Integrating Music Technology into the Classroom\textsuperscript{1}
Part I: Where Are We Going, and What Do We Do Now?


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Technology offers the classroom music teacher many new opportunities in support of music learning and music creativity. This two-part series will explore future technologies, review curriculum standards, tools, and software available now, and, in Part II, examine resources available to help you with the challenges and planning necessary for effective technology integration.

Where Are We Going?

Embracing Change

To answer the question of “where are we going?” we need to first consider how we cope with one of the key forces that influence how we deal with technology, change. With all of the time constraints imposed on teachers, it is understandable that we feel most comfortable continuing to use the same materials and strategies we’ve already prepared.

A healthy “change exercise” is to look at your past and reflect on how you arrived at the present. For a novel experience, start by examining your own baby photo and stand it next to a current photo. You will no doubt be awed, as I was, by observing the creative power of your personal change, much of which we had little control over. Now, do the same with the teaching tools you first used as a child in school and compare those with what you now have at your disposal. Think about your first music technology experiences, including computing hardware and software. Consider that the musical instruments we take for granted were at one time “new technology.” The pianoforte is a case in point when it was first introduced in 18\textsuperscript{th} century.

The futurist, Alan Kay, observed, “technology is only that which wasn’t around when you were born.” For the children and students we work with—at least in developed countries—the Internet, CD music, video games, electronic music instruments, and MP3 music files are NOT technology. Our students have very different attitudes and views of “technology” than we do.

These thoughts reinforce two traits of change: change is a personal experience, and change takes place whether we chose to ignore it, run away from it, or embrace it. Change happens! The discussion that follows should help prepare you to embrace changes in music technology, and selectively use it to expand your teaching repertoire.
Figure 1. (a) A 1970s vintage Putney analog hardware synthesizer and (b) an analog synth, mixer, and more all created entirely in software with Reason (Propellerhead Software) on a laptop. A dramatic change over 30 years!

Music Futures

Let us review a list of “music futures” to see what new technology has the potential of dramatically changing the music classroom:

- Smaller and faster devices
- Wireless and mobile computing
- Digitization of media
- Changing music distribution

Computer and electronic devices keeping getting smaller, more ubiquitous, and at the same time, more powerful in terms of processing speed and memory. The dramatic increase in the power of a computer laptop is one example; digital music players is another. My personal Apple iPod has 15 gigabytes of storage and 2705 music files which will play for 9.1 days non-stop. I have all the Beethoven symphonies, the Bach unaccompanied cello suites, every Bela Fleck album commercially available, all the Frederick Fennell wind recordings, all of the clarinet standard repertoire, five complete audio books, and more. This is but one example of the incredible computing power in small, easily portable form that will be offered to the music teacher.
This leads to the second music future: *mobility and wireless connectivity*. Laptops are becoming the desktop of choice. You can set up your laptop with your software, instructional materials, and Web tools and bookmarks and take it with you everywhere. Take it into the classroom to work with your students, to the library or teachers’ work room, to home, and, with a pair of microphones, to the auditorium for recording a music concert. With advancements in WiFi (the wireless used for Internet access) and Bluetooth (an improved, short-range wireless to replace infrared controllers), we can expect our laptops to communicate wirelessly with MIDI music devices, digital cameras, printers, and video projectors.

If you haven’t noticed lately, *all media is turning into digital bits*. Digital cameras, digital music players and music files, digital movies on DVD and over the Internet, are but a few examples. As Douglas Adams wrote in the novel, *Mostly Harmless* (1992), a computer becomes “an interface where the mind and body can connect with the universe and move bits of it about.” What could be more exciting for a music teacher: the opportunity for our students, at any level of musical expertise, to be able to creatively manipulate universes of digital sonic events.
Music creation is moving to software, obviating the need for expensive sound and recording hardware. A laptop computer can now become a complete recording studio with just the installation of a software package. Software synthesizers (software “synths”) offer up the production of any sound imaginable including the older analog synth sounds of the Moogs, DX-7s, and others. With inexpensive MIDI input devices, just about any motion can be converted and captured as electronic musical gestures.

All of these “music futures” are moving us to change how music is distributed. Once music files are converted to digital form and compressed in formats like MP3 or AAC they can easily be exchanged over the Internet or by “burning” (recording) them onto CD or DVD discs. A dramatic change is taking place with a move away from music albums to the purchase of individual digital tracks over the Internet. Garage bands and “indie” music labels find this a new and exciting way to “get discovered.” Music projects like MICNet at Northwestern University (collaboratory.nunet.net/micnet) and the Vermont Music Project (www.vtmidi.org) use this technology to globally share the music compositions of young children over the Internet. The potential is boundless.

Printed music is going through the same transformation in distribution. Musicians can browse, view, listen to scores on the Internet, purchase, download the music to their computers, and then print the scores and parts on their laser or inkjet printers.

What Do We Do Now?

