

A MUSIC-IN-EDUCATION RESEARCH CASE STUDY
**THE CONSERVATORY LAB CHARTER
SCHOOL–NEC RESEARCH CENTER
'LEARNING THROUGH MUSIC'
PARTNERSHIP (1999-2003)**

by

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Featuring the work of Heather Katz, Grade 3 Teacher, and Abner Baez, Music Specialist, and their colleagues at the Conservatory Lab Charter School. Additional contributions from Martin Gardiner, Randy Wong, Fred Sienkiewicz, Ashima Scripp, and Melanie Howell, Research Assistants, New England Conservatory Research Center for Learning Through Music.

THE CONSERVATORY LAB CHARTER SCHOOL IN BOSTON REPRESENTS AN ALTERNATE STRATEGIC APPROACH TO INTRODUCING ARTS INTEGRATION INTO SCHOOL DISTRICTS. THE LAB CHARTER IS LEARNING QUICKLY AND DEEPLY ABOUT HOW PARALLEL PROCESSES IN MUSIC AND OTHER SUBJECTS CAN BEST BE ENGAGED. ...THERE IS A SMALL HANDFUL OF CHARTER SCHOOLS ACROSS THE COUNTRY THAT HAVE SIMILAR APPROACHES TO TEACHING AND LEARNING...NONE OF THEM, THOUGH, IS AS FOCUSED AS THE LAB CHARTER ON INTEGRATING ARTS FORMS ACROSS THE CURRICULUM, CONTRIBUTING TO BROADER UNDERSTANDING OF HOW INTEGRATION WORKS BEST AND/OR HOW TO ALIGN CONTENT AND SKILLS IN AN ART FORM WITH CONTENT AND SKILLS IN OTHER SUBJECTS.

—NICK RABKIN IN PUTTING THE ARTS IN THE PICTURE:
REFRAMING EDUCATION IN THE 21ST CENTURY (2004) AFTER VISITING
THE CLCS IN THE SPRING OF 2003 WITH A GROUP OF EDUCATORS FROM
THE MUSIC-IN-EDUCATION NATIONAL CONSORTIUM.

**A PROTOTYPE FOR COMPLEX DOCUMENTATION,
ASSESSMENT, AND RESEARCH**

A “learning through music” laboratory school partnership with New England Conservatory’s Research Center established prototypical standards for the RUBRICS CUBE System in the early years of the Conservatory Lab Charter School’s development from 1999-2003. As demonstrated by this case study report, generative models for curriculum development, teaching practices, student work documentation, and teacher professional development outcomes took root at the Conservatory Lab School in the context of New England Conservatory’s Music-in-Education Guided Internship Program and guidance from members of its Research Center, three partnering institutions directed by Larry Scripp and his colleagues.



LARRY SCRIPP IS CHAIR OF THE NEW ENGLAND CONSERVATORY MUSIC-IN-EDUCATION PROGRAM AND DIRECTOR OF NEC'S RESEARCH CENTER FOR LEARNING THROUGH MUSIC. HE IS THE PRINCIPAL INVESTIGATOR OF THE MUSIC-IN-EDUCATION NATIONAL CONSORTIUM AND THE EXECUTIVE EDITOR OF THE NEC JOURNAL FOR MUSIC-IN-EDUCATION



CLCS teachers Heather Katz (far left) and Abner Baez (far right) just prior to the “Research to Practice” presentation “Music as a Fundamental Medium and Model for Learning: The Evolving Role of Music in Public Schools” on July 20, 2004. Larry Scripp and Anne Fennell (center) also presented preliminary results from the Music Ventures Project in Vista, California [Scripp & Reider 2007]. Overall, the research methodology showcased in this presentation became a point of departure for creating the RUBRICS CUBE system in the context of MIENC’s Learning Laboratory School Network.

As indicated by the quotation from Nick Rabkin above, the chief significance of the CLCS experiment rests in its investigation into how integration can be used (1) to align content and engage music learning processes in other subjects, and at the same time, as we shall see below, (2) to administer longitudinal testing of all children’s progress with performance, listening, reading, writing, and improvisation skills as measured by the Music Literacy Skills Test [Scripp and Reider 2007; music-in-education.org].

During these years the partnership faced the challenges of conducting complex documentation, assessment, and research practices in a school culture that had yet to stabilize in the face of uncertainty with funding, space and building operations, transience of students, and administrative and governance leadership. Nonetheless, evidence of substantial academic improvement linked with growing excellence in music emerged through assessment instruments and

methods described here, presented and discussed at national education forums, and reported in other publications (Rabkin & Redmond 2004; Scripp & Subotnik 2003; Scripp, Keppel, & Davidson 2000; Scripp (2003).

The preliminary success of this small prototype school led in 2002 to the NEC Research Center turning its attention to the formation of the Music-in-Education National Consortium and, in 2005, to the formation of a national Learning Laboratory School Network (LLSN). The RUBRICS CUBE System thus traces its roots back to the creation and application in partnership with the CLCS; however, as indicated in the previous article, this system has now become fully articulated as a guiding framework for consortium research by leaders of the Music-in-Education Learning Laboratory School Network and will soon be expanded into school district initiatives stemming from laboratory school ‘generative practices’ to be reported in the next issue of the *Journal*.

THE COLLECTIVE VISION OF A PROTOTYPE MUSIC-IN-EDUCATION LABORATORY SCHOOL

Membership in the MIENC requires the collaboration among schools, arts learning organizations and institutions of higher education. In the case of the Conservatory Lab Charter School (CLCS), the central philosophy of the school emerged from a team of NEC faculty already at work in a pilot Learning Through Music school project with the Johnson Elementary Public School in Nahant, a north shore community just north of Boston. The philosophy and expected outcomes of learning through music were framed in the charter proposal [Scripp 1998] of a soon-to-be-created laboratory school program.

MUSIC AS A UNIVERSAL MEDIUM AND MODEL FOR LEARNING

Music is commonly thought of as a universal language because it crosses the boundaries of culture and time. Furthermore, most people from any culture become exposed and attracted to music at a young age, often learning to sing or play instruments, and otherwise keep listening to music throughout their lives.

Music, described as “a universal language of learning” in the CLCS charter proposal, engages all children in and after school hours. For young students growing up musically, the joyous experience of learning to perform, compose, analyze, and even listen to music requires an enormous commitment to challenging personal and group work, and that comprehensive musical study engages multiple processes of learning:

“The Learning Through Music philosophy embraces the belief that all pupils can benefit from music instruction, from learning other subjects in conjunction with musical studies, and from a school culture that uses the process of musical growth as a model of learning in all subjects. Accordingly, in this school, a comprehensive study of music serves as the ‘universal language of learning’

because of its effectiveness in engaging every child physically, emotionally, and cognitively, often simultaneously.” (Scripp 1998)

Formidable as the medium of musical learning is, learning through music recognizes that music also serves as a model for learning integrated across disciplines. Thus, a school community dedicated to comprehensive music program development also must dedicate itself to observing and documenting evidence of music’s association with learning in other subject areas:

“It is also the philosophy of this school that, as music activities are threaded throughout the school day, children can learn to approach other academic subjects with a similar level of physical, emotional, and intellectual stimulation. Accordingly, teachers in this school will be challenged to foster and/or observe evidence of learning transfer from musical skills across the curriculum. In particular, teachers and researchers will document closely the changes that occur in each child as music becomes the foundation for ever-increasing listening and observation skills, improved physical coordination, a more active imagination, increased powers of memorization, and improved reading and interpretive skills, all of which may prove essential to the development of literacy in various disciplines, regardless of cultural background or initial proclivity for music.” [Ibid.]

As a laboratory school born out of New England Conservatory’s dedication to enriching music culturally and educationally, we envisioned the continuous guidance of Music-in-Education faculty members and researchers would create a culture of action and experimental research grounded in the development of the LTM curriculum and made visible to others by capturing evidence of student learning in documentation and assessment practices featured in CLCS teacher portfolios. As the school stabilized and increased its capacity to create innovative music and music-integrated units, it was thought that a growing body of research

AS A LABORATORY SCHOOL BORN OUT OF NEW ENGLAND CONSERVATORY’S DEDICATION TO ENRICHING MUSIC CULTURALLY AND EDUCATIONALLY, WE ENVISIONED THE CONTINUOUS GUIDANCE OF MUSIC-IN-EDUCATION FACULTY MEMBERS AND RESEARCHERS WOULD CREATE A CULTURE OF ACTION AND EXPERIMENTAL RESEARCH GROUNDED IN THE DEVELOPMENT OF THE LTM CURRICULUM AND MADE VISIBLE TO OTHERS BY CAPTURING EVIDENCE OF STUDENT LEARNING IN DOCUMENTATION AND ASSESSMENT PRACTICES FEATURED IN CLCS TEACHER PORTFOLIOS.

would serve the purpose of sharing findings with the NEC community, the charter school community, the local district, and with a growing professional society of educators, administrators, musicians and researchers interested in new understandings of the relationship between music and learning for elementary school students. As stated in the charter proposal:

“The primary deliverable of this school is the development of a model ‘Learning through Music’ program for public elementary schools that meets the highest standards of musical and academic achievement and suggests clearly how music and learning in other disciplines can be integrated. The development of this model will be guided by faculty from the New England Conservatory, early childhood music specialists, and experts in learning academics through the arts. Teachers will be selected not only for their expertise in their primary disciplines, but also for their willingness to create, document and evaluate aspects of teaching and student assessment practices focused

on learning through music. This school will also serve the Boston community as a laboratory for professional development and research focused on the impact of learning through music.” [Ibid.]

