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MUSIC AND
TECHNOLOGY

The cover features a complex, layered graphic design. A large, white treble clef is the central focus, set against a background of various textures and patterns. To the right, there are several musical notes, including a quarter note and a half note, rendered in white. The background is a mix of dark and light gray tones, with some areas showing a grid-like pattern and others showing more organic, swirling shapes. The overall aesthetic is modern and artistic, reflecting the journal's focus on music and technology.

Music Technology as a Servant to Real Music Experience

BY PETER R. WEBSTER

At a recent music education meeting in the Chicago area, I had the pleasure of talking with a number of elementary general music teachers about curriculum. Most were certified Orff teachers or used many Orff principles in their teaching. When I explained that my research at the university often involved creative thinking in music with children, it began a lively exchange about what imaginative thinking is in music and how best to encourage it in our teaching. We talked about the importance of student-centered learning and the power that comes from having children construct their knowledge by experimenting with sounds, both playing and singing. We also all agreed that the teacher is the key to knowing when to allow this kind of exploration and when to teach knowledge and skills more directly, so that the children have something credible with which to be creative. All the teachers around the table valued composition and improvisation, and we had great fun talking about the challenges and the many rewards that come from placing an emphasis on these areas in making music happen with kids.

However, when I started talking about how excited I was with some of the latest advances in music technology that support this approach—especially some of the free and very inexpensive software that is readily available—the conversation became far less animated. In fact, things seemed to grind to a halt. My sense was that many of the teachers all used computers in their personal and professional work administratively, but few had chosen to actually engage such technology in their teaching with children. One person, commented that "... kids have enough of this at home and other places. I have

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so little time with them. I want music to happen, not computers."

I was stunned. But later, after thinking about this, I realized that I shouldn't be. Time is precious in teaching and making music *should* be the focus of what teachers do. My passion for technology in the classroom needs to be tempered with the realization that music experience and sound should be the focus. Perhaps there are ways to use technology to genuinely support the music experience.

GROUND RULES

Let's begin with some assumptions.

- ① First and foremost, music time with children in school should be about making or learning about music. This means that music performance with instruments, singing, listening, and moving to music, and perhaps some group work in composition and improvisation are central and will occupy most of the instructional time.
- ② Teaching music to children is a blend of teacher-directed content and child-centered exploration. Research has shown that kids often learn best when they work on projects, either singularly or jointly

with their classmates—especially in settings where the teacher has established clear boundaries and the tasks are understood by the children.

- ③ Technology is not the point. Music is the point. However, wise use of technology can enhance musical understanding in service to the first two bullet points above. For example, if the teaching goal is to experience how a changing music texture (e.g., from monophonic to more polyphonic and complex textures) can effect the felt experience of the music, teacher-directed performance of a piece of music that is built this way can occupy the majority, if not all, of instructional time. However, having children work with a simple music sequencing program or online music notation program to create something similar makes sense as a powerful extension, especially if they can do this outside of the required music instructional time.
- ④ Most children are very comfortable with using computers and software to make things or using the Internet to help find the answers to problems. For those of us over forty years of age, we remember how comfortable we might have been experimenting with reel-to-reel tape—splicing, and recording sound pieces. Perhaps, too, you will remember how our teachers might have learned how to do this from our energy and encouragement. Children today do not understand a world without YouTube, iPods, Internet, and instant access to media of many kinds. Our use of these resources as partners to what we believe is perhaps vital in reaching the children of today. We have a professional obligation to understand

Criteria for Software Selection

OVERALL INSTRUCTIONAL DESIGN

- Program objectives are clear and suitable for target audience.
- Program content evidences and reinforces good musicianship.
- Prerequisites for program use are reasonable and required tutorial information is provided.
- The range of content and difficulty levels are sufficient to provide scope.
- User can control the presentation rate, sequence, and overall content (if appropriate).
- Program is designed to intelligently and sensitively respond to user responses (if appropriate).
- Feedback or other approaches to interaction seem appropriate and well designed.
- Concern for different learning styles is evident.
- Transfer or combination of music concepts is encouraged.
- Instructor management features provided for customizing, record keeping, and the like.
- Standards: instructional content fits within the national, state, or regional music standards in terms of the intended audience, the music skills reinforced, and the age group served.

