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## **Electronic Article**

### **Fluency in General Music and Arts Technologies** Is the future of music a garage band mentality?

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## Fluency in general music and arts technologies Is the future of music a garage band mentality?<sup>1</sup>

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The global village (McLuhan, 1994) may increasingly seem to be evolving as a digital information network, but arts-based media are just as prevalent, and perhaps more influential. Human uses of computers far exceed text processing and Internet searches. In the hands of artists, computers and other new digital technologies are creative tools, much like paintbrushes, canvas, music instruments, and stage sets have been to artists of the present and past. Arts-based technologies are all around us, and they are permeated with arts content. The arts are fundamental to the content of all forms of new media, including learning and teaching technologies. That is because the foundations of new creative technologies are traditional forms of arts-based expressions.

In today's economy, one of the most important aspects of technology is the creative economy. John Howkins (2001) recently wrote, "the creative economy will be the dominant economic form in the twenty-first century." And scholar Shalini Venturelli (2000) preceded him with the notions that "wealth creation is dependent upon the capacity of a nation to continually create content," adding:

In short, a nation without a vibrant creative labor force of artists, writers, designers, scriptwriters, playwrights, painters, musicians, film producers, directors, actors, dancers, choreographers, not to mention engineers, scientists, researchers and intellectuals, does not possess the knowledge base to succeed in the Information Economy, and must depend on ideas produced elsewhere (p. 15).

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<sup>1</sup> This paper was written in April-June 2004 for the 2004MayDayGroup Colloquium, Amherst MA. Please check the following URL for multimedia files meant to accompany the paper: <http://m1.cust.educ.ubc.ca:16080/Artography/aura.htm> [See p.18 of this paper for additional information.]

According to the Intellectual Property Association, estimates for intellectual property sectors in the United States are “worth 360 billion dollars a year, making them more valuable than automobiles, agriculture or aerospace” (Robinson, 2001, p. 42). These perspectives, and many others, complement the rationale and support the clear argument that the arts need to be given a primary role in all aspects and levels of education, especially in the implementation of new technologies.

In many ways, culture is rooted in the arts. While one may argue that “public policy debates are connected to information technology” (Snyder, et. al., 1999), public policies are also profoundly influenced by the sounds and images that form the content of all aspects of broadcast and print media. Contrary to an information technologist’s reductionist perspective, animation and image creation is more than the mere movement and manipulation of bits and bytes of so-called “information.” With arts-based technologies, the content and all forms of media are dependent upon the creative abilities and skills of artists, and artists learn those skills in a variety of traditional and new contexts. If illustrating books and composing music were as easy as using an ATM machine, it would be easy to teach the basics of arts-based technologies as well as how to create with them.

I embrace a notion of “fluency” to describe the ability that all humans possess to create (e.g., compose, produce, perform) arts media (Gouzouasis, 2001; Gouzouasis, 2003; Gouzouasis & LaMonde, 2004). Fluency is defined by creative expression. While the National Research Council’s Committee on Information Technology Literacy (Snyder, et. al., 1999) has chosen to promote a notion of “fluency within information technology,” or FITness, I have chosen to promote a notion of FATness (i.e., “fluency within arts technologies”) as a label for the arts-based, broad understandings that are necessary in the use of emerging arts technologies.

FATness involves a number of interrelated dimensions – capabilities, artistic abilities, artistic skills, conceptual understanding, artistic expression, so-called “aesthetic” understandings, and intellectual capabilities. Humans who possess those abilities and capacities, and pursue those skills and knowledge, may become highly fluent within arts-technologies. FAT individuals are

able to use many forms of traditional and new arts-based technologies with a variety of content. In essence, the FATter we are, the richer our traditional and digital expressions may be(come).

