

**Computer-Aided Instruction
in Music Education:
Friend or Foe?**

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Computer-Aided Instruction in Music Education: Friend or Foe?

While our society continues to progress and advance as the decades past, there is an essential part of our culture that has remained fairly stable. Music. In any culture, music seems to be a basis for exploration, emotion, worship, communication, and leisure. Recently, however, music has continuously been changing because of technological advances. These technological advances, however, are recent and are becoming topics of debate among current music educators and pedagogists. The purpose of this paper is to present their viewpoints and to discuss the controversy surrounding the use of technology in music education.

“The growing availability of computers...carries a profound significance for altering the role of music in our society.¹” This idea, so concisely stated by Mr. Hoffmann, outlines the plane on which the growing debate about computer-aided instruction in music education resides. The two parties that comprise this debate have two very different answers to this statement. The group which advocates computer aided instruction in music education, who for the purpose of this paper will be called moderates, believe that technology has its place in the music curriculum, and when used correctly, will have a positive influence on the role of music in our society and on music in general. Their viewpoint stems from the belief that as society advances the music curriculum must advance with it. “Music, a potent social instrument from earliest times, operates not merely in imitation of society but in dynamic interaction with it.¹” Thus, the moderates feel that “the most stable aspect of life in the twenty-first century will be that of change²,” and that music must change with the society that it directly interacts with. And finally that “the need for change in education is crucial not only in understanding technology, but also in the application and resulting process of instruction³.” The moderates cite the following examples and objectives to support their position:

1. The number of computers, as well as electronic instruments such as keyboards and media hardware such as VCRs and CD players, found in American homes has risen dramatically within the past decade and music educators *must* take advantage of this.

¹ Hoffmann, James A. “Computer-Aided Collaborative Music Instruction” Harvard Educational Review; v61 n3 p270-78 Aug. 1991

² Moore, Brian “Future Technology Working For Education” Music Educators Journal; v79 n3 p31-33, 67 Nov. 1992

³ Moore, Brian “Future Technology Working For Education” Music Educators Journal; v79 n3 p31-33, 67 Nov. 1992

2. Accordingly, the amount of music software available for *at home use* has provided the learner with a powerful musical environment which allows them to experience music at a very high level of thinking, and all for a fraction of the price this software would have cost just ten years ago.

3. It is now commonplace for school districts to have administrators whose sole responsibility is that of coordinating the use of computers and technology by providing both curricular direction and resource assistance to teachers.

4. Accordingly, it is also common for computer corporations and music companies to have divisions whose responsibility is that of education.

5. “The accessibility provided by computers has the power to restore music-making to its vital function in society, once again opening its profound resources to everyone.”⁴

6. Finally, and most importantly, the moderates feel that “for many students, the traditional approach to learning music – especially the need to learn musical notation and musical theory – has been both intimidating and stifling to natural creativity⁵” and through the use of technology in the music classroom this no longer has to be the case.

The availability of computers to learners in the late 1990’s and twenty-first century is far more vast than it was in decades before. According to PC Magazine computers had penetrated nearly half of American homes as of 1997, and it is speculated now that almost 65% of American households own a computer. “Children’s educational use and Internet access were shown to be the strong drivers of intent to purchase.”⁶ The computer industry has capitalized on this massive spread of computers into the household by offering many types of software available for *at home use*. Of these kinds of software, music software of all kinds is now available. In 1978 when the home computer was invented and the boom began, Computer-Based Music Instruction (CBMI) pioneers were already experimenting with second-generation software, as their first generation software was created in 1968 on large mainframe computers. Just 10 years later in 1978 computer developers discovered the “eight-bit” computer technology. This technology made the home PC possible because it lowered the cost of the computers and made them smaller. With the invention of this lower cost machine, many college campuses yearned to acquire these new machines, and with the help of music administrators, musicians and music educators could now

⁴ Hoffmann, James A. “Computer-Aided Collaborative Music Instruction” Harvard Educational Review; v61 n3 p270-78 Aug. 1991

