Chicago Arts Partnerships in Education

Sound Design Project (SDP)
An Integrative 3-year Project Involving
Sound Teaching Artists, Music Teaching Artists, and Classroom Teachers

Figure 1: Sound in Motion exhibit by kindergarten students at Hamilton Elementary.

2014 - 2015
Final Research and Program Evaluation Report

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Introduction

As a leader in school improvement and change through the arts, Chicago Arts Partnerships in Education (CAPE) was founded in 1992, grounded in the principle that developing and sustaining collaborative relationships and partnerships with artists, arts organizations, CPS school leaders, and funding agencies, would enable them to work "toward a future in which young people are empowered, through education and the arts, to fully realize their academic, creative and personal potential" (CAPE, 2016). CAPE realizes this vision using research-based arts driven education and contributing to knowledge in the field by conducting their own research in order to build teacher and teaching artist capacity, improve school effectiveness, and increase students' academic successes.

CAPE provides arts integration programming during in- and out-of- school times, a partnership between CAPE teaching artists and school classroom teachers. Although CAPE has various funding sources that support their many programs, their arts integration projects are centered on developing students' academic and social skills such as critical thinking, creativity, and collaboration. CAPE's more than 50 teaching artists are practicing artists in various arts media including visual arts, theater, music, dance, and media/communication arts.

Inquiry, documentation, professional development, and collaborative research are CAPE's four key research methodology components. However, central to CAPE's research and organizational methodology is inquiry. Inquiry questions are used by teachers and teaching artists to guide their arts integration curriculum. They continuously reflect and revisit them throughout the project in order to delve deeper into the subject matter and view it more critically as teachers and as students. CAPE inquiry questions are not only of student academic achievement and looking across grades, schools, or programs, but they are questions that help them more deeply understand the impact of teaching and learning through art; questions that help

teachers learn more about their own teaching; questions that help teaching artists learn more about teaching their art and about themselves as artists; and questions that help them learn how to bring about effective, systemic and cultural changes to schools.

CAPE provides professional development (PD) to teachers and teaching artists tailored for each program, where teacher/artist teams across schools gather several times throughout the year. In these multi-purpose sessions, teachers and teaching artists may share about their projects, program evaluation and project inquiry questions may be discussed, and the topic of conversation may be research findings – either of the program itself or action research related to the individual projects and their inquiry questions – and reflecting upon these findings. Additionally, CAPE's professional development includes training for teachers and teaching artists in documentation methods.

Each teacher/artist team is required to document their project throughout the process, from the beginning, through the middle, and to the end. Starting with curricular planning and the identification of inquiry questions, documentation is organized from the onset and the data gathered are presented via portfolios, documentation panels, and on-line digital formats. CAPE teachers and teaching artists train to use different methods for documentation including photos, video, audio recordings, interviews, and reflection writing and journaling. These combinations of documentation sources provide a rich set of data for the teachers and teaching artists to see the progression of their projects, enabling them to reflect back on what occurred and make changes where necessary. Additionally, the researchers examine the data and provide an external perspective of CAPE's programs and the impact of that programming.

CAPE works with external, university-based researchers in order to gain a broader perspective on what is happening in CAPE partner schools. Research plans, tools, and instruments for data analyses are sometimes created collaboratively. The researchers report back

to CAPE staff and teacher/artist teams on their results regarding the program impact on students, teachers, teaching artists, and/or schools, and offer recommendations for further improvement. As a learning organization, CAPE uses inquiry, documentation, professional development, and collaborative research to bring about school improvement and change through the arts.

Program Overview

The Sound Design Project (SDP) is CAPE's initial 3-year program which investigated the links between sound and music instruction. Teachers and teaching artists experimented with the interconnections between sound arts, music pedagogy, and academic learning, thus creating unique interdisciplinary curricula for students. During the SPD, CAPE consulted with sound artist Lou Mallozzi, School of the Art Institute of Chicago (SAIC) professor and Executive Director of Experimental Sound Studio. This collaboration helped to ground the project in an experimental design which leveraged sound arts as a means of assisting teachers and teaching artists in developing and implementing their own interdisciplinary curriculum. Together, CAPE staff and Lou Mallozzi created a framework for the professional development workshops that were conducted throughout the three-year period of the project implementation.

SDP involved four schools, two classroom teachers from each school who taught a variety of academic disciplines, and two partner artists at each school – one music teaching artist and another teaching artist with an experimental approach to music and/or sound. The four schools involved in SDP and in this study were:

1. Alcott College Prep
2. Alice L. Barnard Computer, Math, & Science Center Elementary
3. Hamilton Elementary
4. Inter-American Elementary Magnet School

Research and Evaluation Design

The Sound Design Project (SDP) program evaluation was designed as a small case study. This approach provides an ideal opportunity to see and hear about the impact of this kind of work from teachers and teaching artists. If arts integration is ever to make a profound impact on students, then it is necessary to hear from their teachers—those who are directly charged with increasing and developing students' knowledge, capacities, and thinking skills. This design also provided an opportunity to highlight one of the projects in the program in order to better understand and disseminate, in greater detail, the particulars of an interdisciplinary curriculum that addressed sound arts, musical learning, and academic disciplines in a model unit of study.

Three evaluation questions were identified and addressed in this evaluation. These inquiry questions were:

1. In what ways are teachers impacted by the arts integrated project taught by a collaborative team of a music teaching artist, a sound teaching artist, and a classroom teacher?
2. In what ways are students impacted by the arts integrated project taught by a collaborative team of a music teaching artist, a sound teaching artist, and a classroom teacher?
3. How does the combined teaching of sound and music in an arts integrated project impact the classroom environment?

This evaluation includes data collected during all three years of program implementation. Although the number of projects in each school varied from year to year, SDP involved four schools in the Chicago Public Schools – Alcott, Barnard, Hamilton, and Inter-American. In the second year of the program, six teaching artists, and six classroom teachers participated in the evaluation. During the third and final year of SDP, two other classroom teachers participated in

the program evaluation bringing the total to eight classroom teachers that year. In this program evaluation, data were gathered from all 14 teachers and teaching artists (see Table 1).

Table 1

Sound Design Project Data Collection: Number of Classroom Teachers and Teaching Artists Participants

Name	Year 2: Number of Respondents	Year 3: Number of Respondents
Classroom Teacher	6	8
Music Teaching Artist	3	3
Sound Teaching Artist	3	3
Total	**12**	**14**

The data for this program evaluation included qualitative data from several sources collected during years 1, 2, and 3 of SDP. In Year 3 of SDP, quantitative survey data were also collected from classroom teachers and teaching artists. These data sets include:

- Professional Development Agendas (Years 1, 2 and 3)
- Notes from Professional Development Sessions (Years 1, 2 and 3)
- Teacher and Teaching Artist Surveys from Professional Development Sessions (Years 1, 2, and 3)
- Teacher and Teaching Artist Planning Forms (Years 2 and 3)
- Teacher and Teaching Artist Demographic Data (Year 2)
- Teacher and Teaching Artist Surveys and Reflection Questions (Year 2)
- SDP Online Digital Portfolios of Teacher and Teaching Artist Project Planning, Implementation, Student Learning, and Reflections (Years 2 and 3)
- PD Observation of Year 3 Session 3 on 5.11.15
- Classroom Observations in Year 3: Inter-American Magnet on 5.12.15

- Teacher and Teaching Artist Focus Group Interviews (Year 3)
- Individual Interview with Collaborating Sound Artist Lou Malozzi on 5.12.15
- Teacher and Teaching Artist Musical Learning/Arts Integration Survey (Year 3)

A combination of data sources were used to address each research question in this SDP evaluation. The data used to support research question #1, about the program's impact on teachers, came from the online digital portfolios, professional development (PD) surveys, planning forms, focus group interviews, individual interview, and survey/reflection questions from year 2. Research Question #2, about the program's impact on students, was addressed using data collected from the online digital portfolios, planning forms, focus group interviews, and surveys from years 2 and 3. Finally, the survey/reflection questions from year 2 and the focus group interviews from year 3 were the main source of the data used in addressing Research Question #3, which dealt with the program's impact on the classroom environment.

CAPE offered four professional development sessions in each of the three years of SDP. Agendas, notes, and PD surveys from these professional development sessions were gathered as data for this evaluation. A total of 11 online digital portfolios were collected, six from year 2 and five from year 3. In addition, 15 planning forms were collected from years 1 - 3 (five in each year). Tables 2, 3, and 4 provide a summary of these data sets collected for this evaluation.

Table 2

Sound Design Project Professional Development Data Collection by Project Year, Type of Data Set, and Date of Origin

Year	Agenda	Notes	Survey
1	11.15.12		
1	12.10.12	12.10.12	12.10.12
1	1.23.13	1.23.13	1.23.13
1	6.3.13	6.3.13	
Total Year 1	***4***	***3***	***2***
2	10.8.13		10.8.13
2	11.13.13	11.13.13	11.13.13
2	12.17.13	12.17.13	
2	5.14.14	5.14.14	5.14.14
Total Year 2	***4***	***3***	***3***
3	10.28.14	9.19.14	10.28.14
3	12.16.14		12.16.14
3	1.20.15	1.20.15	
3	5.11.15		
Total Year 3	***4***	***2***	***2***
Total Both Years	**12**	**8**	**7**

Table 3

Sound Design Project Online Digital Portfolios by Project Year, School, Grade Level, and Collaborative Team

SDP Year	School Name	Grade Level	Sound Design Project Name	Classroom Teacher	Teaching Artist (music)	Teaching Artist (sound)
3	Alcott Prep	9th	World Religions	X, X	X	
3	Barnard	3rd	Sound Installations	X, X	X	X
3	Hamilton	K	Sound in Motion	X		X
3	Hamilton	3rd	Sounds of Weather	X	X	X
3	Inter-American	K	Plants and Insects	X, X	X	X
2	Alcott Prep	11th, 12th	Music and Culture	X		X
2	Alcott Prep	9th	Sound and Conflict	X	X	
2	Barnard	3rd	Cultural Influences	X, X	X	X
2	Hamilton	2nd, 3rd	Audio Amazon	X		X
2	Hamilton	1st	Material Sound	X	X	
2	Inter-American	K	Composition	X, X	X	X

Table 4

Sound Design Project Teacher and Teaching Artist Planning Forms by Project Year, School, Grade Level, and Collaborative Team

SDP Year	School Name	Grade Level	Sound Design Project Name	Classroom Teacher	Teaching Artist (music)	Teaching Artist (sound)
3	Alcott Prep	9th	World Religions	X, X	X	
2	*Alcott Prep	11th, 12th	Music and Culture	X		X
1	*Alcott Prep	HS	Sound and Social Conflict	X	X	
1	*Alcott Prep	HS	Sound: Math and Fine Arts	X		X
3	Barnard Elem.	3rd	Sound Installations	X, X	X	X
2	Barnard Elem.	3rd	Cultural Influences	X, X	X	X
1	Barnard Elem.	3rd	Indigenous Art and Culture	X, X	X	X
3	Hamilton Elem.	K	Sound in Motion	X		X
3	Hamilton Elem.	3rd	Sounds of Weather	X	X	X
2	Hamilton Elem.	2nd, 3rd	Audio Amazon	X		X
2	Hamilton Elem.	1st	Material Sound	X	X	
1	Hamilton Elem.	1st, 2nd	Chicago Soundscapes	X, X	X	X
3	Inter-American	K	Plants and Insects	X, X	X	X

2	Inter-American	K	Composition	X, X	X	X
1	Inter-American	K	Class Themes and Sound Variations	X, X	X	X

*Alcott teachers worked with one sound artist and one music artist in year 1. In the second year, these teachers worked with different artists. Of these two artists, both worked in sound, but the one who worked with the Social Conflict unit was also a classically trained artist.

