

Technology in Music Teacher Education: An Evolving Philosophy

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*"Once considered an esoteric, highly-specialized component of musical instruction and practice, technology is now an integral tool in all aspects of the musician's work, be it composing, concert performing, teaching, recording, using the Internet, researching, or managing a concert series. In addition to traditional uses of computers, students must be given the opportunity to study contemporary music technology for exploration of both the artistic and scientific aspects of music. Modern musicians need to be able to work with sound within the electro-acoustic/computer music environment (sequencing/composing/signal processing), notate and publish music with computer software, record in both analog and digital formats, and teach through distance media. As well, they need to utilize, both as learner and teacher, the many computer programs that enhance instruction. Including technology as an essential tool in **all** aspects of our programs, not as a frill but as an integral part, is the best way to achieve these skills."*

In 1994 I helped draft this broad declaration for Brandon University's School of Music five-year strategic plan. To fulfill the goals of this statement, in October 1996, I submitted a proposal for a Manitoba Governmental Post-Secondary Education Incentive Fund grant for one-time funding (\$74,000) for laptop computers and software to be utilized by music education students in their training. Announcement of the award came in February 1997. The previous year, the School of Music had received another Education Post-Secondary Incentive Fund award of \$82,000 to establish a computer music workstation laboratory. The laboratory is operational and supporting all programs in the School.

The aim of the 1997/98 project was to provide laptop computers with music software and MS Office 97 for all students (N=24) in years two through four of a five-year concurrent music education program. In preparation for the project, I visited and studied other university programs that had adopted the "Laptop U" idea: Acadia U (Canada), Wake Forest U, U of Minnesota-Crookston, Valley City U (ND) and Mayville State U (ND). The school hired a full-time support (help desk) person for the year to instruct faculty and students in software usage and provide maintenance for the computers. Students paid a \$600 lease fee for the year. At year's end, a questionnaire was used to assess student reaction. Student opinion generally moved from mildly negative at the beginning of the project to very positive at the end. A report based upon questionnaire results and my observations of student teaching is a resource for the project's continuation and is available upon request.

One exciting aspect of the 1997/98 laptop project was requiring student teachers (N=9) to go into the field equipped with laptop computers to assist their field work. I supervised all music student teaching that year. Routine activities in the student teaching portion of the project involved 1) e-mail communication with me as supervisor (daily journal entries, lesson/rehearsal plans due as they were presented, and student-teacher interaction reports), 2) planning onsite visits, and 3) weekly NetMeeting conferencing. Students were required to utilize Band-In-A-Box, Musicator, Access 97 for student record keeping, and PowerPoint lessons in class.

The laptop student teaching exercise afforded me insight into the practical advantages of regular e-mail

contact with students, paperless delivery, and electronic chats as instructional method. One reward was a marked increase in my awareness of students' field experience work compared to the traditional bi-weekly visit, though I still visited the schools bi-weekly. There were no surprises when I saw the students in person. I was surprised at the end, however, by the students' enthusiasm for chat meetings, their candidness (a good thing!) in electronic responses, the increase in students' personal role in their learning, and the students' creative in-class use of software in their lessons. Software usage was not prescribed. Rather, student teachers were expected to develop strategies that would allow greater depth and accuracy of what they were teaching. They were also expected to assess that accuracy and depth. Because of the project's success, we have made the technological requirements in music field experience permanent.

Another reward resulting from the laptop project was reflection on a broader question: "In the long term, will technology genuinely improve education, or will it become a fad in an educational establishment too often called 'trend- happy'?" The voice of educational technology criticism is strong ... and for good reason. The predicted impact on education of television in the classroom in the 1960's, microforms in the 1970's, and the more recently forecasted marriage of the Internet and telephone never happened. Suspicion of technology and disenchantment are common. Some pundits, for example, consider distance education the deathblow to the university and education in general. Yet only the severely unenlightened can fail to recognize technology's current and increasing influence on education, at all levels.