TWO COMPLEMENTARY INQUIRY-BASED CONCEPTUAL FRAMEWORKS FOR LEARNING THROUGH MUSIC

The underlying principles of the ‘learning through music’ curriculum and assessment frameworks are focused on two fundamental aspects of learning: process and content.

The Five Processes Framework

Before the CLCS opened in 1999, the MIE faculty and research staff at NEC had developed a strong conceptual focus on music learning processes (aligned with national standards in music) in other laboratory school programs as a way to document and evaluate how broadly defined musical cognitive skills can serve

The Learning Through Music Five Processes Framework

To what extent are teaching and learning enhanced in any subject area by engaging in five cognitive processes authentic to comprehensive musical experience, study, and skill development?

- **LISTEN** – perceive, pay attention, observe, discriminate, decipher . . .
- **QUESTION** – inquire, investigate, hypothesize, test, discover . . .
- **CREATE** – invent, improvise, produce, compose, transform . . .
- **PERFORM** – demonstrate, recite, practice, memorize, interpret, master skills . . .
- **REFLECT** – make connections, self-assess, set goals, plan, reconsider . . .



The Learning Through Music 'Five Processes' Framework

as a basis for a engaged learning across the curriculum. Framed as inquiry-based action research, a set of five musical learning processes served as a framework that guided the quality of curriculum and assessment of experiential learning in laboratory school programs. The guiding research question became: *To what extent is teaching and learning enhanced in any subject area by engaging—sequentially or simultaneously—five cognitive processes authentic to comprehensive musical experience, study, and skill development?*

At the CLCS, the LTM Five Processes Framework (above) served as a broad taxonomy for curriculum design, teaching, documentation and assessment of student work. The multiple descriptions of each category allow for its translation across domains and a greater inclusion of cognitive aspects of social-emotional development [see Scripp & Keppel, Eds.

JLTM II, 2003, Caryn Claar's Teacher Portfolio, "Five Processes at Work," for a more detailed description of the CLCS frameworks and examples of its application to academic and music-integration teacher practices].

The 'Shared Fundamental Concepts' Music-Integrated Teaching & Learning Framework

Freely adapting Jeanne Bamberger's work with young children on music and science [Bamberger 2000], the Research Center sharpened the focus on strategies for exploring concepts shared between music and other disciplines [see chart below]. Framed as inquiry-based action research, a set of five musical learning processes served as a framework that guided the quality of curriculum and assessment of experiential learning in laboratory school programs. The guiding research question

became: *To what extent is music and music-integrated teaching and learning enhanced by the exploration of fundamental concepts, historical contexts, and representation systems shared across disciplines?*

The identification of fundamental concepts shared across domains has become a foundational element of music-integrated teaching and learning in NEC partnership laboratory school programs since 1998. In the CLCS-NEC partnership, these frameworks generated innumerable occasions for structuring interdisciplinary thematic units, academic enhancement lessons, assembly programs, and culminating events which eventually formed the basis for a 'scope and sequence' for the Learning Through Music Curriculum in the school. As broadly defined in the chart below, the understanding of common concepts, contexts, strategies, and procedures provide new benchmarks for teachers' and students'

The 'Shared Fundamental Concepts' Music-Integrated Teaching & Learning Framework

To what extent is music and music-integrated teaching and learning enhanced by the rigorous investigation of fundamental concepts, historical contexts, and symbol systems shared across disciplines?

Language and Music: words, theme, syntax, dialogue, expression, character, narrative, reading, composition . . .

Math and Music: number, unit, sequence, patterns, proportion, hierarchy, duration . . .

Science and Music: measurement, categorization, systems thinking, discovery, experimentation . . .

History and Music: timeline, cultural studies, social-geographic context, biography, anthropology . . .

Movement and Music: timing, coordination, expression, gestures . . .



Visual Art and Music: composition, color, shape, design, abstraction, perspective . . .

Computers and Music: composition, orchestration, drill and practice . . .

Social-Emotional Development and Music: empathy, collaboration, self discipline, self-assessment . . .

The Learning Through Music "Shared Fundamental Concepts" Content Integration Framework

investigations into how music and music-integrated teaching and learning can generate rich, multi-representational evidence of meeting local, state, or national standards of content knowledge in music, math, language arts, history, and science.

THE CLCS TEACHER PORTFOLIO AS AN ACTION RESEARCH ASSESSMENT AND RESEARCH TOOL

For the Research Center, teacher and student portfolios have long been the focus of authentic assessment of arts learning in schools [Davidson, Crouch & Norton 2000; Winner, Davidson & Scripp 1992]. Because of the explicit mission statement of the charter proposal and the two broad action research questions stated above, teacher portfolios became tools for practitioner-based action research.

In the first four years at the Conservatory Lab Charter School, classroom teachers and music specialists created professional development portfolios that served to organize and present samples of an entire year's work from five perspectives:

- 1) classroom and curriculum design and management
- 2) observations of classroom practice
- 3) accountability for documentation and assessment of student achievement
- 4) adherence and contribution to the mission and values of the school
- 5) professional development as a teacher

Thus, each teacher portfolio was expected to include:

- an introductory statement describing the contents of the portfolio and a guiding personal philosophy of teaching and learning related to the CLCS mission;
- sample independent and peer within-discipline and music-integrated curriculum work;
- sample within-discipline and music-integrated student portfolio work;
- samples of and reflections on three pre-post Music Literacy Skill Tests and academic test profiles;
- a sample of Stanford academic test results and an interpretation of their relationship to class work and internal tests;
- an example of self (and/or peer)

assessment (description, observations) of teaching, assessment practices, portfolio management, reflections on professional development outcomes; and

- a summary reflection on the year's work and plans or aspirations for next year's work.

Professional development support for the teacher portfolio was ongoing, taking place during weekly teacher meetings and collaboration time with the curriculum consultant as part of their ongoing work as teacher-action researchers. Teachers were expected to develop and revise their portfolio work as the year progressed, giving special attention to reflection and planning of each trimester's work, the culmination of long-term projects and special events, and issues raised in the CLCS teacher review process and faculty meetings.

During the course of the partnership with the NEC Research Center, the teacher portfolios became rich collections of work artifacts that provided rich description and evidence of the individual teacher's interpretation of work, questions, and issues raised throughout the year. Selections of student work in the CLCS teacher portfolio served also as a source of exemplars of internal standards of student work that were later entered into the permanent electronic portfolio files managed by the school.

CLCS MUSIC TEACHER PORTFOLIO EXHIBIT: Excerpts from Abner Baez's Portfolio

The RUBRICS CUBE System suggests that the understanding of connections and levels of quality among factors of curriculum design, teaching, pre-professional training, student work documentation, and professional development outcomes will best explain changes in student engagement, progress, and achievement. Thus, excerpts from the teacher 'professional development/ portfolio' provide contextual information for examining evidence of musical and academic progress the students made during the first three years of the CLCS.

DURING THE COURSE OF THE PARTNERSHIP WITH THE NEC RESEARCH CENTER, THE TEACHER PORTFOLIOS BECAME RICH COLLECTIONS OF WORK ARTIFACTS THAT PROVIDED RICH DESCRIPTION AND EVIDENCE OF THE INDIVIDUAL TEACHER'S INTERPRETATION OF WORK, QUESTIONS, AND ISSUES RAISED THROUGHOUT THE YEAR.

Abner Baez's introduction to his portfolio (Artifact 1 page 209) provides some insights into the evolving role of the music specialist in a laboratory school for learning through music. The introduction clearly portrays the music teacher as an agent of innovative curriculum practices that help the outsider understand how 'skills in music and its connection with academic classes' are seen in the documentation of student work as the LTM program unfolded throughout the year.