⁵ Ohler, Jason. “The Promise Of MIDI Technology: A Reflection on Musical Intelligence” Learning and Leading with Technology; v25 n6 p6-15 Mar. 1998

⁶ Rupley, Sebastian. “A PC In Every Home” PC Magazine Online Dec. 23, 1997.
<http://www.zdnet.com/pcmag/>

gain access to the CBMI programs. At this time, Soundchaser developed the extremely popular Musical Instrument Digital Interface (MIDI) technology. This technology shattered all of the previous boundaries of music software and now computer software developers began rapidly turning out third generation music software programs. More than 500 music software programs were developed beginning in 1978 that could be considered third generation software. As computers became more advanced, so did music software. And with this expanding musical technology, the learner could now acquire a powerful musical environment, which allowed them to experience music at a very high level of thinking, and all for a fraction of the price this software would have cost in 1978. Thus is the case now, as the rapidly expanding computer industry has created computers which are capable of running fourth-generation software that is over 1000 times faster and more complex than the original CBMI software. “The question raised by this is obvious,” Brian Moore writes. “How do we as professional music educators integrate such outside activities with our own school based programs?⁷” The moderates plan to promote computer-aided instruction in music education heavily. “Interaction between education and industry has benefits for both.⁸” The benefits for the technology industry are obvious – more computer-aided instruction in the music curriculum yields higher sales, bigger profits, and increased productivity. The debate, however, is focused around the usefulness of computer-aided instruction in the curriculum.

The rising computer industry, as stated before, has caused a huge PC boom in the household. And as previously stated, adults cite children’s education to be one of the main reasons a personal computer is purchased. The underlying fact, which has stimulated this burst in PC purchases, is that children have gained tremendous exposure to computers in the school curriculum, mainly for word processing and mathematics purposes. It is not uncommon for school districts to have administrators whose sole responsibility is that of coordinating the use of computers and technology by providing both curricular direction and resource assistance to teachers. And because these administrative positions have been created, software and computer companies now have whole divisions that are devoted to promoting education. The moderates again feel that this situation should be taken advantage of and computer aided instruction in music should follow along the same lines of computer aided instruction in other areas.

⁷ Moore, Brian “Future Technology Working For Education” Music Educators Journal; v79 n3 p31-33, 67 Nov. 1992

⁸ Moore, Brian “Future Technology Working For Education” Music Educators Journal; v79 n3 p31-33, 67 Nov. 1992

The moderate's feel that "the accessibility provided by computers has the power to restore music-making to its vital function in society, once again opening its profound resources to everyone."⁹ The practice of music has the potential, as it has always had, to balance some of the divisive forces in our society, and also to generate "restorative action" through participation. Social status is achieved by individuals through the act of performing, as well as intellectual and musical development. This individual musical development, however, can not reach beyond the boundaries of one's self, for it is inevitable that any musician will perform within a group setting at some point in their musical career; at which time the group will perform for an audience. Therefore, in order to successfully perform within this group setting, the individuals must regard each other with some measure of mutual respect and the audience must be receptive. Thus a bond is formed between members of a performing group and between performers and their audiences. Unfortunately, however, the leading music conservatories around the world have contributed to the "isolation of the musical processes,"¹⁰ because a conservatories main objective is to train performers. Thus, the setting in which the student performs most often is within a one-on-one student/teacher setting. In contrast, however, a smaller group of music composition students at the same conservatory perform rarely, and are separated from the conservatory mainstream. Therefore, within the conservatory we have "a microcosm of the relation of musicians to society where the primary evaluation/validation role is filled by the studio teacher of faculty jury"¹⁰, and not by an audience. The moderates seek to eliminate this gap with the use of computer-aided instruction. They believe that a music computer studio offers a way for performers, composers, and interested members of the public to *integrate*, rather than separate, musical activities. "At the conservatory level, performers who work in collaborative groups can develop an understanding of the craft of music composition and thereby acquire access to the creative function."¹⁰ The computer can easily play back a performer's composed music, allowing the group to criticize and revise the work before it is submitted for evaluation. On the flip side, the computers playback capability provides the student composer with an easy means of hearing his/her work. This function allows the composer to hear the "performability," if I may, of his/her work. Too often composers write music that is physically impossible for performers to play. This technology will help to eliminate that. Outside the conservatory, the access computers provide to musical activities can aid any interested person or group acquire the knowledge to become an independent

