

## **Music Team Term Project**

**Teaching & Learning in the Digital Age, Fall  
Term 2004**

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Final Project Report

December 2, 2004

Erin Fukuda, Kassia Dellabough, Kellyclare Gardner

### **Music as a Discipline**

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#### **Define the Discipline:**

Art has been defined as a language of culture (McFee & Degge, 1977) and music is one of the many forms of art. Artists capture ideas and experiences to communicate through various artistic methods. Poets do this through language, visual artists through paint, pencil, charcoal, clay, and many other mediums, and musicians do this through sound. Musicians compose, conduct, perform, arrange, edit, and arrange clusters of sounds to obtain the desired effect. Fundamentally music is a process of organizing sounds. The discipline of music requires a set of skills and levels of mastery to both organize and reproduce sounds in an intentional way. Music also belongs in the category of perception whereby music is not merely the sound, or the perception of sound, but a means by which perception, action and memory are organized. There is also the aspect of music that evokes emotions by a deliberate combination of sounds. The knowledge required for mastery in this discipline spans listening, recording, composing, conducting, performance, reading, and appreciation.

In some disciplines such as math and science, students are asked to investigate how the world works and prove these theories with numbers and formulas. In music students incorporate numbers into their work as well, but in the form of time. Music compositions are distinguished by the amount of time a note is played or the amount of time between notes. Music stands alone as the only discipline where students learn a universal language that is accessible by all and can span language gaps.

#### **Expertise:**

In the world of music, there are many levels of expertise. Novice musicians may not have a solid understanding of music fundamentals in terms of theory, history or even technique with an instrument. Without this knowledge, communicating becomes difficult whether it is communicating to others about musical pieces or communicating through musical pieces. Novice musicians also may not have an understanding of the history and role of music within their own or other cultures. As these students progress in their musical education, they acquire a greater comprehension of the role of music as a cultural

language as well as skills and techniques to manipulate sound with more and more refined capacity for intended results.

Expert musicians have a firm understanding of music fundamentals such as tone, pitch, tempo, beat, emphasis, scales, notation, and dynamics. These fundamentals are the language of music with which expert musicians can communicate articulately with others. They can analyze musical works using this language and communicate their findings to other musicians. Experts can also use their understanding of fundamentals to compose and perform pieces that express the desired emotion, idea, and or theme. Expert musicians are knowledgeable of the history of music, ethics, and the role of music in different cultures.

Problem solving skills develop as students progress in expertise. For example, expert musicians not only know how adjust their instruments to trouble shoot problems with intonation and pitch, but they know how to blend their sounds in collaboration with other players. As students progress from novice to expert their knowledge base and skill level increase. Mastery in this discipline cultivates an appreciation for all of the expressive arts and engages in continual improvement and refining of skills and abilities. Assessment and self-reflection are essential for on-going growth.

### **Standards:**

To help guide this growth from novice to expert musician, national and statewide standards were created. MENC: The National Association for Music Education (n.d.) list the following standards:

#### **National Standards for Music Education**

1. Singing, alone and with others, a varied repertoire of music.
2. Performing on instruments, alone and with others, a varied repertoire of music.
3. Improvising melodies, variations, and accompaniments.
4. Composing and arranging music within specified guidelines.
5. Reading and notating music.
6. Listening to, analyzing, and describing music.
7. Evaluating music and music performances.
8. Understanding relationships between music, other arts, and disciplines outside the arts.
9. Understanding music in relation to history and culture.

At the state level, Oregon has Common Curricular Goals (Oregon Department of Education, 2004) to be used with all art disciplines. Each of the state standards fall into one of three categories: create, present, perform; historical and cultural perspective,

1. Aesthetics and Art Criticism:
  - a. Use knowledge of technical, organizational, and aesthetic elements to describe and analyze ones own art and the art of others.
  - b. Respond to works of art, giving reasons for preferences.
2. Cultural Historical Perspective:
  - a. Identify both common and unique characteristics found in works of art from various time periods and cultures.
  - b. Understand that the arts have a historical connection.