FIVE ARTIFACTS FROM THE MUSIC-MATH CURRICULUM

The next five examples were configured as part of an ongoing music-math project that featured the use of 'multiple representations' of quantitative aspects of music reading, composition and analysis in music-integration projects and in the Metropolitan Opera Guild's thematic interdisciplinary Creating Original Opera program at the CLCS.

The study of rhythm music notation provides an alternative symbol system for understanding fundamental concepts of duration, proportion, ratio, and fractions. In CLCS Music Teacher Portfolio Artifact 2, Abner Baez concentrates on the students' conceptual understanding of music durations that are directly proportional to each other regardless of what speed (tempo) or what duration is assigned to a particular note by the composer. The chart proceeds top to

bottom from "a whole note" to its subdivision as half, quarter, and eighth notes.

The Learning Through Music unit begins by exploring what is assumed as self-evident, and then in later lessons other suppositions are introduced. In all phases of the unit, students investigate fundamental concepts shared between music, math, and other disciplines through the five fundamental processes discussed above. Accordingly, Abner Baez structured lessons that challenged his third grade students to experience and to express their understanding of musical representations of ratio and proportion through listening, questioning, creating, performing, and reflecting on music.

CLCS THIRD GRADE TEACHER PORTFOLIO EXHIBIT: Reflections and Artifacts from Heather Katz's Learning Through Music Portfolio

"Education is not the filling of a pail, but the lighting of a fire."

--A quotation from William Butler Yeats that Heather Katz inserted into her CLCS Teacher Portfolio

Heather Katz came to the CLCS as a new teacher in 2001. Fresh from having received her Master's in Education at the Harvard Graduate School of Education, she was eager to learn about the Learning Through Music Program with her col-

leagues at the school. The following excerpts from her portfolio provide considerable detail as to the kind of professional development outcomes that prepare classroom teachers to incorporate the principles and practices of Learning Through Music.

Required elements of a Professional Development Portfolio became occasions for evaluating classroom teachers' reflective understanding of Learning Through Music guiding principles of music and music-integrated teaching and learning. In this opening statement (CLCS Classroom Teacher Portfolio Artifact 1), Heather Katz establishes an important synthesis between her personal philosophy as a classroom teacher and the LTM program. She also expresses her commitment to documentation and evaluation of student work and to reflections as significant aspects of her professional responsibilities as a laboratory school teacher.

CLCS STUDENT PORTFOLIO EXHIBIT: Guiding Principles of the Student Work Portfolio Process

One of the products of the NEC Research Center collaboration with the CLCS was the establishment of a CLCS student portfolio system that made available evidence of learning from multiple sources. Thus, the portfolio system required rigorous standards of data collection and annotation (dated and labeled as modeled, peer, or independent work) as well as multiple rubrics for various categories of student process and content-based learning.

An essential ingredient of the learning through music assessment process at the CLCS is the collection, evaluation, and public presentation of student work. The portfolio process thus becomes the central point and clearing house for evidence of learning—the most important product of a public school. The portfolio process is not just a research project added on to the teaching responsibilities of a laboratory school, but a validation of the essence of the school's mission in public education.

At the CLCS, the portfolio process provided a close-up view of how music can enhance learning across the curriculum. As participants in the CLCS "portfolio culture," teachers gathered various kinds of student work (and related documentation of assignments and observations) necessary to provide evidence of:

- *Engagement* (first steps) in new levels or forms of learning;
- *Progress over time*: pre-post work that will show improvement in the same areas of assessment (e.g., essay writing, music notation of songs, similar problem-solving tasks);
- *Achievement* of high standards of academic, social-emotional, and musical development;
- *High standards of interdisciplinary learning* (Academic Enhancement Lessons, Thematic Interdisciplinary Project Work based on Shared Fundamental Concepts among disciplines); and

- *Five Process Learning* (i.e., the distribution of learning processes in the curriculum as well as the critical learning "traits" and "habits of mind" that the CLCS values in its graduating students).

As the portfolio process unfolded throughout the school year, teachers were urged to share their examples of student work, discuss their assessment methods, and work together to make the portfolio system a clear and valuable ingredient of the school's accountability to students, parents, colleagues, and school visitors and evaluators. The Exemplary Portfolio Conference became a joyous and much anticipated "culminating event" at the CLCS, as students demonstrated their ability to reflect on their learning and to see how their work could exhibit qualities of learning recognized by those outside of the classroom.

The systematic and careful attention given to the portfolio process ensures that as students become reflective learners over time, teachers also are valued as reflective practitioners in the CLCS learning environment as well.

THE RUBRICS CUBE SYSTEM SUGGESTS THAT THE UNDERSTANDING OF CONNECTIONS AND LEVELS OF QUALITY AMONG FACTORS OF CURRICULUM DESIGN, TEACHING, PRE-PROFESSIONAL TRAINING, STUDENT WORK DOCUMENTATION, AND PROFESSIONAL DEVELOPMENT OUTCOMES WILL BEST EXPLAIN CHANGES IN STUDENT ENGAGEMENT, PROGRESS, AND ACHIEVEMENT. THUS, EXCERPTS FROM THE TEACHER 'PROFESSIONAL DEVELOPMENT/PORTFOLIO' PROVIDE CONTEXTUAL INFORMATION FOR EXAMINING EVIDENCE OF MUSICAL AND ACADEMIC PROGRESS THE STUDENTS MADE DURING THE FIRST THREE YEARS OF THE CLCS.

CLCS MUSIC TEACHER PORTFOLIO

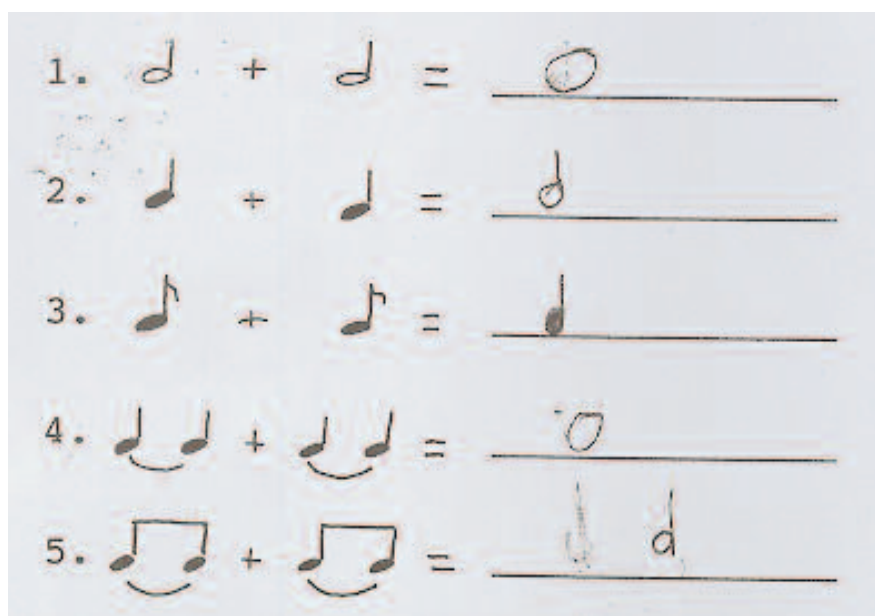
Introduction to the Music Specialist Professional Development Portfolio

With eight years of experience as a music teacher, I have never enjoyed teaching as much as I did this year at the Conservatory Lab Charter School. Teaching at the CLCS has been a learning experience. Through this school year (2001-2002), my horizons have been expanded as I have grown as a teacher and as a professional.

In this portfolio you will see the different aspects and areas of the music teaching in the school (CLCS). In order to accomplish the Learning Through Music philosophy, we have different types of lessons that we did through the year. The lessons are: in Class Assembly, Academic Enhancement Lessons (AEL), Thematic Interdisciplinary projects (TIP), Whole School Assembly and the regular Music Class. All of these lessons combined will help the student to achieve stronger skills in music and its connection with academic classes. You will see some of the lesson plans and assessment of student work as well as some other aspects of the school life such as, concert programs, original opera, photos and examples of other activities.