INTERFACE AND TECHNICAL DESIGN

- Screens are well-balanced and free of unnecessary clutter and text.
- Text is free of spelling and grammatical errors and is appropriate for age level.
- Menus, menu items, and dialog boxes are logical and consistent with expectations.
- Method of input is clear and uncomplicated, avoiding unnecessary typing or mouse gestures.
- Appropriate use is made of graphics and text to supplement music experience.
- Variety of sound sources are offered and these sources are of the highest music quality.
- Required response is musical or consistent with music experience.
- User feels in control of the interface (knows how to leave the program or move elsewhere).
- Program is designed so that incorrect or unexpected responses will not "crash" the computer.
- Program executes quickly with no awkward time delays.
- Setup of hardware for sound and MIDI options is easy to implement.

DOCUMENTATION AND SUPPORT (ELECTRONIC OR PAPER)

- Manual has clear instructions for installation, including list of minimum hardware requirements.
- Manual contains an explanation of program features, options, and overall use.
- Program has online help.
- Publisher provides information on licensing and product support in case of problems. Publisher provides notification of upgrade.

these technologies—their strengths and limitations for learning.

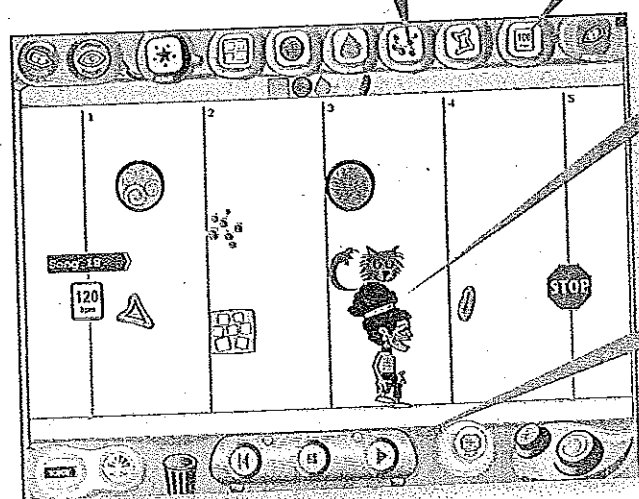
- Our strategies in using computers and music software in schools is not too different from our use of Orff instruments or a CD player or iPod. These material objects are not what defines us as music teachers and musicians. Our children understand this because, at the end of the day, it is not the objects that last; it is the resulting experience that is the focus of our teaching that lasts—or at least should.

SIX WAYS TO USE MUSIC TECHNOLOGY WITHOUT THREATENING MUSIC CLASS TIME

Here are specific ways to consider using music technology while spending most or all of your time with your standard music curriculum. Examples below include some of the software titles that I have seen teachers use very effectively in and outside of class. All of the software runs on both Macintosh and Windows operating systems unless otherwise indicated. You do not need a fancy music keyboard to use any of these titles unless you want to. All of the titles are either free or are about \$50 or less, and discounts are always possible for quantity purchases. For more information on these titles and others (see www.teachmusictech.com/music_software_list.html).

Projects outside of music class. Most schools have learning centers that have computers. Math, science, English, and other subject-area teachers use resources in these centers routinely to support their teaching. Why not music? Consider a program like Harmonic Vision's *Music Ace Maestro* or Sibelius' *Groovy Music* series. Each program is designed to teach music fundamentals while providing creative ways to write music. Imagine working with your students in class on topics like dotted rhythms or syncopation and then assigning an out-of-class exercise using this software in the media center. Each program can be easily purchased by parents, too, for continued work at home. I especially like each of these programs because music skills are ac-