My belief is that educators who recognize technology as a powerful teaching and learning tool should—in addition to focusing on immediate, practical applications—search for answers to several large, philosophical questions. I ardently believe, for example, that music sequencing is a practical application for initiating young students into musical composition and creativity. Students can work with the elements of music—timbre, rhythm, form—without thorough training in music rudiments, and this is in fact a potent way ... albeit untraditional ... to learn the rudiments of music. But if sequencing is treated as an add-on to the curriculum rather than an integral part, or a high-tech means to engage students, I suspect that it will be relegated by history to the heap of spent educational fads. The larger issues for the teacher advocate of sequencing are: 1) establishing the role of composition/creativity in the curriculum (if it is truly an important one), 2) considering how sequencing can directly and conveniently aid the creative process, and 3) deliberating software and hardware issues ... in that order.

Reflecting on the deeper questions of how computers facilitate learning and teaching encourages redefinition of the way we teach and learn. With that in mind, the remainder of this paper describes briefly four broad issues that have occurred to me as a result of the music laptop project and my work in technology-enhanced music education.

The quality of teaching and learning stands to be strengthened by technology.

I ask the students in laptop student teaching to articulate almost daily how their computers can be used to improve their teaching and the learning of their students. As an exercise, I assess, with the student teacher, how technology increases students' depth of knowledge and ways of knowing. For example, I recently watched an elementary student figuring out how a map works (the concept of abstraction). He understood that the map represented the city, province, and region where he lived, but he really got the idea when we juxtaposed the regional map with a real life view of the same region via a live photo from an Environment Canada satellite. This is "depth in learning" that comes easily with technology. It is a step beyond what is possible without it.

For another example, I contend that stylistic insight should be cultivated in the music classroom and

rehearsal hall, and I convey this expectation to my student teachers. I have watched some of them—without prompting—discuss musical styles with their classes by taking a song the group had learned, then listening to, discussing, and singing the piece in different styles, as selected from Band-In-A-Box software. Developing elementary stylistic insight can occur in many ways, but not as conveniently and immediately as with software designed for that purpose. There are other instances in laptop student teaching where I believe quality of instruction and learning are improved by technology. However, I am also sensitive to the possibility that technology can become the *focus* of instruction or an unwarranted add-on, and I am quick to point this out. I fear technology becoming a distraction, and my aim is to keep quality teaching and learning foremost in the student teachers' minds ... not the technology that supports it.

Technology helps the teacher address differing learning styles.

Often, we consider the problems of struggling students, at all levels, the result of social influence, lack of motivation, behavioral problems, or simply a shortage of talent. Risking the charge of idealism, I ask my student interns and educational methods pupils to consider all their students bright and talented and to be aware that learning problems often arise because teachers fail to discover the right learning styles for individuals. This is no small task. Despite current multiple intelligence theories and tests such as the Meyers-Briggs Type Indicator that identify learner type and different ways of knowing, I am unaware of research that suggests instructional method to accommodate learning style inconsistency in classroom and rehearsal settings. I contend that the computer—and its capacity to individualize instruction—offers promise. Of course, the questions of universal accessibility to computers and finding time in the busy academic calendar to individualize learning always arise, but these problems are not insurmountable.

The teacher should somehow discern why students are struggling and develop a course of action to allow different approaches. I do not suggest abandonment of ensemble rehearsals and traditional classroom teaching; however, within these conventional structures, a wider range of activities such as Comprehensive Musicianship activities can create alternative learning opportunities ... and this is where the computer comes in. Ear training, theory, historical and musical context research, composition, and musical analysis related to the music or musical topic are areas where computerized individual assistance can effectively help students learn in their own way. Students know when they are successful, and computers can help them discover the path to achievement. The teacher's job is to provide multiple paths.

At least in higher education, the computer seems to be breaking the monolithic, linear, "one-style-for-all" typical of the lecture hall (professor lectures—student reads the book). An innovative teacher is still the key to good learning, but many universities recognize that the lecture is not the sole means of discovery, and they rely increasingly on technology to accommodate learning. One example of an alternative to linear learning is Internet hypertext links to encourage students, at all educational levels, to choose their own comprehensive learning direction and pace. A topic such as integration of the arts into society is a prime subject for hyperlink technology. A course web page linking historical fact, aesthetic thinking at the time, social issues, and a comparison of the arts at the time gives the student a wide-ranging, non-linear view of the topic and helps the student to engage content in their own way.