ARTIFACT 1

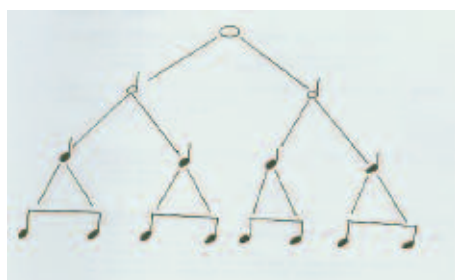
Introduction to the Portfolio



ARTIFACT 2

Music-Math Investigation 1

The axiomatic basis for reading rhythm notation



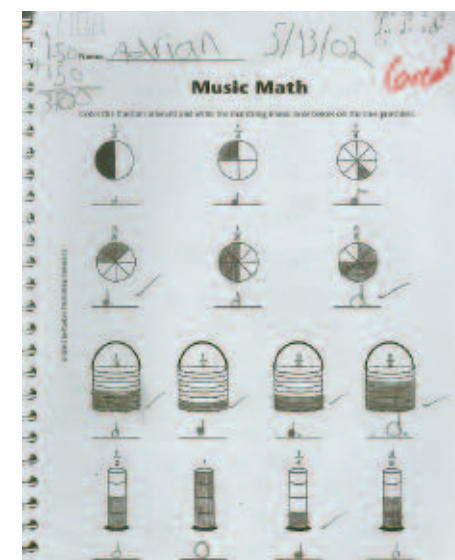
Expanding on the axiomatic understanding of musical duration, students are challenged to demonstrate a more algebraic understanding of math-music equations that could be understood in music reading as proportion or ratio. Starting with the simple music-math example in Portfolio **Artifact 3**, Baez asked students to investigate and verify music-math equations by dividing the class into two parts and comparing the amount of time it takes to perform (clap or sing) either side of the equation.

In Portfolio **Artifact 4**, student responses to music-math worksheets demonstrate understanding of musical and visual-geometric representations of proportion, ratio, or fractions.

ARTIFACT 3

Music-Math Investigation 2

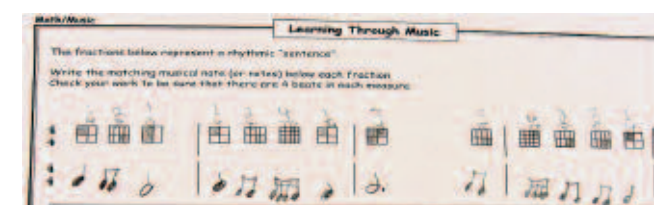
Music-Math Equations (Doubles)



ARTIFACT 4

Music-Math Investigation 3

Multiple Representations of Proportion, Ratio, Fractions



ARTIFACT 6

Music-Math Investigation 5

Sample Music-Math Post-Test

The skill of setting words to music is an important feature of the Creating Original Opera program at the CLCS. The complexities of text setting involved sophisticated problem-solving skills that, by necessity, engaged mathematical (proportion, duration), linguistic (syllable scansion and meaning) and musical (expression, contour, accent, sung vowels, rhythm patterns, etc.) understanding. Student work guided by Abner Baez, NEC faculty member Rhoda Bernard, and NEC Guided Interns (such as composer Julia Carey featured in Part I of this Journal) yielded examples of what could then be termed occasions for developing language-math-music problem-solving skills. Portfolio **Artifact 5**, when explored also through music listening and performance skills, demonstrates an enriched understanding of language prosody and meaning in relation to musical proportion, accent, and pitch contour patterns.

After culminating events such as the Creating Original Opera project were completed, post-tests were used to find out to what extent students had increased their grasp of math concepts shared with music. Abner Baez's student portfolios contained examples of post-tests similar to the example in Portfolio **Artifact 6** that were designed to capture the students' ability to demonstrate multi-symbolic representations of proportion, ratio, and duration as math-music 'sentences.'

From the RUBRICS CUBE viewpoint described previously, the student work documentation samples featured in the music specialist's professional development portfolio serves as evidence of student learning in both music and math. From Abner Baez's point of view, these same examples also serve as evidence of professional development outcomes that suggest his evolving understanding of how to 'teach for transfer' through the design and implementation of his music-math investigations.



ARTIFACT 5

Music-Math Investigation 4

Understanding the Role of Rhythmic Patterns (Proportion-Word Segmentation) in Setting Text to Music

CLCS CLASSROOM TEACHER PORTFOLIO

OPENING PERSONAL STATEMENT:

I believe that children should be active participants in their learning and the structure of the classroom. In my experience, students learn best when lessons are cooperative, hands-on, and interdisciplinary. Our class participates in classroom centers, 'them-based' learning, and creative, interactive learning.

The organization and structure of my teaching portfolio reflects the guidelines and standards of the school, Thematic Interdisciplinary Plans, curriculum documents, and reflections on each of these components. Additionally, it includes a section on student assessment and a reflection on the teaching goals I set at the beginning of the school year.

ARTIFACT 1

Heather Katz's Opening Personal Statement

PERSONAL GROWTH AND PROFESSIONAL DEVELOPMENT THROUGH ADAPTING 'FIVE PROCESSES' AND 'SHARED CONCEPTS' APPROACHES TO TEACHING PRACTICE

As a new teacher at the Conservatory Lab Charter School, learning how to teach according to the Learning Through Music model was an exciting challenge. This learning started during our summer institute in August, during which teachers and staff were taught about the five processes: Listening, Questions, Creating, Performing, and Reflecting, and fundamental concepts shared across disciplines. Keeping these five processes and concepts in mind, I created lessons in collaboration with LTM coordinator Rhoda Bernard, my assistant teacher, and with the music specialist. Each month, we taught many such Academic Enhancement Lessons, and the collection in my portfolio offers a glimpse of the learning using music that went on in our third grade classroom. We made sure to develop and teach lessons in all disciplines to augment student learning in core academic subjects.

Overall, I felt that these lessons were fun and enticing ways for all students to experience and learn more about a familiar subject in a new way. If I were to continue teaching at this school next year, I would work to plan even more lessons using music that were seamlessly integrated into the curriculum. Often these Academic Enhancement Lessons connected directly with what we were learning in class, but they were not as fully integrated into the curriculum as I would like it to be.

At the beginning of the school year, I taught a lesson on the five processes. The class and I created a chart of these words, and we brainstormed a list of synonyms for each one. This chart was posted in our classroom all year. It served as a reference and reminder of ways that we used LQCPR every day. If I have the opportunity to continue working as a teacher at the CLCS next year, I would work to make the five processes a more seamless part of instruction by writing the processes we were using on the board during most lessons and asking students to think about which learning process they are using most frequently throughout the day. I think that if this were achieved, the students would benefit even more from the music integration lessons and the important dual-purpose lessons that they offer.

ARTIFACT 2

Reflection on Personal Growth

Heather Katz's reflection in Portfolio Artifact 2 on her personal growth as a teacher provided powerful testimony of the benefits of systemic implementation of music-integrated instruction in the classroom. According to Ms. Katz, the 'five processes' and 'shared fundamental concepts' approaches to curriculum and instruction provides a wider palette of experiences that proved to be more enticing for the students. She also asserts that in the future a more seamless and far-reaching integration of musically shared concepts should be built into the curriculum.

Learning Through Music classroom and music lesson plans at the CLCS followed the guidelines framed in the 'academic enhancement' lesson plan example in Portfolio Artifact 3. The emphasis on a set of common processes assured that teaching for learning transfer strategies would include aspects of listening skills, inquiry methods, creativity, performance, and reflective understanding in order to provide multiple strands of evidence of music-language integrated learning. The explicit focus on fundamental concepts shared between music and language arts assures that music integration lessons provide opportunities to explore learning standards from 'dual' perspectives. In this example, the process-rich investigation of 'main idea and supporting details' in language arts and music becomes the central focus of this Learning Through Music lesson.

LTM Academic Enhancement LESSON PLAN (Unit)

(independently or collaboratively designed and implemented by either academic or music teacher)

Classroom or Music Teacher: Katz/Sholtens_ Date: 6/5/02 (reformatted/ revised 2004)

Grade Level __3__ Subject Area(s) __Writing and Music__

- ◆ Goals
- ◆ 5 Process Cognitive Skill Focus
- ◆ Shared Fundamental Concept Focus
- ◆ Resources
- ◆ Sequence of Events
- ◆ Artifacts
- ◆ Assessment

Lesson Title: Main Idea and Supporting Details in Writing and Music

List Goals:

- To connect a composer's use of melodic ideas to writing main ideas in paragraphs
- To reinforce the definition of main idea and supporting details
- To learn about how good writers in music and language arts write main ideas and support them with details
- For student highlight the main idea/melody in a piece of music to show what they learned

List Chosen Shared Fundamental Concept Focus

- Listen/Perceive: listen for structure and detail in Mozart String Quartets
- Question/Investigation: What are indications of main ideas and supporting detail in music and language arts literature?
- Create/Invent: Students create graphic representations of musical and literacy structure, mapping themes, main ideas and details
- Perform: Demonstrate understanding of main ideas and details in musical analysis tasks
- Reflection: Reflective writing in Listening Journal

List Chosen Shared Fundamental Concept Focus (Language Arts-Music-Math)

- Writer's, Composer's craft – main ideas/musical themes and supporting details
- Themes, Patterns – identify and quantify how main ideas/melodic themes are used in music and writing
- Form/Structure – thematic structure as pattern recognition; beginning middle and end in composition