- c. Explain how a work of art reflects the artist's personal experience in a society or culture.
  - d. Understand how the arts serve a variety of personal, professional, practical, and cultural needs.
3. Create, Present, Perform:
- a. Apply artistic elements and technical skills to create, present and/or perform works of art for a variety of audiences and purposes.
  - b. Communicate verbally and in writing, using knowledge of the arts to describe and/or evaluate one's own artwork.
  - c. Express ideas, moods and feelings through various art forms.

## Content and Maturity in Music

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### Content:

Music content focuses on learning the language of music. As with learning any other language a large focus is on developing vocabulary. Common words and concepts that musicians need to be aware of and their definitions include (Classicalworks.com, n.d.):

- **Beat:** The unit of musical rhythm
- **Chord:** 3 or 4 notes played simultaneously in harmony
- **Chromatic scale:** Includes all 12 notes of an octave.
- **Clef:** In sheet music, a symbol at the beginning of a staff defining the pitch of the notes found in a staff
- **Dynamics:** Pertaining to the loudness or softness of a musical composition. Also the symbols in sheet music indicating volume.
- **Flat:** A symbol indicating that the note is to be diminished by one semitone.
- **Forte:** A symbol indicating to play loud.
- **Harmony:** Pleasing combination of two or three tones played together in the background, while the melody is being played. Harmony also refers to the study of chord progressions.
- **Intonation:** The manner in which tones are produced with regard to pitch
- **Measure:** The unit of measure where the beats on the lines of the staff are divided up into two, three, four beats to a measure.
- **Octave:** Eight full tones above the key note where the scale begins and ends.
- **Piano:** An instruction in sheet music to play softly. Abbreviated by p
- **Pitch:** The frequency of the note determining how high or low it sounds
- **Rhythm:** The elements of music pertaining to time, played as a grouping of notes into accented and unaccented beats.
- **Scale:** Successive notes of a key or mode, either ascending or descending.
- **Sharp:** A symbol indicating that the note is to be raised by one semi-tone.

- **Staff:** Made of five horizontal parallel lines and the spaces between them on which musical notation is written
- **Tempo:** Indicating speed
- **Tone:** The intonation, pitch, and modulation of a composition expressing the meaning, feeling, or attitude of the music.

Musical content also includes knowledge of basic instruments, history of music, the study of other cultures, and the role of music in culture. In the last two decades, recording technology has become one of the core components of basic skill sets in the music discipline and has required a greater awareness of ethical issues related to copyright law.

### **Maturity:**

As musicians gain knowledge of musical content, they must also develop their musical skills. Maturing musicians gain a better understanding of how physical elements of their instruments affect the tone, pitch, and volume. Using this knowledge, musicians can problem solve by adjusting their instrument to get the desired resulting sound. Musicians must also develop the ability to analyze works and create their own pieces. Students must learn to be expressive through their work in order to communicate their thoughts and feelings.

Another important aspect of maturity is the ability to play collaboratively with other musicians. For composers, this is the ability to write compositions that integrate the variety of musical tones to form a cohesive musical statement. Expertise requires highly developed listening skills as well as expert knowledge of chords, modes, standard progressions, musical keys, a large repertoire of compositions, in some cases reading music notation and in others an ability to improvise.

Students can continually strive to improve their pieces thanks to the capabilities of recording technology. Notation software has also added a tremendous tool for composers. In the same way that word processing allows writers to more easily revise and edit their words, notation software makes the revision and editing process of composition easier. Throughout the process, compositions become more meaningful or thoughtful.