Learning within the arts, and learning within arts-based technologies, is a lifelong endeavor. Moreover, it is multifaceted and multi-modal. For example, animators learn to draw with pencils and pens, as well as paint, with a variety of media before they learn the art of animation. Furthermore, traditional skills are learned before they learn to either push a mouse or use a digital pen to compose an animation sequence. On the other hand, music technologies seem to be pushing the traditional boundaries and challenging our notions of what constitutes music composition as well as notions of the abilities and skills humans need to learn to compose and perform music. One such example may be found in the recently released software called GarageBand (Apple, 2003). GarageBand is touted as the panacea for the musically and non-musically inclined person who wants to “compose” music. The most recent promotional material is as follows.

You don't have to play the piano. You don't have to read music. You don't even have to have rhythm. If you know what you like when you hear it, you can make your own kind of music. With GarageBand.

The easiest way for anyone – pro or novice alike – to perform, record and create music, GarageBand turns your Mac into a digital recording studio – complete with instruments, pre-recorded loops, amps, effects and editing tools. Why, you'll even find virtual recording engineers in the mix to help you out. You'll be spinning the music of the spheres in no time (Apple Computers, 2004).

As if with a sense of humor, the Apple promotions department is kind enough to add, “If you are musically inclined, you can do even more with GarageBand.” As a recent user, my best brief description of the application may be made with the analogy that GarageBand is to music, what iMovie is to film creation. Just as iMovie, and its sophisticated sibling Final Cut Pro, has profoundly influenced movie making, GarageBand may begin the transformation of the way that humans create and perform music.

The focus of this paper will be (1) to elaborate a critical discourse on notions of fluency with arts-based technologies, particularly in a music context, (2) to explore the relationship between FITness and FATness based on criteria elaborated by the National Research Council, and (3) to discuss the dilemma that music, and music education, faces in a society where software packages such as GarageBand may enable any person to seemingly compose music without traditional forms of music knowledge and music literacy.

### **What is this thing called fluency?**

See, if you put a musician in a place where he has to do something different from what he does all the time, then he can do that – but got to think differently in order to do it. He has to use his imagination, be more creative, more innovative; he's got to take more risks. He's got to play above what he knows – far above it – and what that might lead to might take him above the place where he's been playing all along, to the new place where he finds himself right now – and to the next place he's going and even above that! So then he'll be freer, will expect things differently, will anticipate and know something different is coming down. I've always told the musicians in my band to play what they know and then play above that. Because then anything can happen, and that's where great music happens. (Davis & Troupe, 1989, p. 220)

With a mind's eye toward creating a theory to explain abilities in creativity, in 1962, J. P. Guilford wrote about ingenuity, inventiveness, and originality (i.e., IIO) in thinking. For Guilford, IQ and IIO are not related. However, ingenuity, inventiveness, and originality are central to divergent thinking. Fluency of thinking and of originality is the pillar of Guilford's model; fluency, facility, and originality are considered as abilities. In a sense that they comprise a multiplicity of aspects, one may consider that Guilford's notions of "intellectual abilities" (p. 156) as the hard-core precursors to Gardner's notions of multiple intelligences.

Guilford proposed four constructs of fluency. He thought of *word fluency* as an "ability to think of words rapidly" (p. 157) in specific contexts, e.g., words containing a particular letter or syllables, or words with a specific combination of syllables and letters. *Ideational fluency* is the notion of rapidity in listing words in specific categories or listing and organizing ideas. *Associational fluency* is concerned with making connections (i.e., associations in an organicist

framework from the point of the human, not the object or antecedent) with words (i.e., verbal objects) in the same category (p. 158). Finally, *expressional fluency* is concerned with how words are organized into phrases and sentences. While those notions of fluency are interesting to ponder in a linguistic context, they are limited by the mono-dimensional representation of language as text. However, in traditional and new media contexts, where all forms of human expression may be combined in a variety of ways and textures, Guilford's ideas become rich and multidimensional.

