

MUSIC TECHNOLOGY AS A TEAM SPORT

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The history of music technology education is traced from the 1950's to the present with a view toward understanding the nonmusical paradigm usually found in schools today. Positive experiences using an ensemble approach to the introduction of music technology leads to a reconsideration of the "cloistered monk approach." Implications for the growth of music technology within music education foretell a possible break with the past.

Looking in All the Right Places . . .

In looking at music education I did not find a desirable paradigm for my music technology class in the composition monastery, the A/V cubicle, the class piano room or the computer lab. I found it in choir. I like to sing. I especially like how most people just throw themselves into singing. When you see someone singing you can tell they are busy, their minds and bodies working together to make sound that combines with everyone else. This "togetherness" stems directly from early American singing schools. I do the same thing with MIDI. I have all the controllers (keyboard, string, wind or percussion) connected in a chain so that the MIDI input from a performer is combined with the next one, a process called MIDI merging or MIDI mixing. This allows me to use one sound source (a sound module or tone generator) for the entire group, and to "live" record (sequence) the whole ensemble with a single computer.

But I like to have everyone sing first, combining their voices with everyone else. It is a choral class at first. Then everyone plays the same music, using a choral sound. Of course, it is an instrumental ensemble, but each person can play any sound. After the singing and the playing comes the looking. Using a computer projector, the piano roll display from the sequencer is studied. This can be an exciting moment for students who have never seen their own performance on a sequencer display. Incorrect notes can be changed to the correct notes, timings adjusted, "flubbed" notes removed, sounds (timbres) changed and intensities (dynamics) corrected. "Listen to the corrections as they scroll by. Now that you know how it should sound, let's play it that way. Download this rehearsal sequence later and practice it. Make your own changes and bring them in to show the class." If this sounds like a good idea, you might be wondering why music technology is not usually done this way.

How Did We Get Here?

The use of music technology is not very old. Many of the earliest musical experiments with technology involved teams. Their activities occurred

in the last fifty years, and that is not very old. Consider Pierre Schaeffer and Pierre Henry (musique concrète in the 1950s), Herb Deutsch and Robert Moog (Moog synthesizer, 1960s), or David Rossum and Scott Wedge (E-mu, 1970s). These pioneers found comfort in their teamwork as they blazed the trails we pursue today.

Many musicians play with groups, but with the right music technology one musician can sound like an orchestra. This heroic image reminds one of Beethoven—the genius who triumphed against many odds. That image is about 200 years old, still young compared to the entire history of music. Contrast Beethoven’s image with a group of musicians playing on a hillside centuries ago. Musicians played alone back then as well, but probably not as cultural icons. There was a gentleness and companionship, a humanity on that hillside that often is missing in current music technology. Some people would say that it is diminishing within music education. The contemporary “sturm und drang” in music technology has a history that exerts influence over technology integration in music education. I will discuss background conditions leading to this situation and further discuss implications for the future of music technology in education.

From Whence We Came . . .

E-Monks

There is a secretive sect of music composers that originated in the late 1950s. These individuals worked alone at universities using public domain software. Some of these composers were good musicians, but some had no friends, could not play a musical instrument, could not carry a tune or dance. A few of them wrote bad music and played it for each other. This “computer music culture” dominated the administration of music technology education until the dawn of the MIDI era, and it still does at some schools. Members of this culture may take a dim view of my generalization, but for those of us who include Stockhausen with Blondie and Thomas Dolby, we view their hegemony as misguided. For more information about the roots of computer music see <http://mypage.iu.edu/~jnoxon/midinote.htm>.

Hackers

The MIDI era was ushered in with the personal computer era. The earliest days of personal computers coined new terms (hacker, nerd, etc.) for anyone who could get his or her computer working successfully. These people were a breed apart from others, and were solitary individuals who often muttered disparaging “techno-babble” while performing magic with technology. They enjoyed using their computers for the enjoyment of seeing them work, such as setting up a MIDI system. These individuals still are with us—especially at smaller schools—and are hidden in audio visual storerooms behind walls of post-it notes. Their familiarity with technology, combined with their own social reticence, lends them a particular viewpoint—one that fits in well with old Beethoven.

Pioneers

The pioneers of music technology in education were self styled individualists. These were the few men and women who braved the pitfalls of reading manuals cover-to-cover and tracing down the one bad cable from among two dozen. Where you found music technology in classrooms you found an inspired teacher with dirty slacks from kneeling down to check connections. The typical early-adopter of MIDI often had a spare bedroom full of MIDI equipment connected to a computer. With no support, they simply patterned what they did at home. It was only natural that they applied this paradigm to their work at school. Self-teaching became the first tradition of music technology pedagogy, one that can be improved.

The personal computer itself came with a territorial *modus operandi*. One could get a lot done with a PC, but not if one had to share it with someone else! Modern computer networks with server storage make resource sharing easy; but nevertheless, everyone wants their own computer. You build up your own personal network on a computer and it reflects your personal sense of organization. If you see your needs as best provided for by a highly centralized system (a system with yourself at the center, perhaps?) then your vision for educational systems might just reflect that. Personally, I have had more success with a vision that is democratic, like a circle of hands on an ancient hillside.

We Ran the Race . . .

As an instructional tool in music education, music technology is just not very old. First there were the E-Monks with their dusty tube computers, then the hackers and their Apple IIs, the piano teacher with a keyboard lab, and now the campus IT (Internet Technology) folks with endless Microsoft Office machines. Think way back to early chemistry education: "The lead turns to gold through Alchemy." I am certain there were many systems of chemistry education that made sense, in terms of both the knowledge of the times and the possible remuneration available. Given enough time, developments often make current practices unsustainable. However, sometimes looking backward at progress seems Byzantine when compared to looking forward. "Yes—the uranium turns to plutonium by enrichment."