### **Skill Transfer:**

Several skills can be transferred to other areas. For instance, being able to critique and analyze a musical composition is similar to the critical thinking and evaluation involved in analyzing a piece of literature. Monk and Poston (1999) relate these skills to the discipline of science, in that scientific theories must also be analyzed and evaluated. Innovation is also a critical part of both science and music (Monk & Poston, 1999). Also, the process involved in composition is similar to process writing, whereas both involve creating, editing, revising, revising, revising, and publishing. Parallels can also be made between the skills used in sight reading and skills used in the reading and math disciplines. Many people have heard news reports of studies like Cheek and Smith (1999) that correlate experience in music education with higher math scores. Such reports suggest that skills used in music may also be used in math. This relationship was further investigated by Gromko (2004), who concluded, “music reading draws on a variety of cognitive skills that include reading comprehension, audiation, spatial-temporal reasoning, and visual perception of patterns rather than individual notes.” Spatial reasoning and pattern recognition are skills important to the math discipline. Similarly, reading comprehension is a major focus in language arts and therefore should be taught as a skill to transfer between the two disciplines. The analysis, innovation, reading

comprehension, spatial-temporal reasoning, and pattern recognition involved in learning music are all skills that are transferable to the reading, writing, science and math disciplines.

## Role of ICT in Music

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### **Curriculum:**

ICT has opened up a new curriculum area to even the youngest and most inexperienced of musicians. The process of composition was once accessible only to musicians who had mastered an instrument. Musicians could not experience making music if they were not able to play it on an instrument (which includes vocal skills). Even if a student were to jot down random notes and have someone else play these notes, the composition could not be adjusted to obtain a desired result unless the composer could communicate clearly with the player to understand their changes. Current music ICT fulfills this need. ICT can emulate almost any instrument and can play compositions using this simulated sound. For example, students now can place random markings in the composition program, have the program play the piece back, and then adjust the notation to achieve the desired outcome. Students can choose to “sample” actual portions of master musicians and include them in their work. Novice musicians with just a basic knowledge of music notation can now compose.

With the development of software for both notation and recording, novice students can move into composition before they have mastered any techniques to play an instrument. In other words, a beginning student with basic computer skills and an introduction to a recording/composing software (such as GarageBand) can assemble instruments and create a composition for a jazz quartet without ever learning how to play drums, saxophone, bass or keyboards. In fact, this student can be alone and experiment with a variety of instruments to compose a piece of music. Through this experimentation, students can quickly grasp the roles different instruments play, such as drums keeping the beat and a saxophone carrying a melody. In the recent past, this level of music knowledge was taught only in high school, after students developed sufficient performance skill. However, with the developments in ICT it can now be taught at the elementary level.

Since ICT has greatly influenced the way students gain music information and skill, as well as the way in which they demonstrate their expertise, learning how to use ICT becomes an important part of the curriculum. As described above, some software can take the place of instruments. Learning to compose using a notation program requires mastering the computer as a musician would master any other instrument. Even students who can play instruments can benefit from ICT. Most computers now come with MIDI (Musical Instrument Digital Interface), which allows electronic musical devices to communicate with the computer. Instead of writing each note with the notation software, students who can already play a keyboard, guitar, or drums could play their instrument and have the software notate as they play. However, these students would still need to know how to use the software to arrange what is notated, save their composition, and return to revise it at a later time.

### **Instruction and Resources:**

ICT provides a multitude of new ways to students to analyze and respond to music. A basic level is the ability to discuss and respond to music. A few examples of this are word processing and discussion boards (online communication forums, where students and teachers can interchange ideas asynchronously :) Blogging is another form

of asynchronous communication, where students are able to post comments on music and receive feedback from their peers.

The Internet is another tool to help students expand their knowledge of musical concepts as well as historical and cultural components of music. Using the World Wide Web students can search for and access music and information about specific compositions and the people who made them. They can share music with their peers and engage in evaluation and critique of contemporary works reflecting their cultural experiences. Using the Internet, students also have the opportunity to communicate with live musicians, receiving feedback on many aspects of the music production process as well as the inspiration behind the music. This can be done via, instant messaging, email, blogging, video conferencing, voice conferencing, and online discussion boards.

Inexpensive software and musical toys have emerged as electronic educators. Kidpix, is a computer software program that allows students to create and design artistic works. There are a multitude of free or inexpensive software packages available that tutor students in various musical skills through interactive feedback. This includes learning basic beats, tones, rhythms and melodies as well as more complex melody development and musical composition.