List Resources Needed

- Sheet music copies and CD of Mozart's String Quartet in C, K. 157
- Highlighters and pencils

ARTIFACT 3

'Main Ideas and Supporting Details' in Music and Language Arts

List Sequence of Activities within Unit (over several days):

- The teacher will review the concepts of main idea in writing and reading
- Student will be asked to define main idea and what we've learned about it in our writing lessons
- The teacher will then tell the class that we are going to learn about main ideas using a string quartet by a classical composer
- Pass out a copy of the music to each student
- The students will listen to a small segment of the first movement. The teacher will point out the main melody to the class and ask them to listen for it while they listen to the quartet movement; [Pre Test: children are asked to raise their hands when they hear the melody throughout the first movement]
- The class will then be asked to follow along with their fingers as they listen to the music
- We will then look again at the melody on the board, hum it together, name the notes it starts on and generally become familiar with it
- Next, student will be asked to work with a classmate at their table group and highlight this melody whenever they see it repeated in the musical score
- When students are finished, the teacher will ask how many times the melody repeated, and students will raise their hands and volunteer where it repeats by naming the page it is on and what measure it is on
- After the class names all of the repeating measures with the melody, the class will then be asked what the purpose of the other notes in the rest of the quartet is [What are supporting details in music?]
- Since we've been studying main ideas and supporting details, I will ask for volunteers to talk about and identify and circle supporting details in the music [What is the pattern of the theme, what are patterns of supporting details?]
- We will then talk about how all good writers and composers write a catchy and noticeable main ideas, or melody, and then support it with details, just like Mozart did and they do it their own writing.
- All children will be asked to identify another theme in peer group and then on their own, and to circle supported details.
- Post test: children are asked to raise their hands when they hear the main theme (with eyes closed), teacher stops the CD and asks the student where the theme is and what supporting details there are in the score.
- To conclude the lesson plan sequence (unit), students will review what main ideas and supporting details mean, and the teacher will remind them that they can think of this lesson when they are writing during writer's workshop this month [reflection sheet: What are similarities between musical themes and details and main ideas and details in writer's workshop?]

List Chosen Learning Artifacts

- Pre-Post Observation of participation in class discussions and sharing of location of the melody
- Music score with highlighted melodies and supporting details
- Reflection sheets on inquiry questions

Describe Assessment Process and Expected Results

- Contribution to the class discussion
- The ability to locate and highlight the melody in the musical score
- Evidence of Understanding of parallel processes that links main idea and supporting details in both music and writing
- Reflection on musical structure and supporting detail during writers workshop

The description of lesson implementation, the collection of student work 'artifacts,' and assessment processes shown here provide a detailed look at the challenges and potential rewards of music integration lessons. Rigorous assessment of student work provides evidence of causal links between music and language arts instruction and its relationship to learning outcomes in either discipline.

CLCS CLASSROOM TEACHER PORTFOLIO



ARTIFACT 4
'Main Ideas and Supported Details'
Student Work Sample

Closing Personal Statement

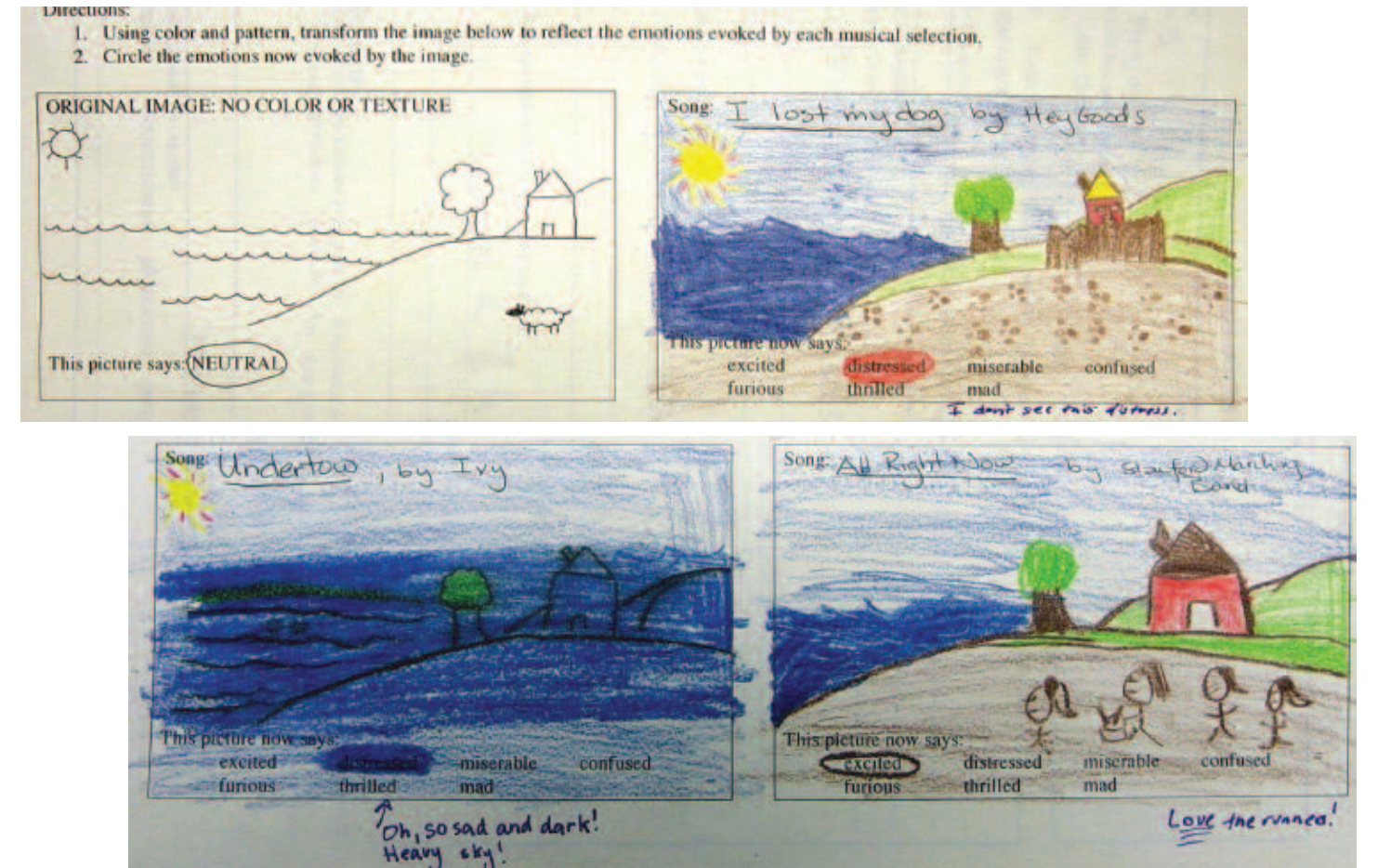
As a teacher at the CLCS, I gained irreplaceable knowledge and had experience that I could not have anywhere else. This school and its mission are very unique, and having the opportunity to serve on the staff here has been wonderful. As a professional teacher, I gained skills, and learned methods of instruction and ways of teaching using music that I can take with me to new jobs at new schools. Though my time here was short, I could not have asked for a richer, more rewarding experience.

ARTIFACT 5
Heather Katz's Closing Statement

In Portfolio **Artifact 4**, a third grader demonstrates that he has learned to draw and support his own conclusions about main ideas and supporting details in music by listening and marking the score.

The CLCS laboratory school program provided opportunities for teachers to collaborate with peers in order to invent curriculum and student assessment methods according to rigorous standards of music-integrated learning guided by NEC faculty and researchers. In the closing statement in Portfolio **Artifact 5**, Heather Katz reflects that the professional development, staff support, and collaboration with peers she experienced at the CLCS transformed her teaching practices; in fact, she feels that these new practices will remain essential to her even if she teaches in other schools not necessarily dedicated to learning through music.

CLCS STUDENT PORTFOLIO



ARTIFACT
Reflections on 'Music and Emotion'

The CLCS Student Portfolio **Artifact** shown here provides a glimpse into the CLCS portfolio system.

Portfolio documentation of music-integrated lesson work was assessed by teachers and by a team of NEC researchers at the end of the school year. The assessments provided teachers with ways of identifying exemplary work for their teacher portfolios and also with a source of data to be compared with other aspects of the school assessment or standardized test scores. The analysis of this example served as an exemplar for scoring student portfolio work in terms of five process-based learning at the CLCS:

Listening: Significant evidence of perceptive listening comes in the form of detailed representations of the song. The teacher acknowledges the heavy, dark mood of the "Undertow" and the excitement of running in "All Right Now." The teacher notes that the top right "I lost my dog" captures the sense of the music, though it does not depict the emotion of 'distress.'