Research Question #1: In what ways are teachers impacted by the arts integrated project taught by a collaborative team of a music teaching artist, a sound teaching artist, and a classroom teacher?

Generally, the teacher/artist teams met 2-3 times throughout the first year for planning. At one school, the classroom teachers met with each other on a weekly basis. However, the teacher/artist team communication occurred more regularly by e-mail rather than at actual meetings at the school during an agreed upon time. During the 2nd year of the program, teacher/artist teams met, on average, three times throughout the year, with more consistent communication made through e-mail correspondence. Similarly, the teacher/artist teams more regularly communicated via e-mail with brief informal meetings before and/or after their scheduled classes throughout the year.

Survey data from year 2 showed that each teacher and teaching artist attended between 3 – 16 professional development sessions during that two-year period of time that they were working in SDP. Regarding the twelve professional development sessions provided by CAPE during the entire three-year period of SDP, teachers and teaching artists reported that the majority of those sessions provided them the opportunity to plan their arts integration project with their teaching team. In addition to the initial sessions in the first year of SDP that were dedicated to learning about sound and how to integrate sound/music into their projects, the teachers and teaching artists believed that providing them with opportunities to plan together and share their work with each other was the most useful time spent at the professional development workshops and was of great benefit to them.

Two of CAPE's goals are to build teacher and teaching artist capacity and to contribute to the knowledge in the field. Both these goals require teachers and teaching artists to have training in inquiry and documentation, two areas that were supported through CAPE's focused

professional development. CAPE's collaborative research agenda that partners them with external researchers, often university based, provide the last key component of CAPE's research methodology, enabling the organization to achieve their goals. This research methodology strongly contributed to the impact of SDP on teachers. SDP has given classroom teachers and teaching artists the opportunity to experience how the arts and non-arts disciplines can be and are interconnected. Through the program, teachers became more aware of how sound and sound experiences can be a learning tool for students in their own classrooms, a main focus and topic of CAPE's year 1 professional development design that introduced sound arts and sound integration to teachers. Table 5 provides a summary of the three main areas of impact that SDP had on teachers, as reported by the teachers and teaching artists themselves. These data were collected from online digital portfolios, PD surveys, planning forms, year 2 survey/reflection questions, and year 3 interviews.

Table 5

Summary of Impact of Sound Design Project on Teachers

Teacher Impact Theme
1. Knowing and Learning the Implications of Arts Integration as a Learning Tool for Student Learning
2. Understanding and Appreciation of Sound and Music Integration
3. Collaborating, Sharing, and Listening as a Result of Professional Development Workshops

Theme 1, Knowing and Learning the Implications of Integration as a Learning Tool for Student Learning. Teachers indicated that they have learned to more fully understand how to integrate sound and music (and other disciplines) into their classrooms/curriculum; i.e., how to connect academic content to arts content. Several of them mentioned that they began to think about "sound" differently and that this unique perspective on sound and integration has helped

them to understand how sound can be used as a learning tool or strategy for student learning in their classrooms. Teachers began to see the implications for integrating the arts (more specifically sound and music) into their curriculum and to notice the positive impact this integration had on student learning. While working in SDP, teachers felt that they learned how to release some control and power by allowing the students or teaching artist to lead student learning and the creative process. As a result, some teachers incorporated new methods of teaching within their own classrooms during the school day by allowing for greater freedom and flexibility as well as by providing students the opportunity to demonstrate their learning creatively. Several teachers and teaching artists described their most vivid experiences as follows:

- *It really proved to me that music can be a powerful tool to motivate kids to learn.*
- *Both experiences have offered me great opportunity to integrate the arts into academic units (both years)….Working with the artist provided me with a great resource to brainstorm activities and ways to simplify the concepts without losing rigor and content.*
- *I realized through this project that it [is] so important to look at different ways of teaching and to bring different mediums into your classroom, because it can be extremely enriching for the students.*
- *I am convinced that using sound as part of a teaching curriculum adds an element of curiosity and focus for the students by giving them a broader perspective on the content area….The use of sound helped the students stay engaged and focused on the task, making it much easier for me to teach the curriculum.*
- *Through this sound and music experimentation I realized, especially this year, that sometimes you have to let go of the plan and let the kids take you along their own exploring, experimenting, and discovering path….It has made me realize the big importance in creating more opportunities in my classroom for my students to do the experimenting and discovering in their learning.*
- *Before the Sound Design Project, I had always used my classical music training to teach music. My students would start by studying theory and music standards before ever trying to compose on their own. The study and practice was about the rules of music, not personal choices or preferences. This project has shown me a new approach, one that I found to be much more successful, particularly with younger students…. I used to think that you had to know all of the rules before you could break them or make your own. After see[ing] the success of working "backwards," I now believe students should explore their musical intuitions before and while they learn traditional theory and fundamentals.*

Teaching integration through the collaborative process of a teaching team provided much useful insight to the teaching artists as well as the classroom teachers. Through the teacher/artist partnership, teachers have learned first-hand the value of using arts integration as a tool for student learning, and they saw evidence to support the notion that arts integration provides more successful learning gains for their students. Teachers have experienced the three-step process necessary for change to occur in their teaching praxis: change in classroom practices, change in learning outcomes of students, and change in teacher attitudes and beliefs (Guskey, 2002). They have learned about music/sound integration and how to use it, they have implemented it in their SDP unit, and they have seen the results of using it in their teaching. When teachers see improvement in the learning outcomes of students as a result of implementing a particular teaching approach, their attitudes and beliefs are more likely to change and they are more likely to continue to use that approach.

Theme 2, Understanding and Appreciation of Sound and Music Integration. Through their involvement in SDP, teachers seemed to have deepened their appreciation and knowledge of sound and music. They have experimented with and learned more about sound and music, just as their students did, by engaging in hands-on activities that were intentionally scheduled during CAPE professional development sessions. These activities helped teachers think beyond traditional classroom teaching methods and gave them opportunities to experience, as learners, how the arts and non-arts disciplines can be and are interconnected. The following are a sample of comments from teachers and teaching artists regarding their reactions to these experiences:

- *I also felt that the whole project inspired me to continue to be as creative as possible. Sometimes with all the policy that goes into curriculum we forget how creative we can be with our students….I'd love to continue adding this to different areas of the curriculum.*
- *Working with CAPE over these last 3 years has made me realize that not every unit I teach needs to be taught in a traditional way.*
- *Every class unit that I taught helped me not only to reinforce some of my own methods and ideas relating to the art of teaching, but also fostered new ideas through my interactions with the students and teachers in the Hamilton classroom.*

- *I initially could not see beyond typical projects such as protest songs but helping students tap into nontraditional and very creative options such as soundscapes and use of found sounds has been really amazing.*
- *I have always believed that sound art and/or music was listening to all types of music and playing instruments. I enjoyed very much doing both on a personal level as well as exposing my students to it. This program and the collaboration with the music artist has deepened my appreciation for sound and music.*
- *Since working in the sound project and collaborating with the artists, I have had the opportunity to appreciate music a lot more.*
- *This idea [the integration of arts education as integral to the enhancement of learning other subjects] was new to me and has had a positive impact on my teaching in a fundamental way. I have a much broader appreciation and perspective on the fundamental importance of music and art as a multidisciplinary tool. Arts integration has provided me with a much richer understanding of the importance of art and music in the lives of students.*
- *[T]hrough the hands-on process—the material is easier to comprehend/wrap your head around.*

In order for teachers to want to change their way of teaching or to use a new teaching methodology, they must see the value of the new approach and believe it to be worthwhile. Through SDP and CAPE's professional development, teachers were introduced to arts integration, they learned how to use it, they actually used it in their teaching, and they saw the results of using it; this sequence enabled them to grasp how it works and understanding its impact. In the second year of SDP, teachers began to feel that they more deeply understood and appreciated the interdisciplinary connections between music/sound and other subject areas—this change in teacher attitudes and beliefs represents the critical last step in Guskey's (2002) three-step process for ensuring that teachers will continue to use their new and expanded knowledge about teaching and learning in future curricula.

Theme 3, Collaborating, Sharing, and Listening as a Result of Professional Development Workshops. Teachers were provided with opportunities to share, reflect on, and listen to each other's projects during CAPE professional development workshops throughout the three years of SDP. Because teachers had time to collaborate and communicate with other teachers and teaching artists across schools and SDP units where they saw and heard about different models

and examples of interdisciplinary curricula, teachers gained not only new ideas for curricular connections but ideas for teaching music in non-traditional ways. Teachers learned to collaborate—to share, discuss, brainstorm, reflect, and document—with their teams and across schools. During CAPE professional development sessions and in the teacher/artist team planning sessions, teachers learned to develop and identify big ideas and inquiry questions for student learning and for the goals of the individual projects. In addition, teachers learned to develop their own reflection/inquiry questions intended to help them think more critically about their teaching, curriculum development, integrating academic topics with sound/music, and student learning. Most of the data that supported this result came from the surveys completed by teachers and teaching artists after each CAPE professional development workshop. Their feedback included the following comments:

- *I have learned much from the CAPE sound project PDs and just as much through interacting with other teachers that have been part of the project.*
- *It has given me more opportunities to approach teaching music in a different manner. I have gained more ideas, working with my partners, and seeing how the students respond. Working in a group, we have to find a common denominator, as far as what to teach and how to teach it.*
- *I realized through this project that it [is] so important to look at different ways of teaching and to bring different mediums into your classroom because it can be extremely enriching for the students.*
- *…I have become more aware of integrating across multiple subjects and arts when designing lesson and unit plans.*
- *Understanding how to listen to others in order to collaborate; managing limitations/expectations [is what I learned.]*
- *This project allowed me to experiment with inquiry in the classroom.*

CAPE's goal of building teacher and teaching artist capacity is most evident in the data that support this impact theme: Collaborating, sharing, and listening as a result of professional development workshops. The professional development provided by CAPE is a critical component in enabling teachers and teaching artists to learn how to work collaboratively in order to plan and develop arts integration projects and to implement them with their students. CAPE's regular and on-going professional development provided teachers and teaching artists with

opportunities for collaborative discussion, learning, reflection, sharing, and listening. The combination of these elements make up a necessary component of teacher professional development (Darling-Hammond & McLaughlin, 1995). High quality, sustainable professional development is key for supporting teachers in their future arts integration curricular planning. For this reason, the following section on SDP Professional Development has been included in this report.

SDP Professional Development

CAPE's professional development strategy for the Sound Design Project was specifically targeted and purposefully planned prior to the implementation of the project's first year. During the preliminary planning meetings, a framework for the SDP professional development workshops was created between CAPE staff and sound artist Lou Mallozzi, Within each of the three years of the project, four professional development workshops brought together teachers and teaching artists across all participating schools, as well as CAPE staff, guests, and the researcher on this evaluation.

For the first year of SDP, the intent of the professional development workshops was to provide an understanding for experimental sound art – to ground the project in an experimental design to learning about sound arts in order to assist teachers and teaching artists in developing an interdisciplinary curriculum involving academic, sound, and music disciplines. Planning forms (see Appendix A) were used as an initial tool for prodding teachers and teaching artists to think more deeply and critically about their own personal areas of interests and inquiry. The process of helping teacher/artist teams plan their interdisciplinary curriculum began by focusing on the people rather than the disciplines themselves, thus supporting the notion that "integration has to do, not primarily with subject matter, but with people and their lives" (Mursell, 1956, as cited in Barrett, 2008). The interception of the areas of interests between the teacher/artist teams would help them develop a common topic, theme, or big idea that would later be transformed into a preliminary design for their interdisciplinary curriculum.