Toys are available in mainstream stores that use technology to record and play back children's compositions, voice and beats and many provide corrective feedback. These toys start with children as early as six months old. Several examples include stuffed animals that sing the alphabet, keyboards that light up the keys required to play the melody, and drum machines that guide the student to hit the sticks with specific rhythmic patterns, even the game Simon that requires the player to imitate a pattern of notes to win.

Drill and practice software can also change music instruction. Learning the fundamentals of music such as the vocabulary and pitch recognition is done through training. The instant feedback and monitoring of individual progress makes training more effectively done by computers than by human teachers. (Moursund, 2004). Musicianship Basics is a piece of software that drills students on a multitude of items including terms and symbols, melodies and notes. Pitch Coach asks students to identify a pitch on the keyboard after the note is played. Both of these pieces of software have free demo version and can help train students to acquire fundamental music vocabulary and skills (Hitsquad Pty Ltd, 2004).

### **Assessing ICT Components:**

The use of technology now allows students to manipulate synthetic instruments to create synthetic sounds and incorporate them into their compositions at a much earlier stage of musical education. Students can be authentically assessed on their ability to compose rich works of music in addition to their ability to perform through live presentations as well as automated feedback built into software or electronic toys.

Students can work constructing melodies and full compositions and obtain immediate corrections and feedback from the software as they select notes, keys and rhythms for their work. The final compositions can be recorded, and played in front of a live audience similar to any other recital. Teachers can assess characteristics of the composition during the performance. The student can also receive peer feedback. This directly reflects the evaluation process in the real world. Professional musicians are graded by their peers and knowledgeable critics during performances of their work.

Student's progress in gaining fundamental knowledge in music can be recorded by the drill and practice software. This record can then be used to grade students on individual progress as well as monitoring their progress towards meeting state and national standards. Students can also be assessed on their interpretation and appreciation of music and their understanding of cultural and historic contributions. This can be done by analyzing the students' word processed documents, Kidpix creations, online journals, and discussion board responses, for the inclusion of cultural, historic information and logical explanations of interpretations.

### **Basic Competency Requirements for Teachers: Music and ICT:**

The International Society for Technology in Education has created a national set of standards for educational technology competency (NETS). The list attached as an appendix represents the six core areas that translate across disciplines. The fundamental requirement is an understanding of how technology can be integrated into curriculum to enhance and evolve the capacity of students to acquire greater and greater knowledge and skills within a discipline.

Teachers need to become familiar with the basic competencies in music in order to guide and evaluate student learning. There are numerous resources available as listed in the Appendix and References section for both successful technology integration and acquisition of basic musical knowledge.

## References

Cheek, J.M. & Smith, L.R. (1999). Music training and mathematics achievement.

This study correlates receiving music instruction with higher mathematics scores on a basic skills test. An explanation for this correlation is not investigated in this study. The research is used in our paper as an example of findings that associate math performance and involvement in music and therefore to suggest possible transferable skills between these two disciplines.

Elson, A. *The Book of Musical Knowledge: The History, Technique, and Appreciation of Music, Together with Lives of the Great Composers, for Music-Lovers, Students and Teachers* Houghton Mifflin, 1927

An old yet wonderfully comprehensive text reviewing the early development of instruments as well as tracing composers and cultural events impacting musical eras.

Glossary of musical terms. (n.d.). Retrieved November 28, 2004, from <http://Classicalworks.com/html/glossary.html>

This glossary defines many common musical terms. It was used in this paper to define basic terms, as examples of the language that is part of musical content.

Gromko, J. E. (2004). Predictors of music sight-reading ability in high school wind players. *Journal of Research in Music Education*, 52(1), 6-15.

The results of this study supported previous findings that reading music is not just a process of perceiving individual notes, but that it requires a variety of cognitive skills, which are also used in math and reading. The information provided by this article was used to identify other skills developed through music education that could be transferred to different academic disciplines.

Hitsquad Pty Ltd. (2004). The musician's web center. Retrieved November 27, 2004, from <http://www.hitsquad.com/>

This site provides links to a multitude of music resources including sheet music, books, MP3 software, database of musicians, and music software. There are over 5,000 free download of either demo or full software programs that meet almost any music software needs a teacher or musician may have. From this site we found examples of drill and practice software and notation software that could be used in an elementary classroom.