⁹ Hoffmann, James A. "Computer-Aided Collaborative Music Instruction" Harvard Educational Review; v61 n3 p270-78 Aug. 1991

¹⁰ Hoffmann, James A. "Computer-Aided Collaborative Music Instruction" Harvard Educational Review; v61 n3 p270-78 Aug. 1991

musical force. The MIDI technology that is used might be described as “‘assistive’ technology for the artistically challenged. It represents one more way in which technology can make the world of art more accessible to people who consider themselves outside its domain. The realm of music is no longer restricted to those who are traditionally trained.¹¹” The available technology “makes creating music a simpler process and can thus be used to attract more than just the musically gifted.¹¹” Thus the gap and divisive forces between musicians of all kinds and between musicians and society has been eliminated, and music has been returned to its vital role in society because its resources are open to all who seek to gain access to them.

Finally, and most importantly, the moderates feel that “for many students, the traditional approach to learning music – especially the need to learn musical notation and musical theory – has been both intimidating and stifling to natural creativity¹²,” and through the use of MIDI technology in the music classroom they feel this no longer has to be the case.

“Understanding and using standard (music) notation requires such a significant commitment in time and education that most people give up experimenting with music in their early lives. If they did not have formal music lessons or an informal discovery process...then the world of music creation would be largely closed to them.¹¹”

The moderate’s seek not to discourage individuals whose desire it is to be musically creative, but rather to encourage these people; and they cite that the traditionalist’s views and practices, such as creating exclusive music conservatories and societies, have long been excluding those who are less than prodigal. The moderate’s view the MIDI system to be the key player in making music exploration, creation, and knowledge available to anyone who wishes to acquire it. This point relates back to the objective discussed previously. Moderate’s view technology as the avenue to “restoring music-making to its vital function in society, once again opening its profound resources to everyone.¹³” They believe that the technology available should be taken advantage of in any way possible to further their goals and the goals of the music education process. Thus, they seek to integrate MIDI technology into the classroom. This technology strays from the traditional music composition and notation methods, in that instead of actual notes on a staff, the learner simply draws lines on the screen with the mouse pointer to indicate the direction of pitch. This method allows the learner to focus on the creative process rather than the tedious process of

¹¹ Nolan, Evonne, comp. “Creativity with Instant Feedback” Teaching Music; v2 n3 p36-37, 55 Dec. 1994

¹² Ohler, Jason. “The Promise Of MIDI Technology: A Reflection on Musical Intelligence” Learning and Leading with Technology; v25 n6 p6-15 Mar. 1998

¹³ Hoffmann, James A. “Computer-Aided Collaborative Music Instruction” Harvard Educational Review; v61 n3 p270-78 Aug. 1991

understanding the traditionalist's system of music theory. The moderate's don't completely disagree with the present music theory system, but argue that this MIDI technology can be used as a stepping-stone in achieving the musical knowledge that is needed to understand the traditionalist's music theory system. In recent years, MIDI technology has also been expanded upon and exported to other programs that don't deal specifically with a MIDI interface. Programs such as Finale and Sibelius, both music composition software, combine traditional music composing elements such as a 5 lined staff and notes, with MIDI playback technology. These programs are easily used by those who have already gained the basic music theory knowledge required to understand music composition. Programs such as APT (Absolute Pitch Trainer) and ET Drill, both pitch recognition training software, enable students to practice their pitch recognition skills in order to acquire the sought after skill of perfect pitch, or the ability to recognize and name *exact* notes and chords upon hearing them. These drill programs are intended to reinforce what concepts taught by the teacher in the classroom. The moderates view them as useful because "(their) time in the (computer) lab is free of pressure. No one sees students make mistakes, and they gradually improve their musical dictation skills through continuous practice. The computer adjusts to the students progress by giving them harder exercises as their score gets higher.¹⁴"