Groovy Music Compose Panel

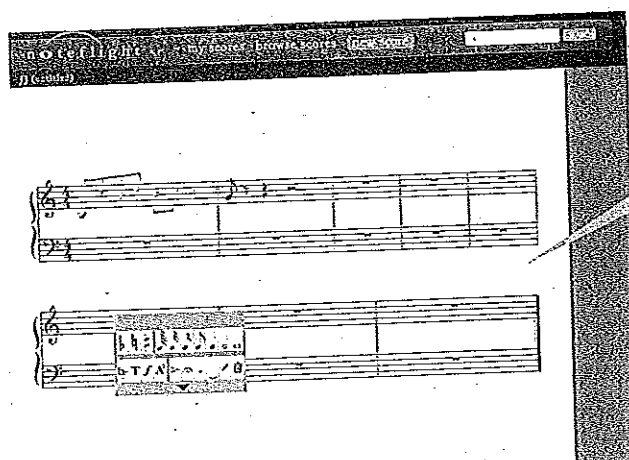


Interface uses pre-set sounds

Shapes represent elements of music like rhythm, melody and chords.

Character walks across the screen showing the progress of the music, playing the sounds as they pass.

Play back the piece, edit it or see the elements displayed as musical notation.



NoteFlight

Displays, edits, prints and plays back music notation in any standard web browser. Users can create scores, choose to share them with others, or publish them to an online database.

accompanied by a chance for children to make their own compositions that show that they understand the music concepts being taught!

Online assignments for homework. Most students have access to the Internet outside of class time, either at home, at a public library, or in a media center. How about a simple music notation assignment using the free, online application called *NoteFlight* (http://www.noteflight.com/info/learn_more/)? If one of your teaching objectives is learning traditional music notation, *NoteFlight* might be a perfect way to have your students create some music of their own or notate music of others without taking valuable time away from class. Other outstanding places for online music teaching support is the New

York Philharmonic's KidsZone (www.nyphilkids.org/main.phtml) or the Dallas Symphony's DSOKids (www.dsokids.com/2001/rooms/DSO_Intro.html). Children can work in teams to satisfy a number of innovative assignments that support your class work.

By the way, while you are online exploring resources for your students, check out the support pages at the Kennedy Center's ArtsEdge (<http://artsedge.kennedy-center.org/>). This is a wonderful collection of links and ideas for you and your students. There is so much online now that can be used in important ways to support what you do in the classroom.

After-school composition or improvisation clubs. Saturday morning garage bands occur frequently in

today's high school student culture. In preparation for this, how about some opportunities for children in elementary school to learn to think in sound with composition and improvisation experiences in after-school settings? Consider starting a composition club one day per week that meets in the learning center and works with Apple's *GarageBand* (Mac) or Sony's *ACID MusicStudio* (Windows). Each program has recording capabilities, built-in loops of previously created music, and ways to play music into the program from attached music keyboards. This might require some teacher-time to organize, but it would not take long for students to gain confidence in working on their music on their own both in and outside of school. There may be a parent with music knowledge who could also serve as a teacher's aid to help extend your curriculum.

PG Music's *Band-in-a-Box* provides wonderful opportunities for children to use the computer as a kind of backup band while they improvise on either a classroom instrument or an attached music keyboard. Choose a standard song and put in the chord changes. The software provides accompaniment based on the chord changes in many musical styles. Flexibility for tempo and key choices make the program very flexible, and students can play along and improvise a bit as they get more comfortable with the music. Improvisations can be recorded and presented to the whole class at an appropriate time. All of this can be done in an after-school setting or introduced into the classroom or ensemble at times that make sense.

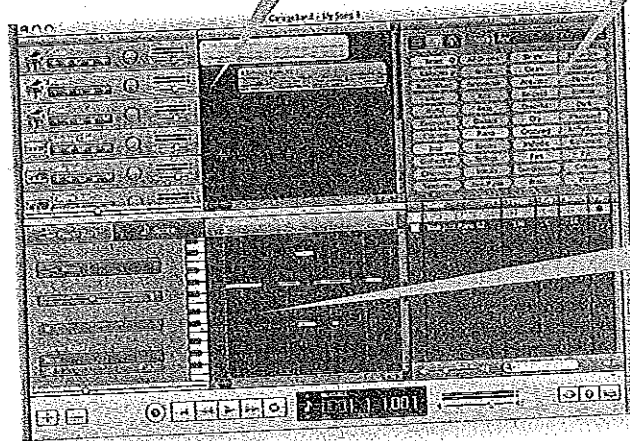
Using technology yourself as a teaching tool. It is so thrilling when we use teaching aids in such a way that they melt into the background and are ignored, with the real experience of the content rising to the surface. When teaching about melody and harmony or possibly form, instead of drawing graphic notation on the board, think about using a computer with a program like Morton Subotnick's *Making Music* or *Making More Music*. You can use a portion of *Making Music* online (<http://www.creatingmusic.com/>) interactively