One may consider *word fluency* in new media contexts extending to *visual fluency* and *aural fluency*. For example, visual fluency may be considered the ability to think of, cognitively organize, and manipulate visual patterns rapidly, in both animation and in digital video contexts. Aural fluency may be the ability think of, cognitively organize and manipulate aural patterns rapidly, in both music and in general audio contexts. In new media contexts, *ideational fluency* can be imagined as scanning, editing, and pulling together numerous, related images and creating a slide show or iMovie of those images. Speed is the keystone of ideational fluency, and it is dependent on as many viable ideas as can be developed in a short period of time. Using traditional concept maps and mind maps, and using software packages such as Kidspiration and Inspiration to rapidly brainstorm and organize ideas, are two ways that ideational fluency may function within rich, digital media forms. The creation of invented notation (i.e., using a broad variety of symbols and images to represent sounds and silence) is one way that ideational fluency may work in the composition of music soundscapes. In digital media contexts, *associational fluency* may be considered as the ability to identify and recognize similar structures (e.g., software menus, tools, and functions) across music software applications. On another level, it may be the ability to identify and recognize similar structures across all arts software applications. In traditional music contexts, it may be the ability to make inferential connections between simple aural and visual patterns. Also, it may be the ability to rapidly identify and edit patterns in MIDI sequences and AIF sound waves. Finally, in the 21<sup>st</sup> century, *expressional*

*fluency* may be considered the ability to put words, still images, film, music, and sound effects into a variety of traditional and new media contexts in a broad variety of combinations.

Guilford also proposed two different abilities related to the construct of flexibility (p. 158). *Spontaneous flexibility* is concerned with being flexible when there is no need to be. It is defined by making significant inferential leaps from one category to another in making connections between an object in a broad variety of categories. For example, rather than the use of a traditional slide show application, one may either use Kidpix to create a step animation using the slide show tool or use Flash, typically considered as a web animation tool, to make a slide show that contains more than merely text and bland graphics. *Adaptive flexibility* is an ability to solve problems, and is considered more of a focus on failure if a person is inflexible. Also, individuals may impose restrictions on themselves. For example, in creating a slide show a person may use iMovie to make a traditional slide show instead of Appleworks to make a richer, more interesting presentation. In my mind, flexibility may also relate to the notion of *facility*, the ease and speed with which a composer may shift between blending and manipulating MIDI and AIF files in software applications such as GarageBand.

*Originality* is another factor that Guilford was concerned with, however, one may question how it can be assessed. One may imagine a rubric that has a range to account for what constitutes commonplace, acceptable music and multimedia compositions, and what constitutes truly novel creations. However, to the knowledgeable, media fluent assessor who teaches and learns in a familiar instructional setting, originality is keenly apparent and represents the element of surprise. For example, in an assignment that required a report on the music research topic of audiation, a pair of pre-service teachers composed a beautifully illustrated child's book and read it to the class to explain the concept. In a related assignment, another pair of pre-service teachers composed a crude, yet brilliant film, "1-900-AUDIATE," that accurately depicts the concept of audiation in a comedic style and form.

For Guilford, divergent thinking and transformations are the key to creativity (p. 163). Curiously, but not surprisingly given the limited media involved, in his 1962 writings Guilford

believed that there was “no unitary ability to analyze and none to synthesize.” That was a major surprise to him in that “all individuals are not at all uniformly able to analyze in all situations and with all kinds of material” (p. 159). The same was true for a uniform ability to synthesize. I believe that may be more the product of the mono-dimensional, simplistic content and contexts that Guilford used to examine the two fundamental constructs of flexibility. In arts-based, technology enriched teaching and learning environments, the opportunities for multiple ways of knowing and expressing novel ideas from a variety of traditional and digitally enhanced experiences are limitless. And the complex fabric of multimedia enables the composer to fully explore the limits of fluency and flexibility.