Finally, the MIDI software's playback capabilities are extremely important in all software that uses the MIDI system. Supporters of computer-aided instruction in music education argue that the use of computers allows for "creativity with instant feedback."¹⁵ During the creative process, students can continuously evaluate their work, no matter how large or small of a group the composition is being written for. Ed Harris, a retired music teacher in Billings, Montana, says, "what a computer does is make it possible for students to get instant feedback on their compositions. You can literally compose for a symphony orchestra without having to hire a symphony orchestra to hear how it sounds.' So the emphasis can be placed on the creation of music and on listening skills."¹⁶ Proponents of advancing computer-aided instruction in music education also argue that through the use of MIDI, students can break free from just "following the rules" rather than actually creating. For example, traditional music theory courses include assignments in which the students are instructed to create musical phrases which follow the "rules" outlined by the European masters such as Bach and Beethoven. Students then write a musical phrase in 4-part harmony following these rules. The students, however, often do not get

¹⁴ Anonymous. "Computer-Assisted Instruction in Music" Teaching Music; v1 n6 p34-35 Jun. 1994

¹⁵ Nolan, Evonne, comp. "Creativity with Instant Feedback" Teaching Music; v2 n3 p36-37, 55 Dec. 1994

¹⁶ Nolan, Evonne, comp. "Creativity with Instant Feedback" Teaching Music; v2 n3 p36-37, 55 Dec. 1994

to hear what they have created. They are just simply following the rules. Moderates argue that simply following the rules is contradictory to a main objective of music and music education, that objective being to increase musical creativity and aesthetic sensitivity. The traditional process “sterilizes” music, moderates argue. Moderates support this MIDI technology and the music composition programs that use it because they allow the young student composer “to hear the assignment in progress, instead of merely following ‘rules’ while having at best a vague impression of the resulting sound.¹⁷” In other words, the student can hear what he/she is writing and not only evaluate it based on whether or not he/she has followed the rules, but also on the basis of how it sounds!!!! Moderates stress the importance of beauty in *all* music whether its purpose is solely for a music theory assignment or whether it’s a masterpiece in progress. They believe that if music does not possess beauty than it cannot be music because music is inherently beautiful.

The traditionalists have a different opinion. They feel that:

1. “Computers are perhaps the most acute symptom of the rush to end childhood. The national drive to computerize schools, from kindergarten on up, emphasizes only one of many human capacities, one that naturally develops quite late - analytic, abstract thinking - and aims to jump start it prematurely.¹⁸” The traditionalists view this jumpstart as unhealthy.
2. Children need a wide variety of activities, including close, loving relationships with adults, outdoor activities, time for unstructured play, and exposure to many different types of arts.
3. MIDI technologies that moderates support contain unacceptable trade-offs and that the quality of music software on the market is below an acceptable standard.
4. Accordingly, traditionalists feel that computers and computer software are training children to become reactors instead of actors. In other words, computers are actually stifling the creative process.
5. Finally, and most importantly, traditionalists are against the increasing implementation of computer-aided instruction in music education, and warn that a computer *must not* play a more vital role in a young musician’s learning than the teacher.

“Love for each child, respect for the general developmental patterns of childhood, and a sensitive honoring of the unique gifts and developmental variations of each child provide the strongest scaffolding for healthy cognitive, emotional, and sensorimotor growth in childhood.