Distance education can enhance learning.

In the laptop student teaching project, I know more about the students' progress and activities than if I were observing in person every few days. Frequent electronic reporting and instantaneous feedback keeps field experience objectives in their minds much more than conventional student teaching practice. The students report this fact in their journals and, having supervised conventional student teaching for many years, I note

a marked increase in student awareness of how they are progressing toward agreed upon goals. The virtual community that develops is a powerful learning device, and students enjoy discovering one another's successes and problems through the chat session discussions.

Student teaching seems an ideal forum for distance technology; however, delivery of conventional university courses can also be enhanced. Interestingly, distance delivery allows reconsideration of the place of the small university/college along side the large institution. The playing field is leveled in distance education. Campus location or isolation, life style, and library and research resources are less of an issue with the distance option. "Degree mill" fears are voiced regularly, and perhaps for good reason. However, the public must recognize that course and degree quality can vary just as much with on-campus courses as distance equivalents. I predict that distance delivery will lose its glitzy, shallow standing, and that good courses and programs will be recognized ... no matter how they are delivered. Higher education is being profoundly affected by distance delivery.

Technology can liberate the learner.

Teaching methods, attitudes, and expectations have changed during the 28 years I have been teaching, and I say the change is for the better. I have witnessed the fading of the image of a student's mind as an empty vessel into which the teacher pours knowledge to a brighter picture where interactivity, student responsibility in learning, and independence are hallmarks. Especially at the university level, students learn more from each other than from their teachers and administrators. This is not to take away from the inspirational, motivating mentor-teacher. When successful teachers are asked to name the greatest factor in their education, most indicate a teacher who provided encouragement. However, students need opportunities to exchange ideas with one another as well as with the teacher ... and the classroom is not always the best forum. In my university days, the coffee shop served this purpose after the final class of the day. Today, the coffee shop is still a forum, but there are also Internet chat rooms and threaded discussions which are in some ways better. I note that students simply speak more freely and equitably in the virtual community. One of the most successful aspects of the laptop student teaching project is the weekly chat ... with and without the instructor. And when I can provoke an in-class debate that I think will carry on beyond the classroom, I feel like a successful teacher.

Student independence and electronic discussions risk abuse ... and there is plenty. The abundance of electronic information and the vast opportunities to use it can lead to complacency in education. But I choose to teach with technology because it helps me personalize instruction and extend it beyond the classroom walls. My responsibility as a teacher is to help my students find their learning style, engage subjects in different ways, and manage the vast body of knowledge which is their right to experience. Technology helps.

In closing, I offer a few conclusions:

Technology can enrich the quality of teaching and learning; however, innovative, inspirational teaching is the key—as it has always been—to successful learning, with or without the use of technology.

- Distribution lists are the secret of life!
- In the acceptance of technology as a learning tool, teachers must lead by example.
- Technology is not a cure-all for educational problems. As a matter of fact, I suspect it stands to make a bad teacher worse ... and a bad student worse too. Technology can be a distraction.
- By their nature, the present generation of students is ready for learning technology. "*Maybe we're just more, you know, advanced.*" (Eighteen-year-old Daniel Wells, who answers technical-support calls for

Nintendo of America, explaining his generation's facility with high-tech equipment) (Newsweek, January 11, 1999)

- Technology allows alternatives to universal curriculum models and perhaps the opportunity to reconsider them.
- "Instructional technology has been integrated into the curriculum at many colleges and universities creating new interactive learning environments. It is heralded by many as a panacea for educational ills and a vital component of the post secondary curriculum, but critiqued by others as simply an "add-on" or a subverter of the traditional values of the core curriculum. Regardless of the political and ideological divide among some faculty and administrators on this issue, instructional technology now plays an inevitable role in educating students at the post-secondary level" (Instructional Technology Conference 1996 brochure, State University of New York at New Paltz)