ISTE: International Society for Technology in Education web site for National Standards for Technology in Education from <http://www.iste.org/standards/>

This site provides provides an overview of the national standards for technology in education as well as a list of states currently using the standards. (90%) There are links to specific standards for students by grade, teacher's performance indicators, and administrators. There are additional links to curriculum, lesson plans, examples and award winning schools and programs.

McFee & Degge. (1977) *Art, culture, and the environment: A catalyst for teaching.* Wadsworth Publishing

This text is a seminal work regarding the study of art as language of culture. This book explores the relationship of art making to the expression of cultural values through music, dress, ritual, performance and visual arts.

MENC: The National Association for Music Education. (n.d.). National standards for music education. Retrieved November 28, 2004 from <http://www.menc.org/publication/books/standards.htm>

This site provided the nine national standards for music as created by MENC: The National Association for Music Education. The standards were used in this paper to better describe the demands of the music discipline as specified at the national level.

Monk M. & Poston M. (1999). A comparison of music and science education. *Cambridge Journal of Education*, 29(1), 93-101.

This article compared the skills of analysis and innovation of musical pieces to the analysis and innovation of scientific theories. The authors argued that by dedicating the focus on both critical analysis and creative innovation that is found in England's National Curriculum to their science curriculum inadequacies in science could be filled. This information was used in our paper to illustrate skills that can transfer from music to other academic areas.

Moursund, D. (2004, September 30). Class discussion. TED 610: Teaching and Learning in the Digital Age (1).

This first class discussion was focused on the big ideas of the role of ICT in education. During this time Dr. Dave Moursund stated that computers have become better at training people than human teachers. This idea is applied here to discuss how instruction of fundamental music vocabulary and basic skills such as pitch identification are taught through training. Therefore, this musical training should no longer be done just by a human teacher, but it should incorporate the use of such training software.

Oregon Department of Education. (2004). Oregon Standards Section A: The Arts. Retrieved November 28, 2004, from <http://www.ode.state.or.us/search/results/?id=38>

This site provided the state standards for music as created by the Oregon Department of Education. The standards were used in this paper to better describe the demands of the music discipline as specified at the state level.

Recording Technology History website retrieved November 10, 2004  
<http://history.acusd.edu/gen/recording/notes.html#origins>

This site provides a chronological history of inventions in the recording field and includes images, stories and key people who influenced the direction of both science and the music recording industry



## Lesson Plan and Training Resources

<http://www.iste.org/resources/curriculum/k-12/music.cfm>

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### **Artful Minds**

Theoretical information and practical applications about arts education, brain research, and technology use and integration including tools to increase cultural literacy, develop global citizenry, and create classroom environments that promote lifelong learning.

<http://library.advanced.org/50072>

### **Music Notes, Inc.**

A supplemental curriculum available directly from the Internet, teaching all children in Grades K–8 to read music.

<http://musicnotes.net/>

### **Music Technology & Lesson Plan ideas**

This site assists prioritizing needs before purchasing equipment by asking how it will be used. They promote that all technology should be seamlessly integrated into the subject - it is not a replacement for traditional teaching. They review five basic ways to use music technology: 1) for musical and performing support; 2) for drill and practice; 3) for student research; 4) for creative student learning, composition, and musical exploration; and 5) as a teacher resource. Suggestions include academic classes and performing groups and specific software titles are suggested.

<http://home.earthlink.net/~celder23/mtcurric.html>

### **Play Music**

This site teaches children about the instruments of the orchestra. It includes pictures, descriptions, audio examples, games, "meet the artist", and links to other music sites. This Site was built by: The American Symphony Orchestra League.

[www.playmusic.org](http://www.playmusic.org)

### **Technology Institute for Music Educators**

Organization supports promotion, development, and training of technology used in music education. TI:ME has a bank of clinicians, resources, and other material available to support technology in music education. The organization also has a certification program for individuals to become proficient in using music technology, as well as a series of summer workshops to support the certification program.