¹⁷ Hoffmann, James A. “Computer-Aided Collaborative Music Instruction” Harvard Educational Review; v61 n3 p270-78 Aug. 1991

¹⁸ Alliance For Childhood. “Fool’s Gold: A Critical Look At Computers in Childhood” Sept. 2000
<http://www.allianceforchildhood.org>

Children need adults who care about them and care for them, personally, in ways that are developmentally appropriate.^{18,}

Traditionalists feel that the educational implications of this truth are profound and stress that “at the very heart of any attempt to improve our schools and educate our children should be a recognition of children's prime needs for close, loving relationships with caring, responsible adults, and for developmentally-appropriate care.^{18,}” In other words, traditionalists feel that a child’s use of computers should begin when developmentally appropriate for that child, and warn against the dangers of premature brainwork. They believe that there is no less promising educational strategy for young children than emphasizing abstract thinking, fueled by powerful computers. Why?

“Because research findings across many scientific disciplines strongly suggests that later intellectual development is rooted in rich childhood experiences that combine healthy emotional relationships, physical engagement with the real world, and the exercise of imagination in self-generated play and in the arts. Intense use of computers can distract children and adults from these essential experiences.^{19,}”

Literacy, for example, is inspired and reinforced by interaction between child and adult, whether the adult is a parent or caregiver- first at home, later in school. The nonverbal exchanges between children and adults lay a vital foundation on which later literacy skills will develop. Traditionalists feel that putting a child in front of a computer at an early age will “undermine the development of critical skills that kids need to become successful.^{20,}” And, as parents and schools seem to be expanding computer availability to younger and younger students, traditionalists believe that these vital skills and foundations of creativity, whose values are immeasurable in music, will be jeopardized. They feel that,

“school policies often ignore the educational impact of suppressing this natural, kinesthetic mode of learning in young children. Instead, they impose the adult mode of seated, intellectually oriented approaches, such as Internet research. Some schools are even eliminating recess to provide more time to drill young students for standardized tests.^{21,}”

¹⁹ Healy, Jane M. Your Child's Growing Mind: A Guide to Learning & Brain Development from Birth to Adolescence Doubleday, August 1994.

²⁰ Kelly, Katy. “False Promise: Putting kids in front of PCs a great idea? Think again.” US News Online Cover Story; 9/25/00. <http://www.usnews.com/usnews/issue/000925/nycu/computers.htm>

²¹ Alliance For Childhood. “Fool’s Gold: A Critical Look At Computers in Childhood” Sept. 2000 <http://www.allianceforchildhood.org>

By putting young and budding musicians in front of the powerful music software that is available, traditionalists say that schools are interfering with the natural developmental process of the body and brain. They cite the evidence that the imaginative element of a child's physical interaction appears about the age of two and extends throughout their childhood. Therefore, through this play, children expand their imagination to acquire "the power to generate playfully one's *own* images and to transform them in the mind's eye, which scientists now theorize, later becomes the capacity to play with challenging mathematical, scientific, and cultural concepts in ways that create new insights."²² The key phrase in this statement is "one's *own* images." Traditionalists believe that computers stifle this ability because they provide the visual images for the young learner and therefore remove the imaginative element from learning. And, as quoted, this ability, when nurtured, allows a child to deal with challenging concepts later on in life. Traditionalists believe that computers should not be implemented into the music curriculum in the creative and developmental process of a child's life.

All children and adolescents need a wide variety of activities that a computer-centered education and lifestyle cannot provide. First of all, children need close, loving relationships with responsible adults, and in this case with musicians, composers, and teachers. The quality of an adolescent's emotional connections to parents, teachers, composers, and musicians is critical to every aspect of their development. While close contact with famous musicians and composers is not always possible, study of their works through aural and written analysis can forge a child's healthy attachment to such musicians. "For this reason, any proposed educational reform should be scrutinized for its impact on strengthening or weakening the bonds between the teacher, her students,"²² and the European masters. The most important emotional connection that a young musician can have is the connection with his/her teacher, and this vital topic will be discussed separately. Traditionalists feel that increasing the use of computers in the classroom forces young musicians away from the masters and thus deprives them of the necessary study of the great works. Such deprivation prohibits the student to construct the necessary foundation of music theory upon which all future learning will rest. They feel this way because the music software available is more drill oriented and does not illustrate to students *how* music theory is implemented into actual compositions. This topic will too be covered in detail. Secondly, traditionalists feel that bonds between young musicians and the natural world are important because,