With a grasp on the past and a peek at the future, what can you as a music teacher do now in your classroom? There are activities possible, even with limited resources. Here are a few guideposts to help you get started:

- Let pedagogy lead
- Be aware of possibilities
- Give students freedom to explore
- Build up your resources

Pedagogy must lead technology. It is important to find ways to make the technology work for you in creating new musical experiences for your students. The technology must fit comfortably into your own teaching style and strategies.

What good is a computer and software for music? I can suggest six activities that computers, unequivocally, do well in support of the music learning process:

1. Providing music drill and practice (e.g., Music Ace, Practica Musica, MiBAC Music Lessons)
2. Creating rich multimedia experiences (e.g., Living Jazz, Xplora, Dvorak New World Symphony, or any of the many music CD-ROM titles)
3. Providing new forms of musical performance and expression (e.g., MIDI instrument controllers and software like Live, Logic Education, or Reason)
4. Offering alternatives for instrumentation (e.g., using a MIDI wind controller for a saxophone player to fill in for a string or brass instrument)

5. Serving as an intelligent accompanist/arranger (e.g., Band-in-a-Box software or the smart-arranging capabilities in Finale and Sibelius)

6. Opening up music making at any level, regardless of the ability to read music or to play a musical instrument (e.g., Subotnick’s Making Music or Rock Rap’N Roll)

Figure 3. A view of the young-children’s creative software tool, Rock Rap’n Roll (Silver Burdett/Scott Foresman). Hundreds of pre-recorded sound samples and loops, in a variety of pop music styles, can creatively be mixed to produce and record a music composition. (File: dbw_p1_fig3.jpg)

*Be aware of the possibilities.* Find ways to keep in touch with what others are doing with music technology, what new software tools are available, and what technology your students are using at home. Be vigilant in staying in touch with technology and being aware of the possibilities—even if you don’t have the time, or see away to immediately make it work for you in your classroom.

*Don’t be afraid of giving your students the freedom to explore.* Otto Luening, in a lecture to celebrate the 40th anniversary of the landmark electronic music concert at Museum of Modern Art, made a point I will always remember. He stressed the importance of providing time in the curriculum for our students to experiment. Without such freedom, he emphasized, he and Ussachesky would never have done the groundbreaking work for the 1952 concert.

Provide music technology resources for your students, give them the time to experiment, and step back. Let them be the experts with computers and technology. What is your expertise in this mix? Be the guide-on-the-side providing the aesthetic eye, ear, and hand that they need to turn their technology experimentation into a *musical* experience.
Figure 4. Photo with Vladimir Ussachesky (left) and Otto Luening (right) showing flute and tape used in the 1952 MoMa concert in New York City. Luening’s “Low Speed” electronically transformed the sounds of the flute and recorded them on tape for performance at the concert. Photo from www.furious.com/perfect/ohm/columbiaprinceton.html.

*Start now building up your music technology.* There are three key documents produced by the National Association for Music Education (MENC) that I recommend all classroom music teachers use as a resource.

- The *MENC Opportunity to Learn (OTL) Standards* (MENC, 1994). This is a set of music standards developed as part a component of the national U.S. *Goals 2000: Educate America Act* (1994). There are nine OTL standards designed for children from pre-school to grade 12 (see www.menc.org/publication/books/otl.html):
  1. Singing alone or with others
  2. Performing on instruments alone or with others
  3. Improvisation
  4. Composing and arranging
  5. Recording and notating music
  6. Listening, analyzing, and describing
  7. Evaluating music and music performance
  8. Music in relations to the other arts
  9. Music in relation to history

- The MENC *OTL Standards for Music Technology* (MENC, 1999). This document provides information on curriculum, staffing, professional development,
materials/software, equipment, and facilities for implementing music technology from pre-school through grades 12. (See www.mENC.org/publication/books.techstan.htm)

- The MENC Strategies for Teaching: Technology edited by Reese, McCord, and Walls (MENC, 2001). Over 100 real-life experiences from classroom music teachers as to how they’ve used technology in creative ways for music teaching. The projects are keyed to the nine OTL standards and to grade levels, pre-12.

Homework Assignment

We’ve consider the traits of change, looked into the future to see new technologies, and provided guideposts for implementing technology in your music classroom. In Part II we will answer the question “How do we get there?” by providing an overview of the many resources available to help you with implementation.

Here is a homework assignment for you. Access the documents and resources noted in this issue and take time to review them. Chat with your teaching colleagues about how computers can be useful in instruction, the feasibility of the guideposts suggested for implementation, and their personal experiences using technology. Until next time…

Reference Note

1This article was based on a series of three workshop presentations entitled “Music Technology 2003: Where are we going, What do we do now, and How do we get there” and presented at the ECIS Hamburg Conference, November 2003. The author thanks Kent Walter, music teacher at the Aberdeen, Scotland, independent school for arranging for these presentations.