One particular teacher wrote about the contribution a CAPE teaching artist made to their teacher/teaching artist team:

> "As a special education teacher, I was happy to work with an artist who was patient and forgiving of my students' deficits. [The teaching artist] was really a pro,

coming into the classroom and handling the students' diverse needs. The students were quite curious about her and all she has done around the world. This is the great thing about CAPE. Their artists have experienced things, whether that be in Chicago, across the country or around the world. To me, it made the work THAT much better."

In this first year that involved hands-on activities and approaches, teachers and teaching artists learned, like students would later do, about structural and aural elements of acoustics/sound through the development of spatial maps, graphic notation, and musical scores. The first year of the professional development workshops also provided teachers and teaching artists with a foundation as well as some tools for helping design their interdisciplinary curriculum.

During the second year of the SPD, the professional development workshops focused on academic learning – how to integrate academic content with sound and music content areas. Investigations were conducted by teachers and teaching artists about the associative, semiotic, and materialistic quality of sound. These professional development workshops were intended to help teachers and teaching artists understand how to develop an interdisciplinary curriculum that would meld an exploratory approach to music making with academic content, while helping to build strong authentic connections among the disciplines.

In the third and final year of SDP, the professional development workshops focused on documentation and exhibition. Although teacher/artist teams have been documenting and reflecting on their practice and program during the first two years of SDP (see Appendix B, Sample CAPE Online Digital Portfolios), more explicit attempts were made in these professional development workshops to help them explore different ways of sharing their work, by using their documentation and building on their reflective practice, in a public exhibition. Table 6 and Table 7 summarize responses given by teachers and teaching artists after the first two professional

Table 6

Summary of Teacher and Teaching Artist Survey Responses After First SDP Professional Development Workshop in Year 3 PD

What will you take away?	Best Features of the PD?	Suggestions for improvement?
New ideas about recording techniques, which projects to do with students	Creating our masterpiece, Learning the science behind hearing +sound learning about recording/mixing	
I will take a better understanding of the way sound is recorded and recorded sound is heard. I also now have a couple of ideas about how to mix-up our SD classes this year using more recorded performances by students.	The experiment using us, and the examples of how these techniques have been used in sound installations.	An outline of the info or some kind of intro about the very heavy tech talk shared in the first hour would have been helpful
There are endless possibilities in regards to experimentation of sound. Trying to apply some of today's PD to this year's project	Creating the sound piece as a group, then listing to it with and without proximity	
Ideas of sound projects. Recording students. I didn't think about recording readings!	Loved the presenters. Loved the installations. Thank you for giving us ideas about equipment!	Maybe listening to more installations? Being able to record on our laptops. More time collaborating with artists.
How the placement of sound/movement of sound can be created or rendered. How to play with the stereos to get desired sound effects.	The explanation of stereos & sound. The 2 input system & logistics of it all. Something new I never thought about before	I always learn many things I never even knew or thought of.
New Knowledge of sound. Leads of ways to create/implement a sound installation in building	Playback activities	More team time
Ideas utilizing sound spatialization using sound proximity in my sound project	Clearness of the presentation- Quality of the content	
Ideas for creating audio/performed recordings	Group recording with "things"	

development workshops in year 3 of SDP. The themes during these workshops included discussion about possible locations and events around the public exhibit, transforming the project into an installation, translating sound works into a gallery exhibition, using a combination of

documentation - sound and artifacts - in the exhibit, using multiple sound sources and multi-channel sound playback, and how to present the exhibit at each school considering individual schools' resources, environment, and context (see Appendix D, SDP Year 3 Exhibition Worksheet).

Table 7

Summary of Teacher and Teaching Artist Survey Responses After Second SDP Professional Development Workshop in Year 3 PD

What will you take away?	Best Feature of the PD?	Suggestions for improvement?
Beginning with the end in mind! Thought about the end exhibit - installation & how to work towards that	New ideas (Lou's from power poing & the exhibits)	None. Thanks
A plan for our final exhibit	The location and "convergence".	None.
New ideas pertaining to exhibiting my CAPE project	The wine. Also - Learning a lot during the discussion pertaining to Convergence	
How will our sound installation look? Ideas for presentation	Seeing the exhibit	
New ideas to close the third year with more complex forum of projects. Looking forward to a culminating exhibition.	Excellent, complex presentation with Lou Mallozzi. The group was smaller, and I enjoyed the more intimate discussions from projects of different schools. Beautiful exhibit rich with possibilities for new projects. (very inspiring)	
A new understanding of how the program works - speaking to different teachers & viewing artwork outcomes has given me insight into how the curriculum can be integrated into projects.	Meeting collaborators face to face. Experiencing artworks. Discussing ideas in a group.	Have teachers/ artists discuss their past projects in a more deliberate & focused way.
I feel pieces of the sound project from the previewing year are coming together looking forward beginning this year and ending with the gallery.	The time for planning. I think we came up with some great ideas during our collaboration.	

The Sound Design Project public exhibition not only provided the opportunity to share SDP work with others, but further supported and made visible CAPE's four key research methodology components of inquiry, documentation, professional development, and collaborative research. It also showed the importance CAPE places on the role of research in arts integration practice and, in this case, their explicit intent to disseminate information pertaining to SDP teaching and arts practice, the impact on student learning, and the interdisciplinary curriculum designed by teacher/artist teams. By sharing their work, CAPE has contributed something new to the field of arts education and continues to work toward school improvement and change through the arts.

This professional development plan developed for SDP met all five areas of consideration in Barrett's proposed framework for evaluating interdisciplinary professional development in the arts (2008). Not only did CAPE stay true to their organizational goals, but their research methodology components are consistent with what is characteristic of quality professional development in the arts. Teachers and teaching artists engaged in activities that helped them incorporate meaningful and authentic ways of learning in the arts and students engaged in creating, performing, and responding. Year two professional development workshops helped bring together more meaningful connections that deepened the understanding of concepts across academic, music, and sound disciplines. These practices addressed two of Barrett's (2008) five areas of consideration: Disciplinary Fit and Interdisciplinary Capacity. The SDP professional development plan emphasized Teacher Imagination, Inquiry, Critique, and Reflection, as well as Collaborative Potential which are already main pillars of CAPE's research methodology. Finally, SDP professional development took into account the Contextual Fit of the varying school environments, available resources, and community support by allowing for the flexibility for curricular planning and implementation as well as the flexibility to adapt within the constraints

and boundaries of these individual contexts. CAPE's thoughtful and systematic SDP professional development plan carefully considered teachers' and teaching artists' interests, authentic and meaningful interdisciplinary connections, approaching music instruction through experimentation and its relationship with sound arts and other disciplines, inquiry and big ideas, reflective practice and documentation, and collaborative research – a model for quality professional development in the arts.

Research Question #2: In what ways are students impacted by the arts integrated project taught by a collaborative team of a music teaching artist, a sound teaching artist, and a classroom teacher?

Prior to addressing Research Question #2 based on the data collected in this evaluation, it is important to identify the inquiry questions or big ideas in each of the Sound Design Project units. The identification of the inquiry questions for the individual projects will provide a foundation for understanding the context in which each SDP unit planned and implemented their integrated curriculum. Table 8 provides an overview of the inquiry questions for each SDP unit in Years 1, 2, and 3.

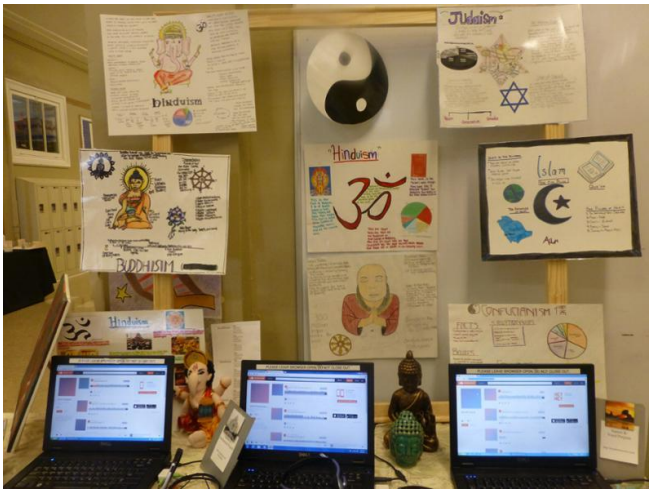
Table 8

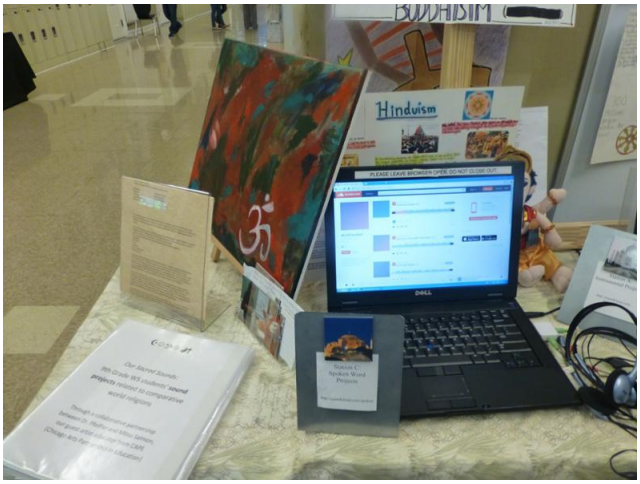
Overview of SDP Unit Inquiry Questions: Years 1, 2, and 3

SDP Year	School Name SDP Unit Name Grade Level	Inquiry Questions
3	**Alcott College Prep World Religions 9th Grade**	How can sound/ musical pieces broaden and deepen students understanding of cultural difference and beliefs?
2	**Alcott College Prep Music and Culture 11th, 12th Grades**	How does context inform the experience of an artwork—the context of where the music is heard, where it was composed, who listens to it—and how can students recognize their upbringings, lifestyles, preferences, in order to channel them creatively?
2	**Alcott College Prep 9th Grade**	How can a sound piece relate the story of a historical or modern international conflict? How can we use abstract sounds, music and original text to create a piece that extends outside of the students' personal experiences?
1	**Alcott College Prep Sound: Math and Fine Arts High School**	How do social conflicts and communication misunderstandings, small scale (gossip) and large scale (war), happen? How do they get resolved? What can protest songs accomplish?

1	**Alcott College Prep Sound and Social Conflict High School**	In what ways do mathematics and fine art intersect, and how is this relevant to the students within Chicago Public Schools?
3	**Barnard Elem Sound Installations 3rd Grade**	How does an awareness of sonic and social environments help us to adapt our own behaviors?
2	**Barnard Elem Cultural Influences 3rd Grade**	How do sounds of the environment influence culture through language and music? How can third grade students connect their communities to the history of the city and write songs that reflect their understanding of the relationship between the music of migrant cultures and what they experience in their communities?
1	**Barnard Elem Indigenous Art and Culture 3rd Grade**	Can third grade students understand their communities as tied to the history of the city and write songs that reflect their understanding of the relationship between the music of migrant cultures and what they experience in their communities?
3	**Hamilton Elem Sound in Motion Kindergarten**	What properties affect the sound of objects in motion?
3	**Hamilton Elem Sounds of Weather 3rd Grade**	How are the sounds of weather created and how can we artificially reproduce them?
2	**Hamilton Elem Audio Amazon 2nd, 3rd Grades**	How do insects use a variety of sounds to communicate within their environment? How do insects produce sounds and for what purpose?
2	**Hamilton Elem Material Sound 1st Grade**	How can we use discarded/recycled material to create a chamber music ensemble? How can we use reclaimed/recycled materials to create instruments?
1	**Hamilton Elem Chicago Soundscapes 1st, 2nd Grades**	How does a changing landscape affect the sonic environment?
3	**Inter-American Magnet Plants and Insects Kindergarten**	How can we express personal values through sound?
2	**Inter-American Magnet Composition Kindergarten**	What are the roles of people involved in creating and performing music?
1	**Inter-American Magnet Class Themes and Sound Variations Kindergarten**	How do our listening skills affect how we process sound? What varieties of listening do shared sound activities make us aware of? What varieties of sounds do shared listening activities make us aware of?