²² Alliance For Childhood. "Fool's Gold: A Critical Look At Computers in Childhood" Sept. 2000
<http://www.allianceforchildhood.org>

“emotional bonds with the rest of the natural world help us to mature physically, intellectually, and spiritually. Nature's diversity nourishes our material needs, including food, clothing, medicines, even the air we breathe. But it also builds our emotional capacity for kinship, affection, awe, nurturing, and beauty; promotes our intellectual capacity for problem-solving, creativity, discovery, and control; and helps stimulate the recognition of a just and purposeful existence.²³”

The emotional needs that nature nourishes are required for aesthetic sensitivity, especially that of affection and beauty. Also, nature has acted as a source of inspiration for musicians and composers for centuries. Creating an attachment between children and computers removes them from the natural world and again deprives them of the emotional needs necessary to become not only successful musicians, but also successful people. Thirdly, traditionalists stress the importance of play - especially make-believe play – because it

“contributes in unique and critical ways to children's intellectual, social, and emotional development. In contrast, studies over the same time period have failed to demonstrate that computers in elementary education make any critical contribution to children's development. Yet playtime in many classrooms is being sacrificed, as computer time increases.²³”

This type of play is important not only to young children but to adults as well because it requires the individual involved to constantly challenge previous hypothesis and to revise ideas about space, time, probability, and cause-and-effect relationships. It has even been reported that “high-tech companies have begun to provide playrooms to try to maximize their employees' creativity²⁴.” On the contrary, however, many pre-schools and elementary schools, as well as high schools, are reducing and eliminating recess, playtime, and physical activities from their schedules in order to devote more of the student's time to computer-aided instruction. Only adults, it seems, have time to expand their minds through play. Finally, and very plainly, music students must engage and be exposed to other artistic activities such as poetry, painting, drama, and dance because all of the fine arts influence each other directly and often serve as inspiration to one another. Traditionalists feel that “children are born artists. They are naturally creative - eager to sing, dance, pound rhythmically on tabletops, act out great dramas from their own shared imaginations, and design masterpieces with sand, shells, stones, logs, clay, paint, crayons, or any other material that's handy.²⁵” Children must be allowed to physically experiment with these arts

²³ Alliance For Childhood. “Fool's Gold: A Critical Look At Computers in Childhood” Sept. 2000
<http://www.allianceforchildhood.org>

²⁴ Russakoff, Dale "Mind Games for Tech Success: You've Got to Play to Win," *The Washington Post*, May 8, 2000, p. A01.

²⁵ Alliance For Childhood. “Fool's Gold: A Critical Look At Computers in Childhood” Sept. 2000
<http://www.allianceforchildhood.org>

in their raw form, and traditionalists argue that student's increased exposure to computers is detracting them from their natural artistic exploration, as well as the elements previously discussed.

As moderates continually push for further implementation of MIDI technology into the music curriculum, traditionalists argue against the technology, saying that it contains unacceptable trade-offs. The traditionalists cite four particularly important trade-offs in the MIDI technology that they feel are unacceptable. (1) experimentation versus formal training, (2) real versus synthetic sounds, (3) performing versus composing, and (4) composing versus engineering. First, "even though MIDI offers many opportunities...it is no substitute for learning to play an instrument."²⁶ The traditionalists feel that experimentation should follow formal training. In other words, students should become fluent on one or more instrument first, and after learning the traditional technique and theory of the instruments, should then be allowed to experiment. Second, as advanced as MIDI technology is, the sounds it generates are no comparison to conventional instruments, and in some cases, traditionalists argue, don't even come close to that of the instrument it attempts to replicate. Students composing for conventional instruments "will often be surprised when sound produced for a high-tech instrument are translated to wood and brass."²⁶ The traditionalists view this in a negative light because the MIDI technology makes young students expect one sound when they receive another and are thus disappointed. They argue that students should understand the sounds of conventional instruments before reaching into the electronic domain. Third, traditionalists feel that students should develop the important musical skills learned in performance before they begin composing. The stress that, "it is within the context of a group that they (students) develop the ability to listen, react, and play along with others."²⁷ These skills are necessary in understanding music and they must be mastered before venturing into the composition domain. Fourth and finally, because MIDI technology allows users to do things they could not otherwise do, it will sometimes force them to focus on technology at the expense of music, "because they may spend what seems like an inordinate amount of time setting software parameters and twisting dials rather than playing and composing."²⁷ Traditionalists not only warn against this but despise this topics existence. They say that music should *never* take a backseat to technology, and the moment that it does is the

