by Brian Kabat: Students will sing their part of a two- or three-part choral composition as a notation file plays the accompaniment.

Grades 9-12 Chorus Contributed by Stephan Barnicle: Students in the choir will sing a varied repertoire of solo vocal literature for each other using SmartMusic and practice peer assessment techniques, evaluating each performance.

Standard 8: Interdisciplinary

Grades K-4 Contributed by Patricia Bissell: General Music Students compose introductory and background music using electronic keyboards, write an accompanying story, and dramatize the story, which is recorded to videotape.

Grades 5-8 General Music/Technology Contributed by Anna Larsen: Students use page layout software to create CD liner notes that explain student compositions created during a previous unit of study.

Grades 5-8 Orchestra Contributed by Polly Sibert: Students will combine reading, writing, and instrumental performance skills to create and perform a story using an electric violin and synthesizer.

Standard 9 History & Culture

Grades K-4 General Music Contributed by Naomi Mellendorf: Students will use Making More Music to compose and discuss multi-layered rhythm complex based on West African musical styles.

Grades 5-8 General Music Contributed by Debra Gordon: Students in two geographically different classrooms will collaborate to conduct and present research projects regarding composers and their music via videoconferencing.

Grades 9-12 Band Contributed by Bill Bauer: Students will conduct research through the Web to develop a portfolio of materials related to John Philip Sousa, the era of the Sousa Band, and the march genre.

Standard 4: Composing

Gr. 5-8 General Music Contributed by Naomi Mellendorf: Determine chords for a pre-recorded melody, then create new melody for those chords in Band-in-a-Box.

Gr. 5-8 Performing Ensemble Contributed by Heike Petith: Rearrange simple instrumental trio for new instruments, using correct pitches and ranges, in notation software.

Standard 5: Reading & Writing Music

Gr. K-4 General Music Contributed by Janice Lancaster: Correctly notate pitches for a song by ear, then notate original ending.

Gr. 9-12 Performing Ensemble Contributed by James Frankel: Sight read selected portions of their part of Hallelujah Chorus, along with other parts played by notation software.

Standard 7: Evaluating Music

Gr. 9-12 Theory, Music Technology Contributed by Kirk Kassner: Evaluate their own and other's compositions by comparing to an exemplary student composition.

Dreamweaver Course Builder: Simplifying the Development of Online Music Instruction and Courses

Carl Hancock
Florida State University

This session demonstrated a recently released tool that allows music educators to harness the power of a professional web-site design program. The application simplifies the development of interactive online courses, tests, and lessons. Courses developed can supplement a school district's curriculum offerings without taking additional class time from the instructor(s). Course content is delivered using standard web formats allowing students to participate by simply opening a web-browser on a computer anywhere. Participants are encouraged to interact with sample lessons developed using the program that demonstrates some of the possibilities of the software.

Resources

1. **Macromedia** - designers of Dreamweaver and other graphic web based delivery tools http://www.macromedia.com
2. **Macromedia 30 day demos** - http://www.macromedia.com/software/dreamweaver/trial/ http://www.macromedia.com/software/coursebuilder/trial/
3. **Presentation templates** - http://tmi.cob.fsu.edu/-carl

Experiential Examples

4. **Notation Station** - very well designed page, interactive Windows only http://www.notationstation.net/prev/default.asp9.page=teacher
5. **Mr. Notes Gameland** - http://www.talentz.com MusicEducationwesources/MrNote/MrNoteGameland/MrNoteGameland.mv
6. **Fun Brain** - lessons for K-8 non-music, great interactive design! http://funbrain.com/
7. **Ear Training Site** - Early non-java based instruction and testing on line. http://www.good-ear.com/servlet/EarTrainer?chap=l&menu=2

Lecture Format Examples

9. **What to Listen for in Music** - notes and audio of 20 minute lectures. http://town.hall.org/cgi-bin/nph-channel/Archives/radio/Kennedy/Broyles/index.html?x=147&y=10
10. **Trouble with treble** - more graphics-oriented http://www.tldsb.on.ca/schools/huntsvilleps/99Aessons/music/index.htm

Lecture format

11. **Blackboard Internet Solutions for Education** http://www.blackboard.com

Great jump off point to compare web site design and interfaces

12. **Allegro site** http://www.talentz.com/cgi-bin/miva?MusicEd/Allegro.mv+showcat+intrctlsn http://www.tldsb.on.ca/schools/huntsvilleps/99/lessons/music/index.htm

Texts for the development of online interactive lessons

13. *Clear Concise Short Order Macromedia DreamWeaver 3* by Steven Moniz. Published in 2000 by Hayden Books. This is a quick access to more powerful Dreamweaver features, explained step-by-step.
14. *QuickTime Pro for Macintosh and Windows* by Judith Stern and Robert Leffieri. Published in 1999 by Peachpit Press. This is a great reference for how to use all of the features of QuickTime Pro, including reference charts for frequently used features.