SDP more powerfully addressed students' social and emotional gains, many of which are essential skills for work and life today. These critical skills, as identified by 21st Century Skills, include Core Subjects and 21st Century Themes; Learning and Innovation Skills; Information, Media, and Technology Skills; and Life and Career Skills (Partnership for 21st Century Skills, 2010). The individual units in SDP explicitly emphasized particular 21st Century Learning Skills. These data were collected from online digital portfolios, planning forms, year 2 survey/reflection questions, and year 3 interviews. One teacher expressed the importance of students gaining these skills even over other academic learning more powerfully: "I am glad that this work supports Common Core key standards but I am even more appreciative of the increase in student engagement that comes as a result of the project. Students gain a creative outlet and way for them to 'show what they know.' They learn from us, our artist, and from each other." Table 9 provides a summary of the skills most emphasized in each of the six SDP units in year 2 and in the five SDP units in year 3.





Figures 2 and 3: Alcott's 9th grade Sound Installation at Rhetorical Throwdown, based on world religions, cultures, and historical contexts.

Table 9

Impact of SDP Years 2 and 3 on Students: Summary of Emphasized 21st Century Learning Skills

School / Grade Level	**Core Subjects Learning** (English/reading/language arts, world languages, arts, mathematics, science, geography, history, government/civics)	**Innovation and Critical Thinking Skills** (Creativity and Innovation, Critical Thinking and Problem Solving, Communication and Collaboration)	**Media and Technology Skills** (Information Literacy, Media Literacy, ICT [Information, Communications and Technology] Literacy)	**Life and Career Skills** (Flexibility and Adaptability, Initiative and Self-Direction, Social and Cross-Cultural Skills, Productivity and Accountability, Leadership and Responsibility)
		Year 3		
Alcott Prep 9th Grade	World Religions/History/Cultures	**X**	**X**	**X**
	Reading			
Barnard Elem 3rd Grade	World languages			**X**
	English/reading/ language arts			
Hamilton Elem 3rd Grade	Science	**X**		
Hamilton Elem Kindergarten	Science	**X**		
	Physics			
Inter-American Kindergarten	Science	**X**		
		Year 2		
Alcott Prep 11th, 12th Grades	Government/ Civics			**X**
Alcott Prep 9th Grade	English/ Reading/ Writing		**X**	
	History			
Barnard Elem 3rd Grade	History	**X**		
	World Languages			
Hamilton Elem 2nd, 3rd Grades	Science	**X**		
Hamilton Elem 1st Grade	Science	**X**		
Inter-American Kindergarten	Language Arts	**X**		
	Science			

Innovation and Critical Thinking Skills are at the forefront of most of the units in SDP. Although all the units addressed at least one other 21st Century Learning Skill, each had a main focus in one particular area. Four of the five units in year 3 and four of the six units in year 2 most strongly addressed the Innovation and Critical Thinking Skills which include creativity, problem solving, communication, and collaboration. Only one unit, Alcott's 9th grade world religion unit, seemed to provide learning opportunities spread evenly across the three skill sets.

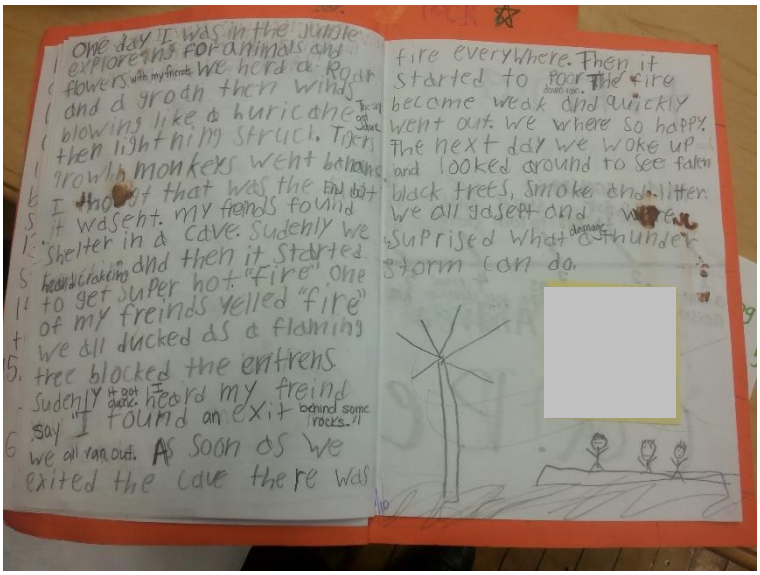


Figure 4. A Hamilton student writes a weather story based on specific weather events that were studied in class.

Figure 5. Third graders from Hamilton SDP present their project on weather systems and the recreation of sounds associated with them.

Teachers and teaching artists reported that their observations of the students support the data that SDP explicitly addressed 21st Century Learning Skills. In particular, they mentioned skills related to Innovation and Critical Thinking most often. What teachers and teaching artists said about the impact of SDP on students is shown in Table 10, data collected from online digital portfolios, planning forms, year 2 survey/reflection questions, year 3 surveys, and year 3 interviews.

Table 10

Teachers' and Teaching Artists' Comments on the Impact of SDP on Students in Regard to 21st Century Learning Skills

Core Subjects Learning (English/reading/language arts, world languages, arts, mathematics, science, geography, history, government/civics)
• *Students were using their writing to recreate stories pertaining to specific weather events as had been studied in class lessons.*
• *During this unit, through research, readings, and discussions students learned about various aspects of weather, including the differentiation of weather and climate, types of clouds, the relationship between temperature and humidity levels, as well as various weather events (hail blizzards, thunderstorms/lightning, wildfires, and wind/sandstorms).*
• *They not only learned about the subject matter, but also had to employ it and demonstrate that they really understood.*
• *Students learned through sound why certain objects sound the way they do when bounced rolled, scraped onto wood and various other surfaces. They also learned what factors impact the variety of sounds made. The materials made-up of the objects, and the material make-up of the surface that the object was impacting.*
• *The students were able to identify various properties of sound as well as how it applies to various types of balls.*
• *I think it was a very positive experience for the students. First of all, it made them very interested to learn about the subject, because they were actually experiencing it firsthand, not just reading about it in a book or watching a video…. They were able to learn about certain aspects of music, different cultures, and the history of Chicago all at the same time.*
• *In my "Audio Amazon" project we integrated art/sound/film into a science curriculum by teaching the students about four insects living in the Amazon rainforest. The students acted out a reader's theater style play that was filmed and then screened in the Hamilton Elementary Gymnasium for three other classrooms as well as parents.*
• *We based our lesson plan on the existing academic unit and found places where music overlapped with the sound concepts. We framed the physics concepts through music.*
• *Students were able to learn the concepts that were part of the science curriculum while collaborating with a musician to create a symphony.*
• *We focused on fairy tales, oceans, plants, and insects.*
Innovation and Critical Thinking Skills (Creativity and Innovation, Critical Thinking and Problem Solving, Communication and Collaboration)
• *Experimentation was very important in trying to choose the best materials to represent specific sounds.*
• *This project not only let them dive deeper into their assigned religions, but it allowed students to explore their creative side.*
• *The [students] were able to work together while expressing their individualism and experiment with creative ideas.*
• *When applying sound to the teaching content, an added layer of depth was created, giving the classroom setting a more enjoyable and hands on experience for the students. Turning a 'lecture on sound' much more into a 'sound laboratory.'*
• *The overall learning experience was enhanced by the use of sound, helping to keep the classroom environment fresh and open to new possibilities.*
• *Students worked together and were able to solve problems together. During our first year the students seemed very interested in the instruments and playing them. They embraced the idea of illustrating what*

they heard and making the connection to what we were learning in the classroom. They were able to share ideas and take turns with instruments.

- *Students quickly learned the importance of keeping an open mind and listening to the ideas of others. Everyone was always making creative decisions and sharing with each other, and taking turns being a composer/musician/audience member.*
- *Through the opportunities this program brought, students have learned greater independence. They are encouraged to show their learning in a way of their choosing. It has allowed for greater critical thinking and reflection.*
- *This project gave them a chance to be creative, so it made them very excited to learn….When they worked in their small groups, they worked very well together, helping and supporting each other.*
- *Students are encouraged to use all their senses in their learning, bringing another layer in their learning which increases understanding. It caters to the different learning styles and encourages students to think outside of the box, leading the students to think critically about the academic subject. Students were able to express what they have learned about the different cultures in different ways.*
- *This project also was driven by the students' questions and wonders. They were able to drive the instruction by using their prior knowledge.*

Media and Technology Skills

(Information Literacy, Media Literacy, ICT [Information, Communications and Technology] Literacy)

- *[The students] had to gather information from the Internet, educational videos, and teacher-provided resources to make appropriate choices.*
- *The students listened to the interaction of their noises with the spaces while making recordings with a directional microphone and taking photos on an iPad.*
- *[The students] used a lot of technology they were not familiar with.*
- *For the "Audio Amazon," students used our class blog to identify insects from the Amazon Rainforest that produced sound….Students spent 3-4 hours on iPads over the course of 2-3 days searching for any information that would assist in the creation of our documentary…. [N]ot only did students learn about each insect in detail, they also learned a great deal about how to use Internet search engines to find the best information.*
- *It offered real computer based work (editing and file transferring) not only the type of consumer experience we often find in the classroom such as iPad apps.*
- *Not only sound and music but all of the skills involved in the project resulted in progressive learning: the seeking and recording of sounds, the manipulation of digital files from device to computer, editing and modifying the sounds into composition, the research involved in composing a text, performing a reading of the test. All of these tasks challenged students in new ways.*
- *Incorporating various forms of media, either sound or video-based, enhances the unit and assist in keeping students' attention, focus, and interest on the unit.*

Life and Career Skills

(Flexibility and Adaptability, Initiative and Self-Direction, Social and Cross-Cultural Skills, Productivity and Accountability, Leadership and Responsibility)

- *It was great to experience my students learning through experimentation, cooperation, and compromise.*
- *Whenever students are given the opportunity to explore a subject in a non-traditional way (sound-focused), it allows them to be more creative. It sparks a desire in them to find more information to move their project along.*
- *I value seeing the students gain confidence in themselves and show pride in their projects.*
- *We had a student sing publicly for the first time during this project. …since then, she has sung twice in front of the entire school!*
- *Students have now taken on some leadership with this. You will hear students reminding each other of certain behaviors. Our class was also chosen to model to the school how to walk through the halls and exit the school.*
- *Students got to experience what they were learning in a real life setting and share with family and friends from our community. It was Amazing!*

- *Students were very engaged and I observed them "playing" musician during their free choice time at the end of the school day. They were also observed creating instruments during this time as well.*
- *Once we laid the ground work, the students really took off with the project and to ownership.*
- *It was amazing to see the students really sit and listen during "listening" moments and then really take charge during the production of creative pieces….They take ownership of their learning and that is much more valuable for them.*
- *[T]he students were challenged to make creative and independent decisions. It was wonderful to see how comfortable many of the students were with those challenges, and how other students grew comfortable after feeling empowered by the ability to make their own creative choices. I noticed the students became very interested in what each other had to say and share with the class.*

The subject areas most frequently addressed in SDP were science, language arts, and history. It is not surprising that the most emphasized 21st century learning skills in SDP units was Innovation and Critical Thinking. Although several different learning skills were addressed in each SDP unit, the most emphasized in four of the six units in year 2 and four of the five units in year 3 specifically related to creativity, critical thinking/problem solving, and communication and collaboration—essential skills for working with others in small business as well as in global settings.