### **Are we “FIT” to be “FAT”?**

Yasmin Kafai believes that “fluency connotes the ability to reformulate knowledge, to express oneself creatively and appropriately, and to produce and generate information (rather than to simply comprehend it)” (Snyder, et. al., 1999, p. 2). That understanding of fluency is foundational to the fluency within information technology (i.e., FITness) model, and contrasts fluency with the more commonly used term “literacy” and its contemporary synonym, “multiliteracies.” Taking notions of fluency one step further, as with most artistic enterprises, fluency within arts technologies (i.e., FATness) seems to not only be an ability to reformulate knowledge, but to formulate new knowledge (i.e., novel ideas) in ways that enable humans to see, hear, think, and express themselves differently. Also, it is arguable that the arts enable expression and creativity (i.e., creative expression through unique, inspirational compositional forms) more than any other forms of human knowledge do. Moreover, in pushing the boundaries of creativity, artists express themselves both appropriately and inappropriately. And frequently, artists’ inappropriate expressions are more interesting than their appropriate expressions. Finally, artists produce works of art that are frequently incomprehensible to viewers and listeners. Artistic creations are more than mere informational artifacts; they are the physical presentations and representations of works of art. In one sense, artistic creations may be considered the “facts” of “art.”



Paradoxically, some information technologists (Petrina, 2003) have attempted to argue a reductionist perspective of “art” that seriously challenges notions of artistic creativity and what constitutes “art” in and of itself. In proselytizing that educational technology (ET) and technology education (TE) are essentially one and the same, Petrina (p. 64) denounces the false separation of ET and DE through the International Technology Education Association (ITEA), which promotes standards for “technological literacy,” and the International Society for Technology in Education (ISTE), which promotes standards for “technology literacy.” With reference to the ITEA, ISTE and the arts, Petrina rants:

Some among us accept these monstrous configurations and hold ET to be the head and TE to be the hands. They await the arts or humanities to deliver the heart, the moderator between the head and hands. But I tell you, these arts, these humanities – this prophet – of the heart are as false as the associations’ construction of the monsters! (p. 65).

Petrina goes so far as to relegate digital audio and MIDI as a minor component in information technology (p. 73). However, Petrina and other “ET and TE” clones (Mitchell, Inouye, & Blumenthal, 2003) fail to acknowledge the distinct difference between content and technology that many people, including Verizon vice president Sarah Deutsch, have recently traced back to the player piano (Graham, 2002). For example, in an attempt to defend Kazaa – the successful peer-to-peer (P2P) file sharing technology – in litigation with Universal Music (Australia), Kazaa’s lawyers recently proposed that MP3 music files are not music any more so than piano rolls by relying on an 1899 British legal decision (*Boosey v. Whight*) that allowed the reproduction of perforated piano rolls, ruling that they did not infringe on copyright laws that protected sheet music (Kohler, 2004). In the 1899 brief, it was argued that the rolls actually formed part of the mechanism of the player piano. Essentially, lawyers presenting the case in Australia will argue that an MP3 file on a hard drive is not music, not a sound file, but merely an information segment of the computer drive.

The player piano was invented and patented as the “Pianista” in 1863 by Forneaux, and was introduced at the Philadelphia Centennial Exhibition in 1876 (AMICA, 2004). Interestingly,

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the concept was possibly derived from the automatic weaving loom, invented in 1804 by Joseph-Marie Jacquard, which wove silk fabric patterns according to holes in a card. George Kelly developed the slide-valve wind motor, and this device eventually became universally adopted as the type of motor to be used to cause rotation of the drive spool for paper music rolls in player-pianos, and in 1887, Edwin Welte introduced the perforated paper roll in Germany. From 1917 to 1962, piano rolls were mechanically marked in pencil by a recording pianola, but hand cut by a master worker.

One may question the analogies between the perforations in a piano roll, the computer punch cards of Babbage and Hollerith, and the digital (i.e., binary, zeroes and ones) orientation of information on the compact disk. As early as 1831, copyright statutes protected the reproduction of written music compositions, but not the reproduction of actual sound (Fessenden, 2002). Ironically, Philips Electronics, the company that invented compact disk technology in 1979, was also a manufacturer of mechanical musical instruments at the turn of the 20<sup>th</sup> century. Today, pianorolls.com is a site where one can order MIDI files of any work in the classical repertoire within two weeks. Supposedly, every ‘action’ (including dynamics, pedaling and exact tempo) is recorded digitally, much like the expressive actions that were recorded onto piano rolls a century ago. And the visual similarities between the dots and dashes of MIDI sequences and piano rolls are startling. Yet the differences between the mechanical replication of a music composition and the content and performance of the music in and of itself seems to be elusive as the fuzzy, relativist distinctions between what constitutes music composition are blurred by GarageBand enthusiasts.