Questioning/Investigative: The clearest evidence of questioning or investigation are the 'footprints' in the drawing that suggest how the lost dog can be found.

Creative/Imaginative: The examples show a fair measure of creativity and imagination in portraying an emotion and drawing a corresponding picture. The drawings are highly contrasting, employing inventive ways of depicting gloom (as a result of distress?) and the excitement of running.

Performer/Demonstrator: The student believes she is demonstrating an understanding of the connection between emotion and music.

Reflective: There was no documentation of reflective thinking included in this assignment. Nonetheless, evidence of reflection is implicit in the student's ability to contrast moods in the drawings in relation to each song.

DATA ANALYSIS EXHIBITS

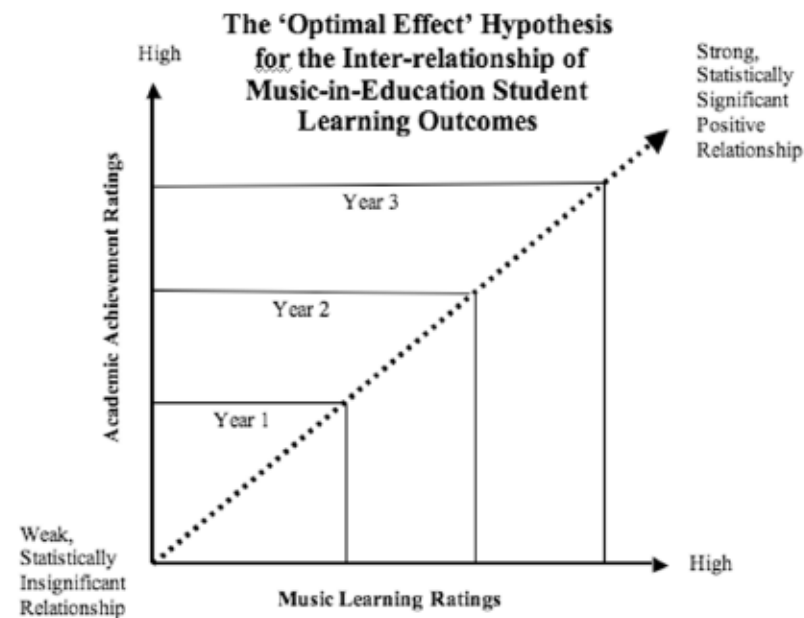
The previous exhibits illustrate prototypical aspects of the RUBRICS CUBE System in terms of qualities such as curriculum design, teaching practices, teacher professional development outcomes, and documentation of student work [see RUBRICS CUBE Program Evaluation Outcomes 2-5 in previous article]. The following examples demonstrate how student academic, music, and music-integrated learning outcomes can be analyzed, displayed, and employed to further the institutional advancement of a laboratory school and contribute to research in the field of music-in-education [RUBRICS CUBE Program Evaluation Outcomes 6-8].

EXHIBIT 1

The Conceptual Framework for the Optimal Interaction Between Music and Academic Skills Assessments Over Time

THE MUSIC-IN-EDUCATION OPTIMAL EFFECT HYPOTHESIS

The data display below illustrates a three-pronged strategy for measuring the possible 'optimal effect' of a laboratory school 'learning through music' program: (1) measure changes in academic achievement [vertical axis], (2) measure changes in music learning [horizontal axis], and (3) measure the 'strength of correlation' between these two previous factors over time [the degree of the positive relationship between both learning outcomes].



The positive confluence of these three factors supports the 'optimal effect' hypothesis for learning outcomes in a laboratory school music-in-education partnership. As illustrated, if improvement of student academic achievement outcomes occurs at the same time music learning outcomes increase AND there is an increasingly strong, positive and statistically significant correlation between these two factors, these findings would support the hypothesis that learning transfer between these subjects areas has likely occurred in the context of authentic, comprehensive and interdisciplinary 'learning through music' teaching practices.

EXHIBIT 2

The Music-in-Education School Performance Rubric

The matrix below frames four broad CLCS program outcomes according to the Music-in-Education School Performance Rubric. Note that only the top left box in the matrix supports the 'optimal effect' mission of the Learning Through Music laboratory school program.

		Music Learning Outcomes	
		+	-
Academic Performance Outcomes	+	ACADEMIC, MUSIC & MUSIC INTEGRATION SUCCESS <ul style="list-style-type: none"> The school is increasingly able to meet or exceed both academic and music learning standards. Increasingly strong, positive and statistically significant relationships between academic and music learning outcomes over time indicate that the music integration aspects of the music-in-education program has succeeded and that the optimal effect hypothesis has been confirmed. 	ACADEMIC SUCCESS, MUSIC LEARNING & MUSIC INTEGRATION FAILURE <ul style="list-style-type: none"> The academic program is succeeding, but the music program is failing; thus, the music integration curriculum is limited in its relevance or effectiveness. The correlation between music and music learning may be weak, statistically insignificant or irrelevant.
	-	MUSIC LEARNING SUCCESS, ACADEMIC & MUSIC INTEGRATION FAILURE <ul style="list-style-type: none"> The music program is succeeding, but the academic program is failing; thus, the music integration curriculum is limited in its relevance or effectiveness. The correlation between music and music learning is weak, statistically insignificant or irrelevant. 	MUSIC AND ACADEMIC FAILURE <ul style="list-style-type: none"> School is failing to meet measurable goals aligned with both academic and music standards; The correlation between music and music learning is irrelevant.

MUSIC-IN-EDUCATION SCHOOL PERFORMANCE RUBRIC

Note also that results displayed in the following data exhibits present evidence of improvement and coherency of music and academic outcomes that are consistent with the 'optimal effect' hypothesis as framed and categorized in the previous two figures.

EXHIBIT 3

Three-Year Longitudinal Analysis of Averaged Rhythm and Pitch Music Reading Skills Related to Stanford 9 Verbal Reading Skill Scores (Grades K-4)

ANALYSIS IN TERMS OF THE OPTIMAL EFFECT HYPOTHESIS

Step 1: Academic Skill Analysis.

According to the chart below, we see that the 'blue' sections of the pie charts are getting larger over time. Since the blue sections indicate the percentage of students across all grade levels who are scoring above the 50th percentile in Stanford reading tests, we can conclude that academic performance has improved significantly, especially in the third year.

Step 2: Music Skill Development Analysis.

These graphs indicate that both rhythm and pitch (and melodic) literacy skills, as indicated by the solid and near solid textures, increased in sophistication in both the second and third year. Note that increasingly sophisticated musical literacy skills—as measured by highest levels of achievement in listening, performance, improvisation, reading, error detection, dictation, and composition tasks in the NEC Music Literacy Skills Test—predated the dramatic improvement in academic ratings in the third year. Overall, the relatively homogeneous levels of pitch and rhythm performance skill in the third year suggest a school culture of musical literacy and its positive association with academic performance.

Step 3: The Relationship between Academic and Music Skill Development Analysis.

The relationship between verbal reading and rhythm reading is statistically significant in all of the first three years of the CLCS Learning Through Music program, indicating that the relationship between music literacy and math basic skills are associated and perhaps intrinsically related to musical skill development.

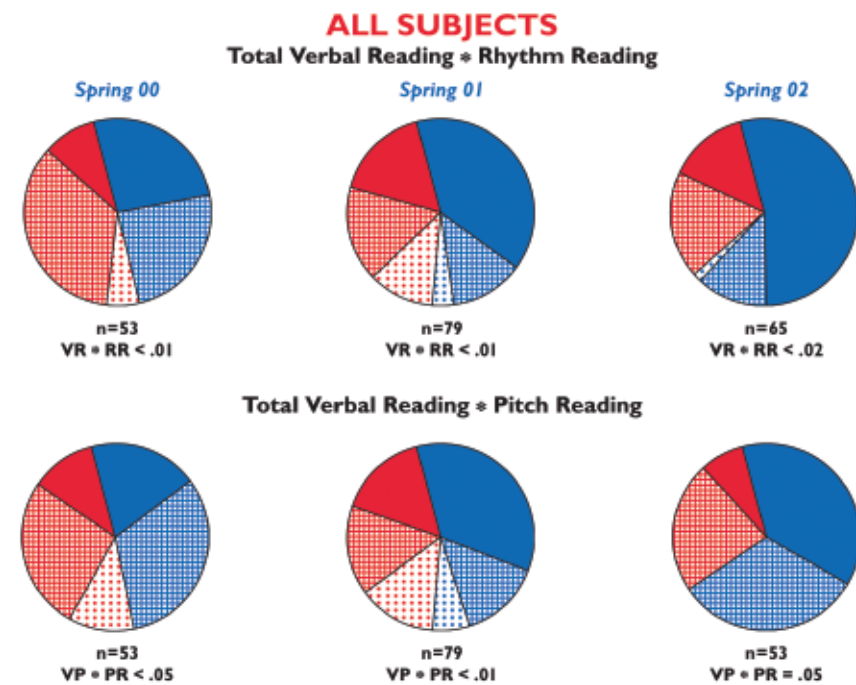


Figure 1a

IMPLICATIONS

The correlations indicate a significant relationship exists between these two domains throughout the three-year period, indicating that when students learn to read music well they are more likely to rate highly in language reading skills; and conversely, when students do not read music well, their language skills are more likely to suffer accordingly.