[www.ti-me.org](http://www.ti-me.org)

### **Tritone Music**

With just a keyboard, midi interface cables and a connection to the internet the Tritone™ Music Series is affordable, and can be easily delivered into the classroom or home. This remarkable state of the art online music education program is user friendly, comprehensive, convenient and a fun way to learn music.

[www.tritonemusic.com](http://www.tritonemusic.com)

## The Musician's Web Center

This site provides links to a multitude of music resources including sheet music, books, MP3 software, database of musicians, and music software. There are over 5,000 free download of either demo or full software programs that meet almost any music software needs a teacher or musician may have. From this site we found examples of drill and practice software and notation software that could be used in an elementary classroom.

<http://www.hitsquad.com/>

**MENC:** The National Association for Music Education. (n.d.). National standards for music education.

<http://www.menc.org/publication/books/standards.htm>

### Music & ICT Resources and Lesson Plans:

This site provides a wide variety of lesson plans for K-12 as well as free software including examples of projects created by students.

<http://www.hitchams.suffolk.sch.uk/ictmusic/>

## Programs

*Integration of ICT into K-12 curriculum for the Alberta School System.* The Alberta ICT program of studies emphasizes technology as a 'way of doing things' – The curriculum it specifies what students from Kindergarten to grade 12 are expected to know, be able to do, and be like with respect to technology. This ICT curriculum provides a broad perspective on the nature of technology, how to use and apply a variety of technologies, and the impact on self and society. As technology is best learned within the context of applications, activities, projects, and problems that replicate real-life situations, the ICT program of studies is structured as a 'curriculum within a curriculum', using the core subjects of English Language Arts, Math, Science and Social Studies as a base.

<http://www.learning.gov.ab.ca/ict/ictfront.asp>





## Handout: Presentation Outline

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1. Music as a discipline: process of organizing sound
  - Reproducing sound in an organized way through:
    - a. Performing
    - b. Composing
    - c. Conducting
    - d. Recording
  - Understanding the organization of sound through
    - a. Listening
    - b. Analyzing
    - c. Interpreting
2. Progression to mastery
  - Novice acquires basic terminology and skills, rudimentary knowledge of roles of music in culture.
  - Expert manipulates elements of music in thoughtful and intentional ways to express ideas and emotions. Extensive knowledge of historical and contemporary musicians and music as it relates to culture and society.
  - Content maturity reflects an ability to work collaboratively, improvise, problem-solve and engage in on-going reflection and improvement
3. Standards
  - Meeting benchmarks in singing, performing, improvising, composing, reading, listening, analyzing, and understanding the role of music in history and in contemporary culture.
4. Skill transfer
  - Skills acquired through the study of music include special reasoning, critical thinking, innovation, evaluation, listening, and analysis.
5. History of Music Technology
  - Development of instruments: wind, string, percussion
  - Development of printing allowed for reproduction of musical scores

- Development of amplification
  - Development of recording
  - Development of digital tools: synthesizing, recording, etc.
6. Contributions of ICT to Music education
    - Access to composition tools accelerates access by younger students
    - Internet and web dramatically increases access to music and musicians globally
    - Blogs, Instant Messaging, MP3 allow peer-to-peer music sharing and evaluation
    - Overall increase in collaborative opportunities
  7. FREE SOFTWARE! (see handout)
  8. Music Assessment with ICT
    - Self-correcting software
    - Recorded performance evaluation
    - Automatic grading and feedback
  9. Music & ICT competence for teachers
    - ISTENets – standards for integrating technology into curriculum for students, teachers and administrators
    - Music fundamentals needed to facilitate and evaluate student's needs and progress.
    - Learn about music: The music room  
[http://www.empire.k12.ca.us/capistrano/Mike/capmusic/music\\_room/themusic.htm](http://www.empire.k12.ca.us/capistrano/Mike/capmusic/music_room/themusic.htm)
    - Music History: <http://library.thinkquest.org/15413/history/music-history.htm>