Joe Gratz, articles editor for the *Minnesota Journal of Law, Science and Technology*, recently related to me that there is a U.S. Supreme Court case that is directly analogous to *Boosey v. Whight: White-Smith v. Apollo*, 209 U.S. 1 (1908). But the key difference is that this decision, like *Boosey v. Whight*, dealt with copyright in the musical work, not in the sound recording itself, which is Kazaa's main problem. Also, Gratz believes that the reasoning of *Boosey* and *White-Smith* would never hold up today; under the reasoning of those cases, as

compact disks in and of themselves are not technically sound recordings neither are piano rolls. The whole concept of removable media was unthinkable to the courts in early 20<sup>th</sup> century cases, since piano rolls were the first removable media ever used in a music device. However, to quote Gratz's web site, which he updated after I directed him to the National Post article (Kohler, 2004):

Australian copyright law is governed by the Copyright Act 1968, as amended. The Australian-law analog to the "phonorecord" is the "record," which is defined as "a disc, tape, paper or other device in which sounds are embodied." Copyright holders have the right "to reproduce the work in a material form." So for the Kazaa argument to work, an MP3 on a hard drive must not be a "material form." "[M]aterial form," in relation to a work or an adaptation of a work, includes any form (whether visible or not) of storage from which the work or adaptation, or a substantial part of the work or adaptation, can be reproduced."

### **Arranging:composing music::manipulating:creating new music?**

While there are many parallels between FITness and FATness, it seems we can also differentiate fluency within arts technologies from fluency within information technologies on a number of levels. Snyder (1999) and his associates claim that FITness involves three types of knowledge: intellectual capabilities, fundamental concepts, and contemporary skills. *Intellectual capabilities* are actually lifelong learning skills that are acquired in the context of information technology. On the other hand, there is a startling difference in all the arts. Lifelong learning skills in traditional forms of expression – from painting and acting to dancing and improvising music – both precede and continue to emerge in both traditional and new contexts, with both traditional and new tools.

*Fundamental concepts* refers to foundational knowledge, the "book learning part of fluency" (p. 10), though it is acknowledged that "it is highly doubtful that a decent understanding of information technology concepts" (i.e., computers, information systems, networks, digital representation of information, information organization, modeling and abstraction, algorithmic thinking and programming, universality of computers, limitations of information technology, and the societal impact of information and information technology) can be learned through books alone. It may easily be argued that the "concepts" that Snyder, et. al. (1999, pp. 18-22) present

have very little to do with concepts in performing and visual arts. Moreover, some may argue as to whether they actually constitute “concepts” in the cognitive sense of the term. In stark contrast, for performing and visual artists, concept formation is life long, beginning in early childhood, and kinesthetically rooted.

*Contemporary skills* “refer to the ability to use particular (and contemporary) hardware or software resources to accomplish information processing tasks” (p. 10). For Snyder, et. al., skills are exclusively computer rooted and computer facilitated (i.e., computer generated; p. 11). For performing and visual artists, it seems reasonable to suggest that skills need to be constantly developed with a variety of tools (i.e., technologies) and in a variety of media, with a variety of both contents and contexts. Yet, with the advent of new technologies such as GarageBand, an entire generation of “composers” and “musicians” who may be defined by the ethical ideals set forth by The Committee on Information Technology Literacy may be on the horizon. The proof is in the advertising.