The strongest evidence of student musical learning was in six of the nine National Standards for Music Education (National Association for Music Education, 2014), including two of the least addressed music standards: #3 and #4 (Orman, 2002). In some way, all 11 SDP units from years 2 and 3 engaged students in activities that connected music/sound with other disciplines of study in and outside the arts, addressing standard #8 (see Table 11). In addition to understanding the relationships between music and other arts and disciplines, the connections made to history and culture were particularly emphasized in the SDP units through the study of sound arts. Overlapping with CAPE's mission, these six of nine standards for music education are embedded within the four National Core Arts Standards (NCCAS, 2014). The data for addressing the impact of SDP on students' arts learning were collected from online digital portfolios, planning forms, year 2 survey/reflection questions, year 3 survey, and year 3 interviews. See Table 11 for information on the impact of SDP on student arts learning skills.

Table 11

Impact of SDP Year 2 and Year 3 on Students: Summary of Emphasized Arts Learning Skills

National Core Arts Standards *CAPE Mission*	**Creating Performing** *Increase Students' Creativity*	**Responding** *Increase Students' Critical Thinking*	**Connecting** *Increase Arts Driven Education*
National Standard for Music Education	#3 Improvising melodies, variations, and accompaniments #4 Composing and arranging music within specified Guidelines (Creative)	#6 Listening to, analyzing, and describing music #7 Evaluating music and music performances (Evaluative)	#8 Understanding relationships between music, the other arts, and disciplines outside the arts #9 Understanding music in relation to history and culture (Integrative)
Year 3			
Alcott Prep 9th Grade	**X**	**X**	**X**
Barnard Elem 3rd Grade	**X**	**X**	
Hamilton Elem 3rd Grade	**X**		
Hamilton Elem Kindergarten	**X**	**X**	
Inter-American Kindergarten	**X**	**X**	
Year 2			
Alcott Prep 11th, 12th Grades	**X**	**X**	
Alcott Prep 9th Grade			**X**
Barnard Elem 3rd Grade		**X**	**X**
Hamilton Elem 2nd, 3rd Grades	**X**		
Hamilton Elem 1st Grade	**X**		**X**
Inter-American Kindergarten	**X**	**X**	

Similarly, teachers and teaching artists reported on their beliefs about what students learned in SDP in relation to arts learning skills. Online digital portfolios, planning forms, year 2 survey/reflection questions, year 3 survey, and year 3 interviews provided these data from teachers and teaching artists. Two units of SDP during year 3 deserve particular attention because they relate directly to the Creating and Performing National Core Arts Standard or Composing and Improvising standards for Music Education. In the first project, the students collaborated in small groups to create an original composition incorporating environmental sounds captured on audio recordings in different areas of their school. Instead of a live performance, their culminating event included an innovative way to deliver the audio compositions. One teacher described this process:

> "Cardboard boxes served as the resonator/speaker for the audio compositions created by the students. Their compositions play back from mp3 players attached to transducers which resonate the cardboard box. These boxes are also collaged dioramas created from images that the students took while they were recording. The dioramas include photographs, drawings, and translations of the lyrics of their songs into Spanish."

The main idea for this project was for students to become aware of their sonic and social environments. In this case, the students learned a new way to create compositions, use technology, and display/present their work in non-traditional ways and settings. Through song composition and sound installation, students became more aware of what kinds of behaviors are appropriate in certain types of environments in- and out- of school and learned how to adapt their behaviors accordingly.

The second SDP project deserving attention is a unit at another school where students composed and improvised pieces and created final compositions through non-traditional music instruction. The project is explained by one teaching artist:

"Students learned about scores, composing, listening, following and leading. All of these things are important to a traditional music education, but they were taught through sound experimentation. For example, one of the first scores the students made started with the creation of a sound map after we went on a sound walk around the school building. They worked to re-create the sounds they heard outside, while inventing graphic symbols to represent the sounds on the score, then they experimented with various ways to play the score. Some groups played the score without a designated leader, some had an audience member conduct a semi-improvised version of their score, and others had a conductor that was part of the group lead the performance as they had rehearsed it. As the project progressed, we decided the groups needed a specific sound plan to help them focus on the project. They did a lot of experimenting and improvising throughout the unit, but the final recordings were planned out with a timeline. The timelines made clear the event being played, what material was making the sound, and which student would make that sound."

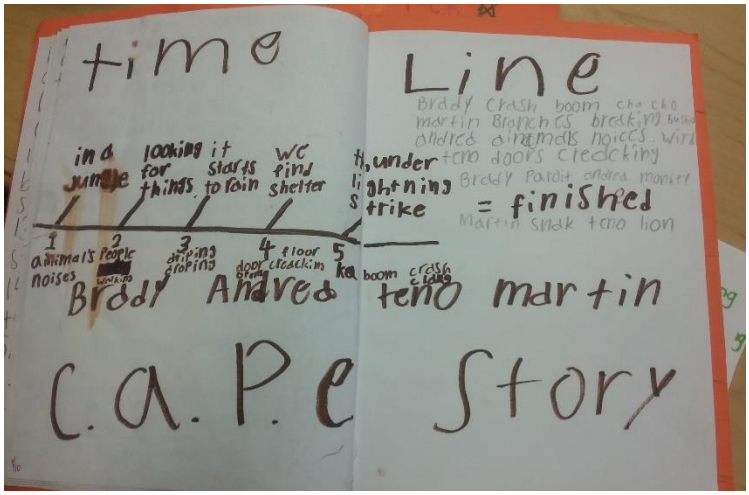


Figure 6. Example from a 3rd grade group at Hamilton Elementary of a non-traditional composition using a time line.

Since the students were able to experiment with found materials instead of using musical instruments, it "allowed the students to feel instantly capable of creating something. They were able to spend more time composing together instead of working individually on learning a traditional instrument," explained a teaching artist. Table 12 provides a summary of comments regarding the impact teachers and teaching artists observed on students' arts learning.

Table 12

Teachers' and Teaching Artists' Comments on the Impact of SDP on Students in Regard to Arts Learning Skills Related to National Core Arts Standards, CAPE Mission, and National Standards for Music Education

Creating / Performing *Increase Students' Creativity* #3 Improvising melodies, variations, and Accompaniments (Creative) #4 Composing and arranging music within specified Guidelines (Creative)
• *The students created a song and sound installation about what it should look and sound like (behavior) in certain areas of their school.* • *[The students] thought more deeply about how music is made and created, and for what purpose.* • *Students had the opportunity to imagine the sounds of insects and plants, and create them using musical instruments (small percussion) and ordinary objects (paper, straws, et).* • *We played rhythms all together with hands, feet, and percussion instruments. We introduced the idea of rhyme and words that sound similar – and began to write songs about what different areas of the school do and should sound like.* • *Part of the unit introduced musical terminology such as: tempo, dynamics, rhythm and conduction. All of these terms were integral to the performance of the recorded material. The recorded sound pieces were conducted by CAPE [teaching] artist and utilized all of the above musical elements during recording.* • *These [science] lessons were then used as a springboard to create a sound installation using the different balls and the sounds they make.* • *[S]tudents would become a conductor, composer, musician, and/or audience member. They used the academic topic and their imagination to inspire the music they were creating and performing.* • *We recorded their songs with singing and percussion instruments, and later the student s played samples of the room recordings they made to add another layer of percussion and sound effects to their songs.* • *Students had to process what was making the sound, how it made the sound, and how it could be imitated using only the human body, small percussion instruments, or classroom supplies such as paper.* • *They performed for each other and were very pleased with the outcome.*
Responding *Increase Students' Critical Thinking* #6 Listening to, analyzing, and describing music (Evaluative) #7 Evaluating music and music performances (Evaluative)
• *Developing listening skills improved students' ability to create space and silence for deliberate sound-making.* • *We thought about how sound is a vibration and moves through materials – like walls, windows, desks, and floor, and how different sized spaces have different resonances. We experimented with microphones, cup and string telephones, and hitting different sized drums.* • *Students were able to think how the sound of an insect could be represented by manipulating an object, their bodies, voices, or small percussion instruments.* • *Most exciting… was the connections some of the students made between visual symbols and sounds. More specifically, the use of an abstract symbols to represent a sound This is a concept that I did not expect so many of the kindergarten class to understand. Abstract thought, multiple ways of looking at an idea or solving a problem, thinking outside of the box. This is an idea that many of the students connected with something that I felt extremely proud to have witnessed and to have had a small part in teaching.* • *By broadening the definition of both sound and music, children were displayed freedom to explore their own experiences as listeners of objects, people, locations, recordings, themselves, etc.*

- *Many of the students struggled at the beginning to analyze different types of music, but as the semester progressed, I could see that they felt more and more comfortable analyzing.*
- *We would start each class by playing a recording and asking students to close their eyes and imagine something related to the recording and academic topic of the day.*
- *Students were exposed to recordings of a variety of sounds made by humans, plants, insects, instruments and electronics. They were asked to listen carefully and mimic the sounds they heard.*

Connecting

Increase Arts Driven Education

#8 Understanding relationships between music, the other arts, and disciplines outside the arts (Integrative)

#9 Understanding music in relation to history and Culture (Integrative)

- *Almost all of the students [did] not realize that the music they listen to today mostly originated from different cultures and time periods. If not the entire song, some of the components came from a different place or time.*
- *[I]t was clear that [the students] were making connections of their own not only about the music that they gravitate towards, but of the relevance of that music to their lives and their own – perhaps untapped – creativity. The students discovered the connection between their experienced feelings and those expressed in the music they enjoy. This understanding led them to imagining music of their own making that would reflect their inner worlds.*
- *We learned about foods, sounds, art work, music, etc….It was also great that they had that connection to their teachers and their culture. This makes it more personable.*
- *It was helpful to be able to teach a concept (such as vibration) and then immediately experiment with building instruments that created low and high pitches, and in some instances, to actually see the vibration.*
- *[The students] also thought about what music could do and how making music could affect a community.*

Because SDP units were principally integrative, all units addressed in some fashion the *Connecting* standard, which included National Music Standards #8: Understanding relationships between music, the other arts, and disciplines outside the arts; and #9: Understanding music in relation to history and culture. Additionally, four of the six SDP units in year 2 and all five of the SDP units in year 3 more strongly emphasized *Creating/Performing* by having students compose, improvise, and perform music as the main focus of the unit. This is not surprising since CAPE's teaching artists in this evaluation seem to have a genuine interest in developing students' compositional and creative skills that enable them to develop those particular musical abilities at a more rapid pace than had they been taught through traditional music instruction. The experiences gained through SDP also seem to help students connect what they learned with the teaching artist in regard to sound composition, creativity, and improvisation with experiences

outside of school. Giving young people opportunities to better understand and interact with the ideas of composition and improvisation is what one teaching artist would like to further explore. For CAPE, this is significant because the National Standards for Music Education #3 and #4 are considered the two least addressed standards in general elementary music classrooms (Orman, 2002). Educators who believe that a high level of musical skill are required in order teach and learn composition, arranging, and improvisation, may feel that these standards are also the most difficult to address. The creative standards are certainly least likely to be addressed with musical performance groups since the main focus of their time is spent on performance preparation.