Using MIDI
(Musical Instrument Digital Interface)

Eitaro Kawaguchi
Florida State University

Hardware aspects of the MIDI (Musical Instrument Digital Interface) were discussed. Included in the presentation were (a) what kind of devices may be connected, (b) what the actual connectors look like, and (c) what is necessary to equip computers with MIDI connectivity. Also demonstrated was the difference in the sound quality between FM synthesis and wavetable synthesis.

MIDI is a standard for:
- Transmitting musical events (MIDI protocol)
- Storing musical performance (standard MIDI file)
- Hardware specifications for connecting electronic musical instruments and computers

MIDI connectors/cables include:
- Standard MIDI connector, cable
- PC - sound card connector, MIDI adapter
- MAC - serial port MIDI adapter, USB (Universal Serial Bus) MIDI adapter

FM vs. wavetable synthesizer - sound comparison
- FM - simple, elegant synthesis, but not as good as wavetable synthesis in producing realistic instrument sounds
- Wavetable - produces realistic instrument sounds

Resources

MIDI Manufacturers Association http://ww.midi.org

- A unique MIDI keyboard controller that connects directly to sound card's MIDI port
- QuickShot MIDI COMPOSER http://www.quickshot.com/midi_keyboards/composer.html
- MIDI Adaptor cable for Sound Blaster MIDI port
  You can get it ($19) at Christian Computer Concepts http://www.christiancomputer.com/midihdwr.htm

Parallel/Serial Port MIDI Adaptors for PC

- Opcode "MIDI Translator PC" http://www.opcode.com/products/miditrans_pc/
- MIDIMan "Portman" http://www.midiman.com/midiman/html/products/portman.htm
- Mark O' Unicorn "MIDIFlyer" http://www.lentine.com/ek/items/45957.stm

MiniMacman MIDI Interface for MAC (serial port)

You can get it ($34) at M Hardware by Maker - MIDI Classics http://midi-classics.com/hardm.htm

A USB MIDI interface for new Macs and PCs

- MIDI MAN http://www.midiman.net/newpmn.html
  You can get it ($99)at Doctor Audio - Midi & Digital Audio - Interfaces and Hardware http://www.doctoraudio.com/catalog4.html
- Roland UM-2 http://www.allusb.com/products/Pl0777.html
- Opcode MIDIPort32 http://www.allusb.com/products/Pl0777.html
- MIDIMan MIDISport 4x4 http://www.midiman.com/midiman.htm

Computer hardware online shopping aids

Finding LOW prices on the Intemet

- CNET Shopper.com Where to buy online http://www.shopper.com
- PriceWatch http://www.pricewatch.com
  Checking to see how (un)popular a vendor is
- Evaluations of Mail-Order Internet Computer Products Sales Companies http://www.resellerratings.com

Melodies from Cyberspace: Practicing with MIDI Accompaniments Downloaded from the Internet

Fred Kersten

The Pennsylvania State University

The objective of this presentation was to illustrate how MIDI accompaniments may be developed, placed upon the Internet, and accessed to provide harmonic background for practice and performance. MIDI (Musical Instrument Digital Interface) is a code developed and agreed upon by manufacturers that provides a means for music equipment, computers, and software to exchange information, and control signals.

Telemann Sonatas and other compositions were sequenced utilizing Studio Vision Pro 4 sequencing software, placed on the Internet in Standard MIDI format, and accessed at National Symposium for Music Instruction Technology via computer. The accompaniments were downloaded in real time and converted to audio output. The presenter illustrated their usage by performing solo parts on the recorder to the Internet-accessed computer-file backgrounds.

Musical accompaniments can be developed utilizing MIDI files because the files may be effectively uploaded, transmitted, and downloaded to any location in the world. Because of their small size they provide an excellent resource for practice and performance utilizing the computer sound card as a practice medium.

Musicians may code their musical compositions and disseminate their music to colleagues and others who wish to practice and perform without having to obtain musicians to play the needed harmonic backgrounds. Musical scores may also be downloaded and printed out when sheet music is not available.

The presentation resources are available at http://www.personal.psu.edu/users/f/g/fgk1/exib.html

Perspectives on Distance Learning in Higher Education: A Comparison of the Fiberoptics System and Video Conferencing

Debra G. Gordon
University of Northern Iowa

Distance learning has been widely embraced in Iowa for several years. In the early 1990s the state government appropriated millions of dollars to be used specifically for the implementation of the fiberoptics system, designated as the Iowa Communications Network (ICN). Currently there are over 700 sites connected: colleges and universities, public and private schools, hospitals, government offices, courthouses, and branches of the service. The network continues to expand.