### **Riffs Included**

How easy is it to create your own music in GarageBand? If you know how to click, drag and drop, you’re well on your way to becoming a GarageBand wiz. Since not everyone has a garage, let alone a band to invite over, we thought you might appreciate having a few professional musicians sit in on your sessions. You’ll find more than a thousand of their riffs on your Mac after you install GarageBand. These professionally-recorded Apple Loops are all royalty-free interludes, played in a variety of moods and genres, on many different instruments.

### **Tap your Inner Mozart**

Apple Loops form the building blocks for your songs. You can place them in infinite combinations of unique arrangements. Need a longer sound? Loops extend to any length you want. You can adjust the volume and balance of each track individually, even fade the volume of a selected track in or out (Apple Computers, 2004).

### **FITness may be dangerous to our health**

Every time I “play” with a class using GarageBand, I save a crucial question for the end of the session: “Were we just composing music?” The comments are broad based and not so

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surprising. Usually, most will argue that they were composing, until I pose the question, “Do you think it’s better if we use the term ‘arranging’ rather than composing music?” Most generalist teachers usually agree that only if original music, and not merely the regeneration and regurgitation of sound loops, is being entered into a track of GarageBand are they composing music. And some hold onto dreams of composing until I suggest that we consider an analogy with a hypothetical software application that features drag and drop clips and loops of pithy paragraphs, elegant prose, and clever vocabulary to write their next essay. Would that be considered language composition with English 101, compositional software for dummies?

Given the post-modernist, relativist distortions of commonly used music vocabulary (e.g., music, musician, guitarist, composer, arranger, music education) over the past 50 years, one may question the future of music teaching and learning in the 21<sup>st</sup> century on a number of levels. First and foremost, traditional notions of music literacy for the masses as proposed by Zoltan Kodaly and other music education icons are rapidly becoming irrelevant with the advent of emerging technologies. Today, traditional notation of music may be interpreted as being useful only in the performance of Western classical music and related forms. Second, the teaching and learning of music notation has become an even more specialized endeavor than it has ever been, even in historical terms. Notation will become a more exclusive technè (i.e., technological craft), relegated to learning and teaching in conservatories, the music monasteries of the 21<sup>st</sup> century.

On the other hand, notions of fluency, which have been prevalent throughout the evolution of most forms of music, as recently evidenced with popular forms of music in the 20<sup>th</sup> century, will continue to flourish, enabled by new technologies that eliminate the need of traditional notational forms. One challenge to our profession will be to harness the plethora of new teaching and learning technologies and incorporate them into all facets of music teaching and learning. Another challenge will be to move general music from the arcane practices of bonking on xylophones to making “real” music – music that children, adolescents, and adults can relate to, enjoy, and perform as a lifelong endeavor. That is because technology, in and of itself, is nothing without content and a powerful pedagogical framework. One way, and certainly not the only

way, to accomplish those challenges that may be through the use of existing, at one time innovative, yet now long forgotten, curricula and textbooks. Just as Guilford's notions of fluency were limited by the media of his day, there are music curricula that we were once unable to implement to their fullest potential because of the ineffective technologies available to music educators at the time. For example, the Manhattanville Music Curriculum Project (Thomas, 1969) which may be argued was more a "fluency" rather than "literacy" rooted curriculum, has been adapted by Gouzouasis & Woo (2004) for use with new software technologies such as GarageBand.

We are at a "crossroads," similar to the one that Robert Johnson faced when he "went down to the crossroads, trying to get ride" to leave his personal demons behind. One may argue that technologies have been both a blessing and a devil in disguise for musicians, especially over the past 100 years (Gouzouasis, 2000). There may not be a need to completely reinvent music, but we need to rethink the basic notions of what constitutes music education. Some in our profession may believe that we merely need to refocus priorities, continue to ghettoize our use of computers in something we call "music technology" – which in a sense is an oxymoron since language and music are among the earliest of human techne – and only partially acknowledge the new. However, if we continue to deny what is happening with our youth and the music that they listen to, and the music that they create without formal instruction or supervision, our profession will become even more irrelevant to general education – as irrelevant as the player piano.