An example of a unit where students were exposed to musical composition through sound exploration at a young age is the year 3 SPD unit with kindergarteners at Inter-American Elementary. In this unit, the students used their senses to explore and observe materials and form their own investigations about the life cycles of plants and insects. They used musical instruments and ordinary objects to create their musical compositions that would simulate the sounds of insects. A teaching artist reflects on the students' art pieces:

> "The recording is a superimposition of the audio content from the four speakers of the Kindergarten Sound Garden. It comprises sounds chosen and generated by Kindergarten students using musical instruments, objects, voice, and their bodies. Each of the two classrooms were represented by a pair of speakers, evoking the imagination and memory of each of the student's impressions of insects and plants through sounds. The audio (5 minutes long) looped endlessly in the installation, creating effects of specialization and temporal intervals."

In year 3 of SDP, classroom teachers and teaching artist were asked to complete a musical learning /arts integration survey reflecting how important certain indicators were for them to teach. The survey data were collected from four classroom teachers, two music teaching

artists, and one sound teaching artist. These data further help support the findings reported earlier regarding students' socio-emotional learnings as well as students' musical learning in relation to innovation and critical thinking skills as well connecting and creating/performing.

Teachers and CAPE teaching artists reported similarly to each other on specific items from the Musical Learning Survey (see Appendix C for a summary of the reported data). Of particular interest are the highest scoring items on the survey as well as the lowest scoring items. Two of the items receiving unanimous scores by all the teachers and teaching artists, scoring the highest with a strongly agree, were 7) Develop and encourage creativity and 8) Encourage self-expression. The second highest scoring items receiving the same score of 5 responses of strongly agree and 2 responses of agree were 13) Reinforce learning in other subject areas and 14) Make connections with academic subjects. These items, which are part of the 18 items taken from Abril and Gault's Elementary Music Goals Survey (2005), represent the area of expressive/creative and interdisciplinary in the music curricula, respectively. Also receiving a unanimous score of strongly agree was item 16) Make it fun, which is an entertainment/diversion goal. Scoring highest under musical goals were 4) Improve musical listening skills and 1) Teach the musical elements (rhythm, melody, etc).

Scoring most evenly between strongly agree and neither agree nor disagree were the three items pertaining to the sociocultural goals, items 10, 11, and 12. It may be that these items are viewed more of a general expectation and likely outcome of an arts interdisciplinary curriculum and less as a targeted and explicit goal of SDP, thereby, scoring neither agree nor disagree more heavily than any other item on the survey.

Other items that were given a score of agree and strongly agree on the survey by the majority of the survey participants were those items related to student's personal musical experiences and learning through the process of music making, the identification of inquiry

questions as well as arts and academic content through a shared concept or big idea, using hands-on approaches and reflection for learning, and building social-emotional skills and creative expression (items 24, 27, 29, 30, 31, 33, 34, 45, and 48). Only three items on the survey received at least one strongly disagree from the survey participants, one of the items (22) was scored by the majority of the respondents as strongly disagree and disagree:

> 21) Students need basic musical skills (i.e.: technical, theory) in order to understand how music connects to the other arts and content areas.
>
> 22) Experiencing music as a product (performance, culminating event (is most beneficial for students, rather than experiencing it as a process.
>
> 49) I plan and implement integrated arts curriculum with an in-school arts specialists.

Interestingly, it was the teaching artists, both music and sound artists, who reported the lowest scores on these three items. These data infer that teaching artists and teachers bring with them particular perspectives and predispositions about the value of music in education. In this evaluation, the teaching artists were more likely to believe that students benefit most by learning and experiencing music as a process, rather than experiencing music as a final product. They see the practice and process of music making more valuable than experiencing music when activities and lessons are centered on performance preparation and presenting a culminating event. Likewise, teaching artists believed more strongly than teachers that students can understand connections between music and other arts and non-arts disciplines without the need to acquire basic musical skills. It may be that teachers, still new to arts integration, do not feel comfortable or confident with nor fully understand how musical concepts and concepts from other disciplines are interrelated, and therefore, maintain the belief that students would not understand these connections either unless they have a certain level of basic musical skills. Lastly, it is evident

from the results of this survey that in-school arts specialists are least likely than classroom teachers to plan and implement an integrated arts curriculum with an external arts provider. Although some arts integration studies involve classroom teachers together with their school's arts specialists, interdisciplinary curricula continue to be more prevalent between teaching artists and general classroom teachers, than with teaching artists and arts specialists.

Students involved in CAPE's SDP gained pertinent and valuable skills, necessary for the future and in the 21st century global economy in which we live. Through SDP, innovation and critical thinking skills were more powerfully addressed. These skills include creativity, problem solving, communication, and collaboration. The strongest evidence of musical learning skills were creating/performing and responding, those that also encourage students' creativity and critical thinking skills. Therefore, it is not surprising to find that the data collected from the Musical Learning Survey showed that teachers and teaching artists considered these very same social, emotion, and musical learning skills to be of the highest priority to them in SDP.

Research Question #3: How does the combined teaching of sound and music in an arts integrated project impact the classroom environment?

The skills learned by the students in SDP crossed over into other areas of their schools, outside of the SDP environment. In year 3 of SDP, one unit intentionally linked their project with a school-wide effort to promote Positive Behavioral Interventions and Supports (PBIS), a Chicago Public School initiative. By doing so, "it allowed students to recognize how sounds can help or distract them at school…. Not only were the students developing a practice of stillness, and listening, but they were becoming aware of how sounds create an environment for concentration or distraction" said one teacher. A teaching artist continued:

> "By the time we took our field trip on the final day of activities the evidence of improved listening was really apparent. The whole group sat on the meditation cushions silently for a one minute meditation. Afterwards, one student raised his hand to comment 'That is the quietest we have been, EVER.' When the meditation teacher asked the students, 'What did you hear?' one student's response was 'the air-conditioner ventilation.' I knew she was listening deeply!"

The classroom environment developed within SDP extended into other classrooms and areas of the schools, not only as a result of SDP's impact on the students, but also as a result of the program's impact on the teachers involved in the project. The teacher/artist partnership required a set of skills that also had a positive impact on the school environment. The data collected in this study to address RQ#3 included the impact of the project that was carried over into the

Figure 7. Barnard students on a field trip to the Shamabala Center

school environment by both teachers and students. Table 13 provides a summary of these shared skills that impacted the school environment. These data were gathered from year 2 survey/reflection questions, year 3 online digital portfolios, and year 3 surveys.

Table 13

Summary of Shared Skills That Have Impacted the School Environment

Central Theme	Extended Skill Areas
Listening and Hearing	Listening / Focused Hearing
Collaborating and Sharing	Teamwork / Working Together, Community Building, Collaborating, Sharing / Reflecting
Connecting and Creating	Connecting, Creative Thinking, Choice / Freedom
Leading and Facilitating	Facilitating / Guiding, Leading / Teaching

As part of this evaluation, teachers and teaching artists provided their thoughts and observations on how SDP impacted the school environment; Table 14 shows some of their comments.

Table 14

Reflections by Teachers and Teaching Artists on the Impact of SDP on the School Environment

Listening and Hearing (Focused Hearing, Listening)
• *As we walk through the halls of the school, sit in the classroom, attend our Specials classes, students are clearly aware of the sounds around them. They are able to recognize what it should look and sound like in certain environments and adjust their behavior accordingly.*
• *In contrast to their high energy in the classroom, [the students] interacted with their memories of classrooms activities in acts of quiet contemplation [as the listened to their Sound Garden installation.]*
• *I found a strong response to the class materials by witnessing the kids become more 'loose' and involved with each other in group activities, closely paying attention to each other and listening. Their discovered sense of listening – of focus of attention – impacted them throughout their classes, as I have heard from their teachers after the class ended, how role playing "Conductor" and "Performer" exemplified model behavior of attentiveness and respect in "Teacher" and "Student" situations, as well as interacting with other kids.*
• *[T]he teachers have told me they've noticed a positive difference in the way the students listen to things around them, including the teacher and other students.*
• *I think as a whole the classroom environment became a bit more focused when I brought in sound making devices or when I introduced the students to making sounds using classroom materials. In addition, I feel that presenting the "sound walk" for the students, having them sit quietly in various*

locations outside the school and write down sounds they heard, has had an important impact on the classroom as a whole. Giving the class a new way of focusing their hearing.

- *[T]he children learned appreciation for silence and sound-making alike. Consequently, they have developed vital listening skills beyond artistic forms. Their listening of instructions and spoken class content was sharpened with each session, as they expected to use their ears through their newly discovered self and group awareness through sound.*

Collaboration and Sharing
(Collaborating, Teamwork, Working Together, Community Building, Sharing, Reflecting)

- *The performance really taught the students how to collaborate better as a group. In the beginning of the year my students didn't work so well in groups, fighting over roles or arguing/disagreeing. I really feel that having to work together to create their musical pieces my students learned how to collaborate as a group better. They realized that each of their parts in the piece was important and worked together to create their pieces.*
- *Teamwork is essential in our classroom. This project further encouraged and promoted that. Because of students' excitement to have music incorporated into our curriculum, collaborating became easier.*
- *Students learned to work well in groups throughout and after [the CAPE project].*
- *Not only did students learn about sound and music but they also put into place what working together is all about.*

Connecting and Creating
(Connecting, Creative Thinking, Choice, Freedom)

- *I can honestly say that CAPE has taught all of us to think a bit more creatively about sound and its constant existence in our environment.*
- *Overall, the classroom environment has begun to change. With choice being given, allowing students to express themselves through music and sound, there's a sense of freedom. Students went from showing hesitation to the writing of the music, to asking if they can work with others to come up with their original pieces even after the project was done.*
- *They learned to make those meaningful "connections".*
- *Having music and the arts incorporated in the classroom changes the learning environment for the better….It has enhanced our learning experience by allowing the students to communicate their readings, understandings, explorations in a creative way.*

Leading Facilitating
(Leading, Teaching, Facilitating, Guiding)

- *Students were given new perspective on one another by being allowed to lead and teach each other in a creative rather than strictly academic context. Students who may have seemed distracted and disruptive at first meeting were able to focus and engage in creative exercises more so than in the context of our lectures.*
- *I believe arts integration is a vitally effective tool for differentiation. I have seen students that seemed disengaged and unmotivated totally transformed by the sound projects.*

CAPE's SDP seemed to have a lasting impact on students that extended beyond their classrooms. Students and teachers in SDP had new experiences and opportunities to sharpen particular skills that resulted in identified changes within the school environment. The data provides evidence to suggest that students more consistently engaged in focused hearing and listening as well as teamwork and collaboration, creative thinking and connecting, and leading and guiding.

Model SDP Interdisciplinary Curriculum

In this section, a sample SDP unit will be explained in greater detail. The unit, titled *Sound in Motion*, was an audio and visual experiment and exhibit developed by a sound teaching artist in collaboration with a classroom teacher at Hamilton Elementary. The arts integration unit was implemented in the third year of SDP with kindergarten students. The final project of this semester long unit was an installation that explored "how various physical properties impact the dynamics of sound in interesting ways." For the exhibit, the unit was described by the CAPE teaching artist and classroom teacher. Imagine attending the exhibit and reading about the unit:

> *The unit was divided into three parts: part one explored the definition of sound, what it's made of and why it exists, as well as why it travels at different speeds through different mediums. Part two focused on assigning visual symbols for various sounds that were heard, and writing these symbols on a 'graphic score' that would make up the visual element of exhibit. Part three focused on physical objects, and why certain objects sound the way they do when put through certain tests including: bouncing, knocking, scraping, and rolling on wood, paper, and aluminum. For our project, we used various types of balls to create our sounds including: tennis, golf, racquet, wiffle, and baseballs.*
> *This exhibit, called Sound in Motion, invites you to listen to sounds that were made by Hamilton students using various round objects. CAPE teaching artist conducted 5 tables of students (2-5 students per table) to help create these interesting 'sound collages' for your enjoyment. Put on the headphones, push play, listen to the sounds, and also explore the visuals on the 'graphic score.'*
>
> *What are some of the connections you could make between the visual symbols and the sounds heard on the recording?*

Figure 8. Sample sound collage table at the Sound in Motion exhibit in the Hamilton Elementary gymnasium.