While the ICN is widely used for a variety of purposes, the majority of those transmissions are related to teaching and learning. In addition, video conferencing remains another form of distance learning, employed in business, government, and education.

Distance learning of both varieties is readily utilized in the educational arena at the University of Northern Iowa (UNI) because the School of Music as well as other departments on campus recognize its potential and impact. Distance learning (a) provides formal and informal forums for learning; (b) facilitates interactive instruction to a number of sites simultaneously; (c) offers varied learning experiences to students of all ages; (d) provides a

model of instruction for future and practicing educators; and (e) enables more students to learn, particularly practicing educators who are teaching in rural and remote areas.

The machinations of distance learning require a variety of hardware and software. For the ICN, each site is typically equipped with several cameras which focus on the teacher, student, the computer, and the overhead; several monitors and microphones; a sound system; a fax and fiberphone; and two computers, one for the teacher to operate to view all sites during each class and one for PowerPoint, Internet, and e-mail use. For video conferencing, each site requires one computer, a software program to accommodate the transmission, Internet access through the phone lines, a projector for each receiving site to enlarge the teacher's image, and speakers and microphones.

In terms of comparing these forms of distance learning, the quality of transmission and the added capabilities of the extra equipment are superior for the ICN. Video conferencing, however, requires far less equipment, is more readily available, and offers access to virtually any person with a computer.

At UNI we have utilized the ICN and video conferencing for a multitude of transmissions since 1993. The Masters of Music program offers ten courses via the ICN. Additionally, both graduate and undergraduate classes have participated in transmissions with Arizona State University, Northwestern University, Indiana University-Purdue University at Indianapolis, and the University of Western Australia, with music classes at UNI's Price Laboratory School, and with the Governor's Conference to demonstrate teaching via the ICN.

Over a period of seven years, the data gleaned from distance learning at UNI has provided both positive and negative aspects. Advantages are (a) the teacher can deliver lessons without physical presence limited to one classroom, (b) the systems are cost effective, (c) learning opportunities are virtually limitless in terms of experts around the world, (d) the learners have added accessibility to coursework and presentations, (e) pedagogy is modeled via the distance learning approaches, and (f) consistency in learning schedules can be achieved.

The disadvantages of distance learning include (a) audio and/or video delay; (b) possible severance of connections; (c) the limitation of the teacher's gestures, physical teaching space, and language delivery, particularly for video conferencing; (d) the increased potential for learner inattentiveness can increase; (e) equipment requirements can be prohibitive; and (f) the teacher has a limited scope of the class, especially during video conferencing.

Successful teaching and learning require a variety of modifications from lesson delivery in the typical classroom. Extra time is necessary to plan, prepare, rehearse with the system, and deliver the lesson. The organization of paperwork must be accomplished well in advance so that manuals, papers, syllabi, assignments, and exams can be mailed to the students. And

clothing choices are critical to avoid the students experiencing "vision sickness."

In conclusion, the technology of distance learning is learned through observation and active participation by the students who then can implement it in their classrooms. Distance learning extends the instructional power of the teacher and the learning potential for the student.

Smart Practicing: The Effects of an Artificially Intelligent Computer Software Program on Student Achievement in Musical Performance

Susan Glenn, University of Georgia
Lisa Lombardo, Mercer University

Time, scheduling conflicts, and financial resources are often limitations to soloists and their accompanists in rehearsing together enough to effect a well-prepared performance. Students typically do the majority of their performance preparation by practicing without accompaniment, which is not within the same context in which they will perform. Therefore, these musicians are often under-rehearsed as an ensemble at performance time. While practicing alone is beneficial and necessary, it is a decontextualized approach to learning. Artificially intelligent computer technology enables the computer to emulate human accompanists. Such technology offers musicians the opportunity to experience individual practice sessions and lessons with their instructors in a more situated context.

The inclusion of contextualized situated learning environments in educational curricula is supported by researchers such as the Cognition and Technology Group at Vanderbilt. Studies on the uses and effects of practicing with an intelligent accompaniment computer program indicate an increase in motivation and musicality. The purpose of this presentation was to demonstrate the *SmartMusic* computer program and to discuss the effects of practicing with *SmartMusic* on the quality of performances of college-level, oboe, bassoon, and clarinet students.

A Quick Look at Sibelius Notation Software

Larry Marchese
Sibelius Software

In this presentation, participants joined in exploring Sibelius and learned how it can save time when creating music, worksheets, tests, and so forth. The participants also examined how anything created in Sibelius may be instantly placed on a web site. Lastly, some ways Sibelius is used in the K-12 classroom were discussed.