Perhaps the most important aspect of music learning may be buried in a hidden curriculum of informal music learning. General music practitioners typically ignore much of what students know about music, how they relate to music in their lives, and how they have learned music, outside of the classroom. In science education, constructivist models of learning are used to frame learning in informal settings (Anderson, Lucas, & Ginns, 2003) and a definition of learning has emerged that is "unbound by time, institution, or social context (p. 178). While much of the research in science education is situated in and related to museum settings (Anderson, 2003; Piscitelli & Anderson, 2001; Wellington, 1990), it seems that concerts, and

other formal and informal music listening and performance settings (e.g., in a playground, garage, car, home, street, museum, park), may provide analogous insights into the nature, influences, and processes of learning in music education.

With the tools we have today, all forms of music can be both related to and relative to what children and adolescents are able to learn and compose on their own, but will we take the challenge? Moreover, if we do not turn the attentions of our profession to what is happening in the broad landscape of educational technology/technology education, we will lose yet another opportunity to demonstrate the empirical, praxial values (i.e., performatively, economically, and qualitatively) of music, and all the arts, in general education. The “only” thing holding us back is the traditionalist mentality that has been prevalent in our profession for the past 100 years. To quote a classic manuscript from 1969 (Thomas, p. iii),

Have you ever considered  
... if all the works and theory from 1780 to 1880 were suddenly lost to the world,  
music would still exist.  
... that notation is only a coding device, a storage and retrieval thing. It's a  
system for translating musical ideas for future recall, not for acquiring or  
developing music sensitivity or sensibility.  
... that a composition is merely a statement of musical thoughts, and everyone  
has musical thoughts.  
... what an 8<sup>th</sup> grader thinks after 8 years of general music.  
... that every significant musician throughout history has searched for new  
musical expressive possibilities. None has been content to merely duplicate the  
systems and idiomatic practices of his predecessors.  
... that methodologies are just substitutes for personal logic, the music educators'  
and the students.  
... that timbre is the medium of music.

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### Biographical Information

Peter Gouzouasis is an Associate Professor in the Department of Curriculum Studies at The University of British Columbia. He is the former music director of WRTI/JAZZ 90 in Philadelphia, which was the most listened to 24 hour jazz radio station in North America during the 1980s, and is also recognized for his work in writing and producing television and radio commercials broadcast across North America. His neo-organicist perspectives on music acquisition and learning led him to explore research in traditional and New Media contexts in the early 1990s. Peter was the first Authorized Trainer for Macromedia's multimedia products in Western Canada (1993-1998) and was the first person to teach interactive multimedia courses in British Columbia and Australia. He considers himself a lifelong learner of music and media, and still pursues serious studies of guitar and other fretted instruments and performance in jazz, North American folk, Celtic, and Greek music contexts. Peter currently coordinates the Fine Arts and new Media in Education (FAME) cohort, the first group of students to go 24/7 with laptop wireless technologies at UBC. He is the recent recipient of the Sam Black Award for Excellence in Education and Development in the Visual and Performing Arts (2003).

### Additional Multimedia

Please check the following URL for multimedia files meant to accompany the paper:

<http://m1.cust.educ.ubc.ca:16080/Artography/aira.htm>



[Note from author] I entered the score of Vivaldi's Summer Concerto from the Four Seasons using the scanning capabilities of Finale. Next, I imported standard MIDI files into GarageBand and reorchestrated the score using plucked string instruments. In the second movement, the solo violin part was performed using my Peavey Eddie Van Halen Custom Shop guitar through a Roland Mini Cube plugged into a USB input device to my PowerBook G4. I selected the Rectifier amplifier model on the Roland, and played around with the echo, reverb and sustain in the Basic Track setting in GarageBand to achieve the desired sound. This approach to performing a piece of classical music was inspired by many musicians in the past who have adapted classical music in popular settings. Most recently, Bela Fleck's recording of "Moto Perpetuo" has been a great source of music inspiration.