Part I. What is sound?

Sound is a type of energy that's made by vibrations. When any object vibrates, it causes the movements of air particles, and when these particles bump into particles close to them, they too begin to vibrate. This movement is called sound waves and these waves keep moving along until they run out of energy. If your ear is within range of these waves, you hear the sound.

Picture a stone thrown into a still body of water. The rings or waves expand indefinitely, the same is true with sound. Irregular repeating sound waves create noise, while regular repeating waves produce musical notes.

"Look at various symbols that Hamilton Students created to see if any of them might represent a sound wave. Look for small 'W,' 'E,' and 'V' letters drawn in the white areas of the poster, these represent Waves, Energy, and Vibration of molecules."

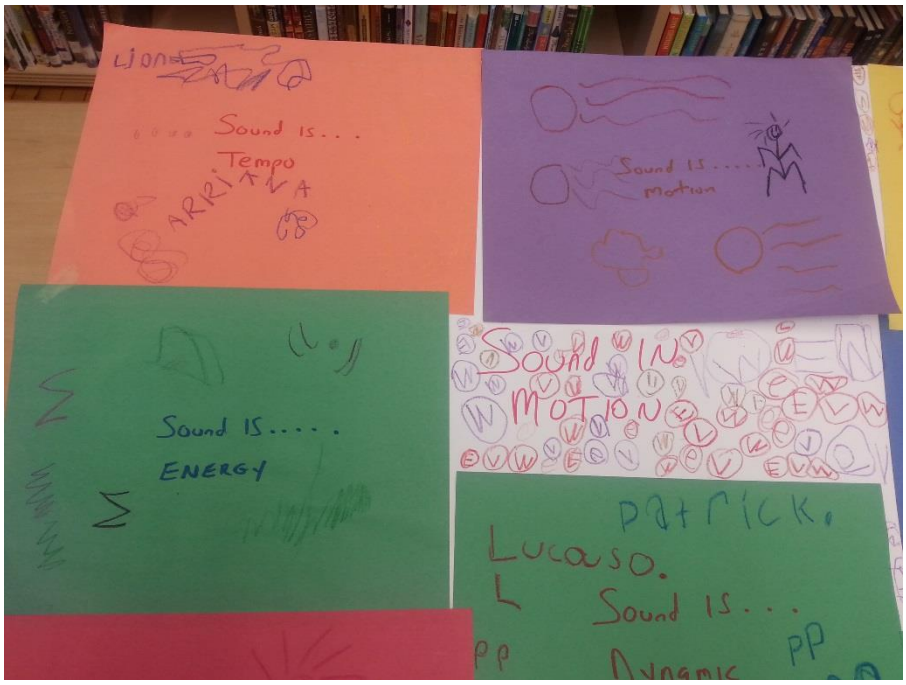


Figure 9. Graphic scores or representations by Hamilton kindergarten students of their sound discoveries using various balls.

Curious Questions:

1. *Can sound travel through water? Yes, sound moves four times faster through water than through the air. In water, the particles are much closer together, and they can quickly transmit vibration energy from one particle to the next. This means that the sound wave travels over four times faster than it would in air.*
2. *Is there sound on the moon? No, there is no sound on the moon or in space because it is a vacuum. Sound needs something to travel through like air or water.*
3. *What's the speed of sound? In dry air, sound travels at 343 meters per second (768 mph).*

Part 2. What are Symbols?

A symbol is an object that represents, stands for, or suggests an idea. In the Hamilton classroom, we explored different areas of sound. Quite sounds, loud sounds, long sounds, short sounds, textural sounds, and pointy sounds. Students then came up with visual symbols that represent these various sounds. Some of these symbols may have a more obvious connection to a sound (i.e.: long sound = long line) while some of the symbols have a more abstract connection to the sounds (i.e.: textual sound = curved lines).

You can see many of the wonderful examples of the symbols created by the Hamilton classroom on the graphic score (see Figure 9).

Curious questions:

1. *If you hear a loud sound, what kind of symbol should represent that sound?*
2. *If you hear a quite sound, what kind of symbol should represent that sound?*
3. *How about a sound that starts quiet and gets louder?*
4. *A short sound?*
5. *A textural sound?*

The answers to these questions are right before your very eyes!

Part 3. Sounds of Objects.

Why do some balls bounce higher than others? Why do some balls make louder sounds that others? Hamilton students learned that it's the ball's materials and construction that cause the varying results of sound and bounciness. Here is a list of the balls used in the recording, and what they're made of:

Tennis Ball: Made of rubber core – felt covering, pressurized gas filled inside

Wiffle Ball: Plastic without a core

Golf Ball: Made of two pieces – rubber core on the inside, plastic on the outside

Baseball: Made of rubber-covered cork core, wound tightly with yarn and then covered with alum leather

Figure 10. Balls used by Hamilton Elementary kindergarten students in their Sound in Motion SDP unit.

The various materials that go into making these balls help create wildly different resonating frequencies when scraped, knocked, and bounced against wood, paper, and aluminum. For example, the hollow, plastic wiffle ball will resonate at a higher pitch than the thud of the yarn wound and leather covered baseball.

"Listen to the sound recording on the cd player. Can you determine the difference between the sounds? Do some pitches sound higher than others? Are some sounds more clearly defined than others?"

Gravity and Energy

When you drop a ball, gravity pulls it toward the floor. The balls gains energy of motion known as kinetic energy. When the balls hits the floor and stops, the energy has to go somewhere. The energy goes into deforming the ball – from its original round shape to a squashed shape. When the balls deforms, its molecules are stretched apart in some places and squeezed together in others. As they are pushed about, the molecules in the ball collide with and rub across each other. Exactly what happens to these molecules as they stretch and squeeze depends on what the ball is made of.

In Conclusion

Figure 11. During a CAPE SDP lesson, Hamilton Elementary kindergarten students work in groups to explore the principles of sound.

During the course of the spring semester at Hamilton, CAPE sound teaching artist, along with the classroom teacher and her kindergarten classroom, worked together to discover and explore various principles of sound. What it is, what it's made of, why we hear it, and maybe most importantly, how to make it!

By using the art of experimentation, the students were able to discover answers to the many questions related to the unit: Why do some objects sound different than others? What properties affect these sounds? Why does sound exist on Earth but not in Space? Why does sound travel faster through water than through the air? Our big idea for the unit is based on how various physical properties impact the dynamics of sound in

interesting ways. It is our hope that this audio and visual exhibit gives you a glimpse into all of the exciting and thought provoking work that went into the project. It's the students who worked on this exhibit that made it such a great success. Their great questions, patience, and creativity made Sound in Motion a unique and exciting work of art!

Figure 12. Parents, teachers, and students visit the Sound in Motion exhibit created by kindergarten students at Hamilton.

Implications and Recommendations

1. CAPE's planning forms were useful as an initial tool for developing an interdisciplinary unit of study, with emphasis on the interests and special areas of inquiry of the teacher and teaching artist. On the opposite end, the online digital portfolio formats provided a space for reflection and a means for communicating the process of what actually occurred in the project, and a way to demonstrate and describe the products produced by the students. Since lessons and activities are not always implemented as planned resulting in changes to the original curricula, CAPE might consider ways to capture the challenges teachers and teaching artists have in doing this work. What obstacles did they encounter that impacted their initial curricular plan? What accommodations did they have to make in order to proceed with the interdisciplinary unit? What didn't work well for them and why? Could something or someone have made it better for them?

2. Professional development is at the forefront of all of CAPE's arts integration projects, even more so in a new program like SDP. In order to more deeply explore the interconnections between music and sound, CAPE made a risky decision in collaborating with a non-musician to lead the SDP professional development efforts – without knowing if the decision would prove to be a successful one or not. This is just one example of CAPE's innovative and progressive manner in which they investigate and further explore a variety of arts subjects in new and interconnected ways. Instead of partnering with a music educator or professional, CAPE brought a specialist in sound arts to provide the foundation for their new area of exploration – an interdisciplinary project connecting academic subjects with music and sound content areas. Although SDP has concluded its third and final year of implementation, it may be possible to include music/sound projects

like these in other programs at CAPE, thus continuing to offer a professional development plan that incorporates more deliberate efforts for encouraging and sustaining the integration curriculum with music, sound, and academics.

3. As an organization, the focus on inquiry is also unique to CAPE. Even their intentional and targeted professional development workshops are conducted using inquiry. CAPE considers themselves to be a learning organization, meaning they don't believe to have all the answers, but are curious and interested enough to learn more about student learning with and through the arts, building teacher capacity and knowledge, contributing to the field through collaborative research, and helping to develop students' social, emotional, and academic skills for a strong future citizenry. Although not a mission of the organization, but as a model for quality professional development in the arts, CAPE may want to consider offering professional development workshops to classroom teachers and teaching artists outside of CAPE, to other arts organizations and school districts, and across the country.

4. A main outcome of CAPE's SDP was the musical learning experiences of students, mostly related to Creating, Composing, and Critical Thinking. The results of this study seem to show that the inclusion of sound arts in the music integration curriculum provided more opportunities for addressing the two least addressed National Music Standards in the elementary music curriculum (Orman, 2002), the creativity standards of improvisation and composing and arranging. Although these standards are related to two National Core Arts Standards, Creating and Performing, it is not possible to directly correlate the use of these standards in the general music classroom to the National Music Standards without having the research to support the use of the Core Arts Standards.

With the more recent dissemination of the National Core Arts Standards, it would be of interest to CAPE to conduct more explicit investigations into how their arts integration units address the Core Arts Standards. Of particular interest are the three specific anchor standards within each of the two artistic processes of Creating and Performing, respectively:

a. Generate and conceptualize artistic ideas and work.
b. Organize and develop artistic ideas and work.
c. Refine and complete artistic work.
d. Analyze, interpret, and select artistic work for presentation.
e. Develop and refine artistic work for presentation.
f. Convey meaning through the presentation of artistic work.

In the CAPE SDP units, these anchor standards were visibly addressed, students engaged in work that reflected these types of activities. New studies drawn from the National Core Arts Standards are necessary in order for CAPE to further compare their work in SDP with how music educators today are addressing these standards.

5. In SDP, CAPE has uncovered an interesting approach to musical learning and music education. The role of sound and learning about sound in conjunction with music studies have given students a different perspective on musical learning that they may not have received in the traditional music classroom. Students' ideas were shaped by their experiences in SDP, many of whom were young kindergarten students. If we disregard the "elitist" mentality that children are talented when they can perform on an instrument well and accept the notion that all children are born musical, then what would be the impact on students if their musical experiences began with an exploration of sound and

focused on addressing the creative, analytical, and descriptive standards? Instead of focusing on skill building and training ears for Western music, what would the music curriculum in the elementary school look like if students composed, improvised, and created their own artistic ideas before they learned to sing or hold an instrument? CAPE should find ways in which to share SDP and use it as a way to help broaden the scope of music instruction in schools today in order to provide a more varied musical learning experience to students.