Examining the history that got us here helps explain the present. From the E-Monks came a sense of isolation by the transformation of music into a form of esoteric knowledge administered by experts. In the greater historical view, music is not generally a restrictive ritual. It has a place in ritual but finds many other places throughout common social activities. As the lair of the composition sorcerers it was a highly restricted activity, not an activity that anyone might enjoy. But anyone can enjoy music, not just the few. The cloistered aspect of the old electronic music tradition erected unnecessary barriers to the integration of technology in contemporary music education,

both by masquerading as a restricted activity and by carrying with it a sense of isolation.

From the E-Nerd came the solitary and mysterious high-tech work cubicle. To some of these E-Nerds, job security meant instilling a sense of fear in coworkers. A sense of unbearable complexity is often sufficient. To others the sense of "turf" was strong. In some schools the high-tech person was not up to the challenge of maintaining and operating a music lab because it requires a very special set of knowledge and skills. At larger schools, students often are hired to maintain the music lab, often with rapid turnover. One difficulty in supporting music technology activities in school music programs comes from the environment surrounding those usually entrusted with that support responsibility. The condition surrounding the only person between you (as a music teacher) and canceling MIDI class could be a powerful disincentive to teaching music technology. It is an uneasy situation, one that we tend to avoid. This mystification of music technology was partly brought about by a general lack of qualified support, rather than by un-called-for levels of system complexity.

From the intrepid pioneers comes the self-taught success story, a case study in ego. Reports from one successful teacher were helpful to the extent that you teach like they do. Chances are reasonably good that you teach differently, so the lesson from our pioneers will be inappropriate for you in some ways. Thus the folklore that gets passed on from these intrepid teachers is sometimes one of frustration: "So and so spent weeks getting the lab working but I didn't like using it." The good side is that we do have examples of success. The bad side is the assumption that their success translates into our success. It might, but we can also search for our own approach using their successes as our inspiration. I believe that most music teachers, when left alone, do not have the ability to teach themselves music technology to the extent necessary to build a school program. Since most programs are built in bootstrap mode this idea has severely limited technology integration in music education.

The latest trend in providing computer facilities for students is the business lab model. In this paradigm, standard omnibus computer labs are built that serve all purposes, but primarily they provide typical office applications. What are we to expect from our music students lined up in regimental fashion sitting at Microsoft workstations? "Students, please create some music now until 2:15 and then we'll do some standardized testing." There should be a gentler, more humanistic paradigm.

Taking Stock of our Current Situation

The didactic approach to education in music technology grows from thin historical soil. It lacks organic matter and a healthy ecosystem. You might think that music technology is old enough that it has been figured out by now. There are programs and certifications available of various kinds, so it has been figured out a few times already, but these represent our "Alchemy"

—our earliest understanding of music technology in education. These programs build logically upon the thin soil available, but as I have described they carry some historical influences that are self-defeating.

Music technology has not restricted social music activities, it has emancipated them somewhat. When the E-Monks relied upon mainframe computer time for their compositions there was competition for scarce resources. Desktop computers now have more power than the old mainframes did and the resources are no longer scarce. Millions of musicians are using music technology every day: in schools, in recording sessions, and in popular dance clubs, not alone in musty studios. The academic computer music culture was pushed aside and now appears as a curious footnote. Technology in music education should better reflect its place in our culture.

Music technology is not mysterious to the millions of people buying it, for it gives them the new possibilities they clamor for. If there is a problem with too many features on a music product, this reflects problems in the evolution of the user interface or the marketing. Every activity has a set of possible interruptions: the broken guitar string, the frog-in-the-throat during a lecture, or power outages. I think everyone has experienced car trouble, yet most continue to use cars. Often it seems that nontechnical individuals hold technology to a higher standard of performance; technical problems are more acceptable when they can be attributed to human error. Why would anyone expect music technology to be more trouble-free than anything else? There is a problem of folklore—war stories from those without adequate support. Technology in music education needs to build a healthy ecosystem of support.

The support primarily available has been our intrepid pioneers. In some cases teachers have been able to adapt to the pedagogy of others, and this support has been sufficient. Sometimes novices would strike out independently and quickly escape the comfortable realm of knowledge held by the pioneer. The technology evolves rapidly and some MIDI labs have been or will be decommissioned after only a few years of use. Many of our first generation pioneers have or will retire soon, and some of those who remain have failed to update either their skills or their labs. We should look to their efforts as our first steps and not necessarily as models for our own pedagogy.

Technopoly is a word coined by Neil Postman. This is an agenda of sorts, one possible direction for the progress of our culture, and it is an agenda that technology itself puts forward, for the progress of its own monopoly. The computer is using us. It is time *we* decide what the lessons will be from incorporating technology in music education. I am suggesting that the lessons can closely mirror the music on an ancient hillside rather than the “cloistered monk paradigm.” We will still need qualified technical support, but it is music teachers who should decide what the music technology class is, and it could be a lot more like choir, band or orchestra. Working alone with a computer has already claimed a large portion of a student’s waking hours, and will continue to provide necessary opportunities for learning.

Still, we can model traditional music behavior while teaching music technology without further enforcing Technopoly.

The future of technology in music education is up to us, but now we can see how the forces at work have a little history behind them. If we really want to teach on that ancient hillside rather than in the computer lab, we have traditions to overcome. If music technology programs are to incorporate an ensemble approach, we must be willing to leave our fifty-year tradition aside. Remember that it is possible to keep the knowledge domain the same when choosing the ensemble approach. There really is nothing within our brief tradition that requires a cloistered approach. Today it can be seen as historical artifact, and the future may render it as musical alchemy.