EXHIBIT 4

Evidence of Cohort Differences in Academic Achievement According to the Initiation Point and Degree of Program Participation (Spring 2001 - Spring 2002)

The table below provides more detailed evidence of academic progress in both reading and math as indicated by Stanford 9 test results:

- I. All Students at the CLCS show statistically significant improvement from 2001-2002 in READING and MATH;
- II. The cohort of students who have been with the CLCS more than two years show higher test scores in READING and MATH; and
- III. Those students who have been with the CLCS two or more years starting with Kindergarten or First Grade show the highest levels of development and improvement in READING and MATH.

Percent At Or Above 50th Percentile of Stanford Achievement Ratings

STUDENTS	READING		MATHEMATICS	
	2001(k-3)	2002(1-4)	2001(k-3)	2002(1-4)
I. All Students at the CLCS continuing and progressing 2001-2002 (N = 68/80)	55.7	72.1 **	47.8	62.3 *
II. Students with more than 2 years of LTM program (N = 53/60)	60.4	78.8 **	52.8	67.9 *
III. Students with 2 or more years of LTM program who started at K or 1 (N = 41/60)	65.9	90.9 **	61.0	80.5 **

The data display summarizes improvement in Academic Skill Test Scores in Reading and Mathematics at the CLCS during the years 2-3 of the CLCS according to three strands of cohort analysis (*p<.05; **p<.01).

IMPLICATIONS

The cohort analysis of changes in academic performance over the first three years of the Learning Through Music Program indicate clearly that the sooner and longer students are exposed to authentic, comprehensive, and interdisciplinary music education at the CLCS, the better they will perform on both language arts and math standardized tests.

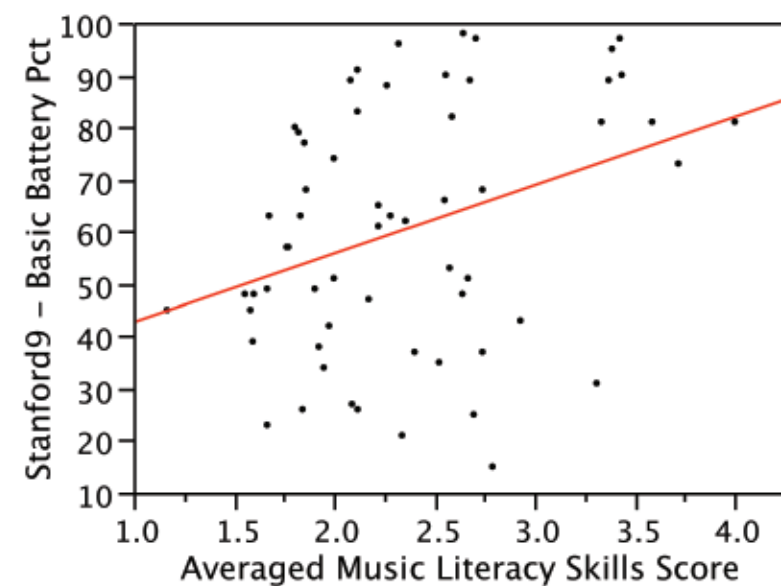
EXHIBIT 5

Student Cohort Differences in the Strength of Association between Academic and Music Learning Outcomes

In the fourth year of the CLCS program, NEC researchers looked at the cohort analysis from the point of view of a quasi-control group study. That is, we looked at the suddenly larger influx of transfer students into the CLCS as an opportunity to determine differences in the 'degree of correlation' between students who began with the CLCS and who stayed for at least two years (*full treatment students*), and those who had not (*partial treatment students*). The hypothesis was that the 'degree of correlation' would best indicate the extent to which students achieved an integrative understanding of music, math, and language skills.

The findings charted below capture the significant differences between the two cohorts. The first chart shows that for the partial treatment group, the correlation between averaged academic and music learning skills is weak, though statistically significant.

Control Group (partial treatment) Cohort Profile of the Relationship Between Music Learning (averaged) and a basic battery of standardized reading and math test scores (averaged), Conservatory Lab Charter School, K-5, 2003.



IMPLICATIONS

For students who have not received the full effect of the laboratory school program, the 'learning through music' effect of the increasingly strong relationship between music and academic learning is *beginning* to take place, as indicated by a relatively weak, though statistically significant bivariate fit between averaged music and academic test scores.

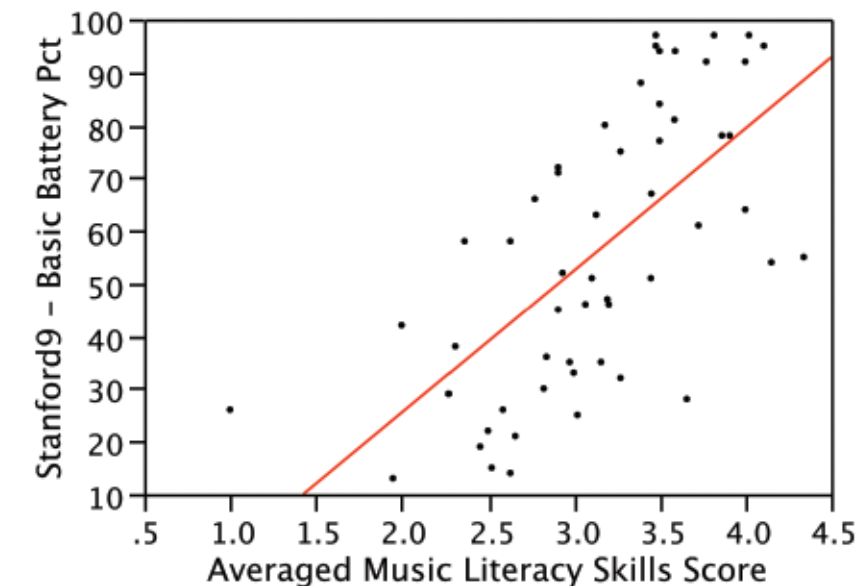
As seen in the next data display, those students who received the full benefit of a Learning Through Music program project a very different profile of music connection to other areas of learning in the context of music-integrated instruction.

EXHIBIT 6

Comparison Experimental Group (full treatment) Cohort Profile of the Relationship Between Music Learning (averaged) and a basic battery of standardized reading and math test scores (averaged), Conservatory Lab Charter School, K-5, 2003.

For students who have received the full benefit of the CLCS-NEC 'Learning Through Music' program, the data show extremely strong patterns of correlation. Comparing this data display (Figure 20 below) with the previous scatterplot (Figure 19 above) reveals that the *bivariate fit*, the *music learning mean scores*, and the *strength of correlation* measures are significantly more powerful (t ratio = 6.68, $p < .0001$; F Ratio = 44.61, $p < .0001$).

Most significantly, the variance accounted for by the index of correlation indicates a vastly different effect of the full program treatment (r^2 statistic): the control group accounts for only 12% of the variance in test score correlation, while the full treatment group accounts for 43% of the variance. This last statistic suggests an exponentially strengthened association between excellence in music skills and general academic achievement.



IMPLICATIONS

The overall differences between these two cohorts suggest that the optimal coherency of the program takes place after at least two years of program exposure, ideally beginning with kindergarten. This finding provides an important causal link between the powerful associations between music-integrated teaching and learning and academic achievement.

EXHIBIT 7

Measuring the Impact of Music Learning on Overall Academic Achievement Controlling for Non-Curricular Variables

Going beyond paired factor correlations, stepwise regression techniques reveal the relative predictive strength of each contributing variable to a single outcome (Averaged Stanford Basic Battery mean scores). The next to the far right column measures the relative strength of the variable's contribution to academic achievement, the far right column its statistical probability that it could be due to chance.

Judging these two factors, the averaged music literacy score (ML – Total Average, the bottom variable) appears as the most important factor by far in predicting academic achievement in terms of grade level nationally-normed percentiles derived from the Stanford 9 academic achievement test results. Note that the only other positive, yet weak correlations occurred due to grade level effects (attributed to significant differences in teacher success with academic tests) and students designated for special education. Note also that the overall regression model, dominated by music literacy skills, explains over half (54% as indicated by the r^2 statistic) of the variance in academic tests.