6. The approach of experiencing music through sound arts seems to be similar to using the Suzuki method where students spend a majoring of their initial musical instruction listening and playing by ear. Approaching music instruction from the onset through listening and discovering sound offers a different way for students to learn and experience music, since in many music classrooms they are first taught to develop a skill on an instrument or voice in order to produce a particular quality of sound that is acceptable for that instrument. As one teacher mentioned, there were sounds that the students produced that the teacher had never heard before. This is a powerful statement especially in a country where music education began for performance purposes of Western music, which delineates a particular scale quality and tone degree. Not all music around the world employ the 12-tone scale, which is used in the United States to determine "correct" tone quality. What about a tone that is produced that falls between D# and E? Students are told to shift up or down so that the tone falls somewhere within our 12 tone scale. Contemporary music, especially atonal music, has not yet evolved to the point that they are heard and appreciated by general audiences. Although studies in World Music exist, it is not highly regarded nor widely accepted as music for general

audiences. In the fast pace global society in which we live, technology has an immediate impact on all we do and is capable of producing a variety of sounds. How will technology help move the study of traditional music instruction into more experimental approaches to music and sound? Will music classrooms become a setting for students to explore, experiment, and create? How can CAPE build on what they have learned in order to confront these challenges?

7. Although CAPE's professional development had enormous value to and changed the perspective of many classroom teachers as they were learning about arts integration and sound arts during the three years of SDP, not all of them agree about the benefits of having students experience music as a process rather than experiencing music as a final product or performance. It could be that they do not yet feel a strong sense of ownership over their interdisciplinary curricula as the teaching artists seemed to demonstrate. Another reason can also be the split dichotomy between those who believe that music in schools should function for entertainment and performance purposes and those who believe that the value of musical learning is in the process of music making. Developing long-term relationships where teacher/artist teams work on multiple units and projects, and continued professional development in order to build teacher capacity are two critical steps in changing teacher attitudes and beliefs and their classroom practices. The Data suggests that, indeed, more time is required to change teacher practices and continued professional development by CAPE will support teachers in these endeavors.

Appendix A
Sample CAPE Planning Form

Planning Form 1

Teacher	Artist
Academic Specialty/Interest	Artistic Specialty/Interest
What areas would you like to develop as a teacher?	What areas would you like to develop as an artist?
Where do you intersect? How might you integrate your interests?	
What over arching themes or topics do your combined interests connect with? What are your BIG IDEAS?	

School

Grade(s):

Appendix B
Sample CAPE Online Digital Portfolios

Name of Project

Name of Classroom Teacher(s):

Name of Sound Teaching Artist:

Name of Music Teaching Artist:

Sound Experimentation as Pedagogy

What is the Inquiry Question and Big Ideas of the unit?

Describe the academic focus of the unit:

If you are addressing a Common Core Learning Standard, include that here:

Describe how you explored music education through sound experimentation this year.
How did your ideas change as the project progressed?

ADD IMAGES/MEDIA RELATED TO THE IDEAS ABOVE

Student Learning

Restate your academic content (non-arts) focus for this unit.

Please describe how sound and music contributed to students' academic (non-arts) learning in this unit:

Please describe how sound experimentation effected students' musical learning experience.

ADD IMAGES/MEDIA RELATED TO THE IDEAS ABOVE

Reflections

How has this project changed the way you think about sound and music as vehicles for curriculum development?

How does the classroom environment change as a result of this sound and music experimentation?
For you? For your students?

Reflections from the Teaching Team

Classroom teacher 1 reflection on the unit:

Classroom teacher 2 reflection on the unit:

Teaching Artist 1 reflection on the unit:

Teaching Artist 2 reflection on the unit:

ADD IMAGES/MEDIA RELATED TO THE IDEAS ABOVE

Appendix C

CAPE SDP Musical Learning Survey 2015

Agreement Scale
1 = strongly disagree 2 = disagree 3 = neither agree nor disagree 4 = agree 5 = strongly agree

"In my SDP unit, it was important for me to..."	1	2	3	4	5
1. Teach the musical elements (rhythm, melody, etc)			2	3	2
2. Teach students to sing properly	1	2	3		
3. Teach music literacy (music terminology, read/write music, etc)		1	2	3	1
4. Improve musical listening skills			1	1	5
5. Teach students a repertoire of songs	3	1	2	1	
6. Teach students to play an instrument	1	3	1	2	
7. Develop and encourage creativity					7
8. Encourage self-expression					7
9. Teach students to be more musically sensitive		1	1	3	2
10. Maintain and pass-on American culture through music	1		4		2
11. Teach students to be more accepting and understanding of cultural differences			3		4
12. Teach students about other cultures		1	2		4
13. Reinforce learning in other subject areas				2	5
14. Make connections with academic subjects				2	5
15. Support thematic units of the regular class				4	3
16. Make it fun					7
17. Provide a break from academics		1	1	4	1
18. Make it simple and mentally relaxing for students		1	4	1	1
19. Students should learn music in order to experience music itself, not because it helps them learn other disciplines.		2	2	2	
20. Students understand connections between music and other disciplines of study when learning about music; it does not need to be explicitly taught.		3	2	2	
21. Students need basic musical skills (i.e.: technical, theory) in order to understand how music connects to the other arts and content areas.	1	1	2	2	1
22. Experiencing music as a product (performance, culminating event) is most beneficial for students, rather than experiencing it as a process.	1	4	1	1	
23. What students learn (musical content) is the best way for students to experience music.			7		
24. Experiencing music as a process is most beneficial for students.		1		4	2
25. How students learn (type of musical experience) is the best way for students to experience music.			4	3	

26. Students benefit most when they engage in music experiences that help them reveal cultural and societal values.			2	2	3
27. The best musical learning experiences are those that help students gain individual knowledge in improving their human condition and quality of life.			1	4	2
28. Students experience more profound, spiritual, emotional, and meaningful music when they have higher levels of musical skills.		1	3	3	
29. Music is personal in that it encompasses mind, body, and feeling.			1	3	3
30. Music is a universal need or practice.			1	2	4
31. Arts and academic content is clearly identified in my arts integrated curricular work.			1	4	2
32. Learning skills (arts content, academic content, 21st century skills, etc) are clearly identified in my arts integrated curricular work.			2	2	3
33. I identify primary research/inquiry questions in my arts integrated curriculum.			1	3	3
34. I engage students in a variety of hands-on approaches to help in generating and representing new knowledge.				4	3
35. I expect students to draw on field research from resources in their communities outside the school.			2	4	1
36. I utilize assessment methodologies for student learning in my arts integrated curricular work.			3	3	1
37. I provide opportunities for students to reflect on their work with their peers.				6	1
38. I provide opportunities for students to make presentations about their new knowledge or to teach what they have learned to others.			1	3	3
39. I have observed that parents and parent organizations have a clear commitment to and involvement in the work of the partnership.		1	5	1	
40. I have significant contact and on-going collaborations with the teachers at my schools.			2	3	2
41. I have seen evidence of increased teacher capacity to develop and implement new teaching strategies as a result of their work with the partnership.			3	3	1
42. I have seen evidence of new and productive collaborations between teachers as a result of their work with the partnership (peer mentoring projects, team teaching, co-planned cross-class curricular projects, etc.).			5	2	
43. I use rigorous formative self-assessment and on-going planning in my partnership activities.		1	3	2	1
44. I use the SDP as a way to teach another content area or in service of another curricular area.		1	4	2	
45. I use the SDP as a way to change the mood of the classroom, to build self-esteem, or to help develop creative expression.			1	2	4
46. I use the SDP as a way for students to participate in school or community events.		1	2	3	1
47. I use the SDP as a way to teach music/sound and a non-arts content area equally, giving them the same importance level.		1	1	4	1
48. I use a central theme, big idea, or shared concept as the curricular subject across both music and non-arts content area.				5	2
49. I plan and implement integrated arts curriculum with an in-school arts specialist.	1	1	3	2	
50. I plan and implement integrated arts curriculum with a classroom teacher.		1	1	1	4

Appendix D

Sound Design Project Year 3 Exhibition Worksheet

School/ Teacher	SPACE	CONTEXT	RELATION TO WORK	FINISHED WORK	PROCESS	OBJECTS AND ARTIFACTS	SOUND AND MUSIC	STUDENT INVOLVEMENT
Alcott	Ideally a white neutral room-like a traditional gallery.	Stories from around the world as connected to world religions.		A large world map with numbers on the map which connect to the students' audio pieces. The audience can choose which audio piece to listen to. There will be books with the stories and visuals as well.	The students will choose stories in groups. Then they will create recorded audio pieces.	The actual stories. Visual collages as connected with one stories.	The students can choose whether they want to make a music soundscape or spoken world pieces.	They will create the audio pieces and visual collages.
Barnard	Different parts of - School depending on recordings. Elevator foyer. Hallways, classrooms, bathrooms, auditoriums, artside, different times of the day.	Students are learning to adapt to various environments in school. Awareness of expected behavior wherever they are.	How each student views their view of adaptation to environment.	diorama / recording - >Museum	I do: demonstrate desired behaviors. We do: brainstormings, demonstrating. You do: working with artist/teachers. - recordings	Journal, stories of paper, carlum, IPads, video, maps, audio.	Listen to different sound making, to focus attention, develop soundscape/ music compositions, practice rhythms with instruments.	Recreation of soundscapes, students will be recording, participation in sound walls, Student reflections, students will be creating diazns, Choosing choice of artifacts, Listening.
Hamilton #1	Will account for acoustics of space - will determine volume of sound of recording the larger the space or room - the broader the project	Room/space will impact the project physically.	The acoustics of space are essential to realizing the potential of the exhibit.	Exhibit will include both visual & audio components. Installation.	Students will rec... into to sound. Into to graphic repres. Science integration - > physics of balls/sounds. Science/CAPE project->creating audio piece using balls & graphic piece based on audio	Balls - different sizes, weights, plates, bowls, fabrics, alum foil	Each small group will perform using materials while following their score.	Students will: create bouncing objects with various properties that impact sound created when dropped/rolled. Assist in creating graphic representation.

Hamilton #2	Classroom (lesson + research). Gym or cafeteria (exhibition of projects. Group displays/sound booths).	We need an open space that can be divided into smaller areas that stay connected. Connect booths with bigger weather piece - all groups recordings together, played at random.	An open space with our dividers will provide a neutral backdrop. A large space allows for kindergarten & 3rd grade to join together.	Group visual displays (weather focus with a connection to sound. Diagram/ illustration). Audio recordings (original pieces by small groups depicting weather event).	Students divided into groups and assigned a weather-related theme to research, analyze, and imitate. Information gathered will be used to compose sound piece and visual display.	For Exhibition : recorder, headphones, audio player, sound booth materials, display board, "instruments"	Sounds occurs naturally, sounds can be made to mimic natural sounds, traditional composition techniques, and analyzation of music can be applied to sounds made by objects/ non-traditional instruments.	Creating the visual displays and audio recordings, Selection of objects used in audio piece.
	Dark enough for projection (or screens), Black wall space for mounting photos. Projection can also be "public" by having displayed in a hallway, etc.	Partially accessible to other classes/age groups in a neutral space at school (not a classroom).	Class projects documentation. Edited video including sound portraits and recordings.	A 4-paut installation with photos, video, and objects/sculptures.	Exhibition materials are artifacts from class. The media will reflect projects recorded in-class.	Projection or screens. Objects used by students for the final composition. Recorder, 8 headphones, 8 MP3 players, Poster boards/panels.	The "final piece" will be conducted music. The sound portraits are a display at the students' chosen sounds, but not in a musical form.	Kindergarten students will not be involved in the installation process.
	Final piece/exhibition - 4 groups (1 conductors) x 2 classes = 8 listening,(each with group photos). 1 group sound portrait video x 2 classes = 2 screen or projection. 1 documentation panel x 2 classes = 2 boards or walls (minimum). Production for exhibition - Zoom recorders, 2 screens (or projectors), at least 2 boards, priated photos, 8 MP3 players, 8 headphones. Listening station to include: piece title, participants (and name of group), Conductor. The content of the exhibitions displayed in two parts: Sharing of configurations o students: Individually sharing a sceen and object, Assigned conductor creating a piece with their classmates.							

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