in the classroom or order CDs for the more complete programs. Subotnick offers other interesting and very musical programs online as well, including *Hearing Music* and *Playing Music*. These programs let you draw musical gestures to demonstrate how music is constructed and allow much flexibility in teaching about timbre, key, scales, augmentation, and inversion. In these cases, you are devoting class time to teaching music and simply using the technology to do what you normally do better. The technology floats to the background and simply is a means to better music teaching.

Music learning centers. Another way to integrate technology into your classroom in powerful ways without interfering greatly with your curriculum is to consider establishing a small music learning center in a corner of your room that can be visited by children on a rotating basis. A music listening program like *Sibelius Instruments* that explores the instruments of the orchestra and band might be a nice program to include in the center. It features many audio clips of both instruments singly and in the context of real musical examples drawn from the standard repertoire. While you are teaching the large class, students can take turns visiting the learning center in your room to work with this or other programs that you might choose to install. Again, children can work in teams with a single computer.

Recording concerts. Kids love to be technologists. Remember the days of the AV Club? How about using the advances in music recording technology by having a team of kids record a public concert or school assembly. Set up a computer with a quality microphone attached (or maybe more than one microphone), and use the *Audacity* software to record and then edit a concert performance. Have the students become the sound engineers, and use the software to help teach digital audio editing and post processing sound effects. Use Apple's *iTunes* to create a CD for parents or post the music on the school's Web site. All of this needs a bit of teacher help, of course, but you will be amazed at how quickly your

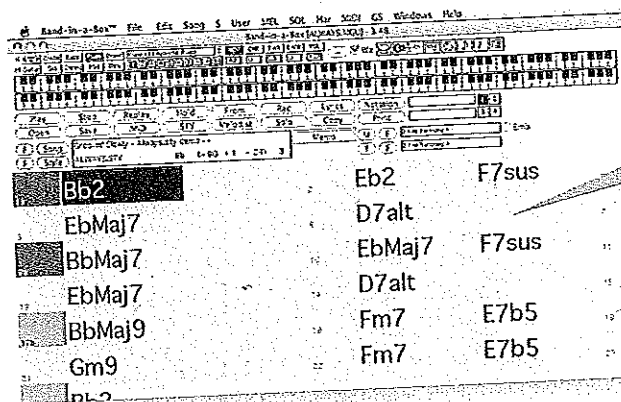
Garage Band



Add instrument tracks from a list and record from an attached peripheral keyboard.

Import built-in loops of previously created music in a variety of styles.

Music can be mixed to enhance timing and tuning. Add some basic effects such as compression, reverb, or EQ. Fun effects such as track echo, chorus, and automatic filter are available.



Band in a Box

Type in the chords to any song, pick a musical style, and click the Play button. Band-in-a-Box then generates a full backing arrangement of piano, bass, drums, guitar, and strings.

students will gain the requisite skills on their own to do this and how eager they will be to teach others what they know. This would be a great project, too, for a student teacher to help guide, since most music education preparatory programs today have music technology expectations for new teachers.

WHAT TO DO NEXT

As I think about my conversation with the Chicago teachers, I should have described to them some of the possibilities above. The most important thing to remember is that good music technology experiences start with a strong philosophy of music teaching. Music itself is the focus, and the technology simply supports it. Success comes from matching your teaching with what appeals to you. Summer is a great time to explore the Internet, take a class at a local college, or visit a local music store. Try some of this software on your own and think creatively about

how to match it to your teaching strategies in ways that make sense.

In the sidebars that accompany this article, I have included a chart of criteria that might guide you in selecting software.

One final point: Using computers and software in instruction is not trouble-free, and at times there are frustrations. But I can promise you that the technology has never been more stable and the rewards that can come from pairing some of the best software with your fine music teaching can be enormous for your students. ■



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