Stepwise Regression Analysis of Factors Affecting Academic Achievement at the CLCS, 2003

		SSE	DFE	MSE	RSquare	RSquare Adj	Cp	AIC
		21728.872	73	297.65578	0.5905	0.5400	7.2303793	482.1072
Lock	Entered	Parameter	Estimate	nDF	SS	F Ratio	Prob>F	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Intercept	-20.275323	1	0	0.000	1.0000	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Cohort Designation{0-1}	3.62845857	1	584.38	1.963	0.1654	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Grade{1&2-3&4&5}	1.79799526	3	3561.093	3.988	0.0109	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Grade{1-2}	8.82366777	1	1627.344	5.467	0.0221	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Grade{3-4&5}	6.66770315	1	1803.402	6.059	0.0162	
<input type="checkbox"/>	<input type="checkbox"/>	Grade{4-5}	0	1	6.046592	0.020	0.8878	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Gender{F-M}	-2.4409338	1	462.3892	1.553	0.2166	
<input type="checkbox"/>	<input type="checkbox"/>	Suspensions{yes-no}	0	1	312.802	1.052	0.3086	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Low Income{yes-no}	-4.6325375	1	1280.621	4.302	0.0416	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	LEP{yes-no}	-5.6857253	1	626.3092	2.104	0.1512	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPED{yes-Yes&no}	-7.7470421	1	1985.137	6.669	0.0118	
<input type="checkbox"/>	<input type="checkbox"/>	SPED{Yes-no}	0	1	112.7033	0.375	0.5420	
<input type="checkbox"/>	<input type="checkbox"/>	Violin – Total Average	0	1	253.6604	0.850	0.3595	
<input type="checkbox"/>	<input type="checkbox"/>	ML – Rhythm Average	0	1	34.85109	0.116	0.7348	
<input type="checkbox"/>	<input type="checkbox"/>	ML– Pitch Average	0	1	18.64991	0.062	0.8043	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ML – Total Average	23.4193012	1	9104.68	30.588	0.0000	

IMPLICATIONS

The chart above demonstrates that averaged measures of *Music Literacy Skill*—controlling for gender, social economic status, English language proficiency, special education designation, misbehavior, and teacher (grade level) effects—is the most powerful predictor by far of overall academic achievement at the CLCS in 2003.

Further regression analysis into the subskill factor effects on overall academic achievement revealed *rhythmic composition* and *pitch pattern reading* as the most significant predictors of academic achievement within the average musical literacy skill ratings. Regression models that distinguish between experimental (full treatment) and control (partial treatment) cohorts revealed that *averaged music literacy skill levels* again dominated other non-academic factors for both cohorts and outperformed other measures of school academic achievement.

CLCS CASE STUDY
CONCLUSIONS

This case study is a precursory history of laboratory school practices and research methods that have been formalized and are now being disseminated through the MIENC's Learning Laboratory School Network. In 1998 NEC faculty took on a set of initiatives that resulted in the creation of a music-in-education guided internship program, the development of 'learning through music' programs in several elementary schools, and the creation of a Research Center to manage, document, and assess these laboratory program initiatives.

The Conservatory Lab School, however, became the central focus of these efforts once it was chartered by the state of Massachusetts to create its laboratory learning through music program in partnership with New England Conservatory. In three short years, the CLCS-NEC partnership resulted in curricular and assessment frameworks, as well as student work documentation, assessment methods, and teacher professional development portfolios that served as prototypical components of what is described by the Music-in-Education National

**MUSIC LITERACY SKILLS
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FAMILIES, ENGLISH
LANGUAGE LEARNING
DESIGNATION, OR EVEN
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MUSIC-IN-EDUCATION NATIONAL CONSORTIUM
MEMBERS AS THE RUBRICS CUBE SYSTEM.**

Consortium members as the RUBRICS CUBE system. Abner Baez and Heather Katz, the case study teachers featured in this chapter, as well as teachers published in previous issues of the *Journal*, served as action research partners with NEC faculty and several students who are now full-time faculty at the CLCS. Their teacher portfolios included many artifacts of music and music-integrated instruction and assessment examples that demonstrated methods for 'teaching for transfer' of fundamental concepts and processes shared between music and language and/or math. When the researchers examined the portfolio work carefully, emergent practices suggested that the CLCS-NEC partnership practices were well aligned with the mission of the laboratory school to view music 'as a universal language of learning' that might help students to understand more deeply the connection between dedication to musical training and learning in other areas of the curriculum.

After four years, statistical results from the CLCS Learning Through Music program affirmed the 'optimal effect hypothesis' for music-in-education programs in schools as described in the last section of the case study. That is, as academic and musical skill levels both improved at the CLCS, the 'degree of correlation' among these factors increased substantially for those students who began in kindergarten and stayed with the school for more than two years.

Surprising to many, the regression analyses of various contributing factors to academic learning determined that music literacy skills were more predictive of academic achievement test results than factors such as gender, social economic status of families, English Language Learning designation, or even special education status.

In the next case study, the story continues as the frameworks underlying the 'learning through music' partnership school programs developed through NEC make new connections with a large urban public school in Minneapolis and its resident community orchestra. Like the Conservatory Lab Charter School in its early years, the next case study school provides music instruction to all of its students and is dedicated to the rigorous design and assessment of music and music-integration curriculum. Going beyond the limitations of a small startup charter school, the Ramsey School and its partnership with the Learning Through Music Consulting Group modeled the development of music and arts-integrated learning practices for its public school district, professional development with resident community orchestras, a guided internship program and research initiatives with university partners, and the development of digital portfolio practices and scale-out dissemination initiatives for the MIENC Learning Laboratory School Network. ¶

REFERENCES

- Bamberger, J. (2000). Music, math and science: towards an integrated curriculum. *Journal for Learning Through Music*, I, 32-35. Boston: New England Conservatory [music-in-education.org].
- Davidson, L., Crouch, S., & Norton, A. (2000). Assessment, accountability and learning through music practices: Learning through music portfolios in elementary schools. In Scripp, Davidson, & Keppel, Eds., *Journal for Learning Through Music* (New England Conservatory), Boston, MA (pp. 56-67).
- Rabkin, N. & R. Redmond (2004). *Putting the arts in the picture: Reframing education in the 21st century*. Chicago: Columbia College Chicago.
- Scripp, L. (2002). An overview of research on music and learning. In Deasy, D. (Ed.), *Critical Links: Learning in the Arts and Student Academic and Social Development*. Washington, D.C.: Arts Education Partnership [aep-arts.org].
- Scripp, L. (1998). *Application for the Conservatory Lab Charter School*. Submitted to the Massachusetts Charter School Office in early January and approved by the Massachusetts Board of Education in February 1998.
- Scripp, L., (2003). Critical links, next steps: An evolving conception of music and learning in public school education in Scripp & Keppel, Eds., *Journal for Learning Through Music* (New England Conservatory), Boston, MA (pp. 28-31) [music-in-education.org]
- Scripp & Keppel, Eds. (2003). *Journal for Learning Through Music: What Makes Music Work for Public Education?: Innovative Programs and Research from a National Perspective*. [music-in-education.org]
- Scripp, Keppel, & Davidson, Eds. (2000). *Journal for Learning Through Music issue: Why Integrate Music Across the Elementary School Curriculum?* [music-in-education.org]
- Scripp, Keppel, & Wong, Eds. (2007). *Journal for Music-in-Education I: Advancing music for changing times: Portraits & portfolios of the evolving role of music in education*. [music-in-education.org].
- Scripp, L & Subotnik, R. (2003). Dual directions for innovation in music: Integrating conceptions of giftedness into general educational practice and enhancing innovation on the part of musically gifted students. In L. Shavinina, (Ed.) *International Handbook on Innovation*, Elsevier Science Services, Pergamon.
- Wassermann, D. (2004). You can't get much better than that. In N. Rabkin & R. Redmond (Eds.), *Putting the arts in the picture: Reframing education in the 21st century* (17-48). Chicago: Columbia College Chicago.
- Winner E., Davidson L., & Scripp, L. Eds. (1992). *Arts PROPEL: A handbook for music*. Harvard Project Zero, Cambridge, Mass.
- Wong, R. (2007). Evolution of pre-professional portfolio assessment for New England Conservatory's Music-in-Education Concentration. In Scripp, Keppel, & Wong (Eds.) *Journal for Music-in-Education: Advancing music for changing times: Portraits & portfolios of the evolving role of music in education*. [music-in-education.org].