²⁶ Ohler, Jason. "The Promise Of MIDI Technology: A Reflection on Musical Intelligence" Learning and Leading with Technology; v25 n6 p6-15 Mar. 1998

²⁷ Ohler, Jason. "The Promise Of MIDI Technology: A Reflection on Musical Intelligence" Learning and Leading with Technology; v25 n6 p6-15 Mar. 1998

moment that the technology should be removed from the classroom. They also comment that there can be nothing more disappointing than a computer “system error” in the middle of a creative surge. The traditionalists cite all of the above trade-offs as completely unacceptable and say that MIDI technology should not be used in the classroom, or at least its use be suspended, until a solution is found for the trade-offs.

Traditionalists also argue that that computers and computer software are training children to become reactors instead of actors and that the quality of music teaching software on the market is below an acceptable standard. They feel this way because much of the educational software available is “drill and practice, thinly disguised as some sort of game.”²⁸ Because of this game-like system, students are taught to memorize rather than allowing them to explore the concept and fully understand it. Traditionalists argue that “a good program should be open-ended, encouraging children to be actors and not reactors,”²⁹ and advise avoiding programs that stoop to drilling- rote single-answer questions – dolled up with fancy graphics, bells, and buzzers. Unfortunately, most music education software, especially the titles intended for younger age groups, contain all of the elements that traditionalists warn against. They therefore, seek to eliminate the use of this software in the classroom, or at least suspend its usage, until new software that meets acceptable teaching standards is developed.

Finally, and most importantly, traditionalists are against the increasing implementation of computer-aided instruction in music education, and warn that a computer *must not* play a more vital role in a young musician’s learning than the teacher. As covered previously, human interaction fosters emotional, intellectual, and creative growth within the human mind. Who better than for young musicians to interact with than the individual with whom they spend most of their time? That individual happens to be the music teacher, and the bond between teacher, especially the music teacher, and student is the absolute most important aspect of music education, according to the traditionalists. Therefore, they feel that computers must not, and cannot replace the teacher in any way, and accordingly, computer usage by students must not take of place of interaction with the teacher. The traditionalists feel the bond between music teacher and student to be a particularly important student-teacher bond because the student must trust the teacher, for not only will the music teacher be instructing, but that same teacher will also be conducting the student in musical rehearsal and performance, evaluating the student’s musical

²⁸ Healy, Jane M. [Your Child's Growing Mind: A Guide to Learning & Brain Development from Birth to Adolescence](#) Doubleday, August 1994.

²⁹ LaGessee, David. “Instead Of Using It As A Doorstop.” [US News Online](#); Cover Story, 9/25/00.

skills, and sharing their musical abilities with the student. Traditionalists feel that the bond between music teacher and student is more intimate than any other student-teacher bond because of this sharing that occurs through music. They also stress that students cannot share with a computer because computers do not contain the human capacity to express emotion, whereas a teacher does. Another important aspect of the teacher-student relationship in music is that in most schools there are only one or two music teachers. Therefore, the students will work with the same teacher for the length of their education in that particular school. Professor David Elkind of Tufts University, former president of the National Association for the Education of Young Children, has pointed out how "ideally suited" such an extended relationship is for many children today, when parents are often pressed for time and children have often experienced frequent turnover in child-care providers:

“Because of the attachment of children to teachers whom they have been with for many years, the teacher becomes a much more powerful role model than when the child only has the teacher for a year. The class also becomes more like a family as the children grow up learning and working together... School-age children need someone who knows them as totalities and who can reflect this wholeness back to them. Having the same teacher for a number of years is one of the best compensations for the often truncated interactions of postmodern, permeable family life.³⁰”

Accordingly, traditionalists stress, above everything else, that a healthy student-teacher relationship in music education is the most important objective, and that this relationship *must* be maintained and nourished at any cost. They believe this cost is to put a moratorium on computer-aided instruction in music education. They feel computer-aided instruction weakens the important student-teacher bond and instead forces the student to have a “pseudo-relationship” - as the traditionalists point out that a computer cannot facilitate the actions necessary to actually fulfill a true relationship because that requires personal interaction on both parties - with the computer, which is not only unhealthy to the student, but also stifling to the creative process which is imperative to successful music creation.

I feel this issue is of major importance not only in the field of music education, but also to society as a whole. Since the beginning of time music has been a creative force that has had the ability to unite, and sometimes, divide society. This topic should therefore be looked upon with extreme care because “the growing availability of computers carries a profound significance for altering the role of music in our society,” and thus altering society because “music...operates

³⁰ Alliance For Childhood. “Fool’s Gold: A Critical Look At Computers in Childhood” Sept. 2000
<http://www.allianceforchildhood.org>

not merely in imitation of society but in dynamic interaction with it.³¹” Some educators take this statement too seriously, and feel that music should progress exactly as society does. But, our society is heavily centered around business, and “what's good for business is not necessarily good for students. We cannot afford educational policies that will expand the market for Microsoft, Compaq, IBM, Apple, and other companies at the student’s expense.³⁰” Some music educators don’t pay attention to that statement at all, and feel that the traditional methods that have been developed over the centuries must not bend to make room for the technological advances that have been integrated within our society. One thing is for sure. We must keep the young musicians in mind when dictating music education policies. I do believe, however, that there is a place for technology in music education and I would like to offer my solution.

In order to successfully integrate computer-aided instruction into the music education curriculum, a compromise must be struck between the moderates and the traditionalists. The technology must be used side by side with direct teacher-student interaction. In other words, computer programs should not be a substitute for teacher instruction, but rather an enhancer for such instruction. Along with this teacher-computer combination, I believe a collaborative learning process must be implemented as well, in which students work in groups around a computer terminal as the teacher instructs and explains. This type of environment enhances not only creativity, but the learning process as well, because “students virtually teach one another.” Furthermore, “they reinforce the teachers instructions, and share in decision-making and in evaluating results.³²” I feel that “a significant advantage of the computer-aided approach,” combined with collaborative learning, “is that students work on assignments *during* class time, in traditional courses, these assignments would have been done outside of class as individual homework. This is a clear time advantage for music students, whose professional goals require them to spend long periods practicing, rehearsing, and

³¹ Hoffmann, James A. “Computer-Aided Collaborative Music Instruction” Harvard Educational Review; v61 n3 p270-78 Aug. 1991

³² Hoffmann, James A. “Computer-Aided Collaborative Music Instruction” Harvard Educational Review; v61 n3 p270-78 Aug. 1991

performing.³²” Because students have access to the teacher while working on these assignments, the teacher is available for questions, help, and even individual consultations. This type of “immediate help is far more superior to the time-delayed written comments students would otherwise receive, which may not be understood and thus cannot contribute to the improvement of student skills.³²” By combining the use of traditional teaching methods with new-wave technology I feel that this solution can be reached. It is a solution which is healthy for the student, but at the same time encourages the necessary strong student-teacher bond and makes use of just enough computer-aided group instruction that the student’s creativity is encouraged rather than stifled.

One mystery remains, however. With such a rapidly increasing computer industry, new technologies emerge daily. Just as MIDI burst on the scene back in the 1970s and changed computer-aided music instruction forever, new technologies that have the power to do the same thing are on the brink of being developed. It won’t be long before a new revolution in computer-aided instruction begins, and thus a new debate will start before this one is even solved. The only variable is time.

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