

**One Size Fits Few:
Jazzing Up Classroom Lessons to
Integrate Multiple Learning Styles**

Laura Sluboski and Priya Poehner

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It is of utmost importance that we recognize and nurture all of the varied human intelligences, and all of the combinations of intelligences. We are all so different largely because we all have different combinations of intelligences. If we recognize this, I think we will have at least a better chance of dealing appropriately with the many problems that we face in the world.

- Howard Gardner

Theoretical Constructs

What are multiple intelligences and how do they impact classrooms that are gearing up to meet the stringent requirements of the state mandated tests? The National Research Council (2002) identified the paucity of scientific research in educational fields. They elaborated on the importance of having empirically based, data- driven research that would in turn address the myriad needs (“low performing schools, the “achievement gap”, and language diversity”) within our nation’s public schools. This data should then impact the way in which we teach and assess students. As with others who teach in public schools, SCASD is also feeling the pressure that the mandated standardized testing has placed. Our units are being revised to allow for more explicit instruction on the items that are seen on these high stakes tests. What then could be the role of providing students with multiple ways to engage in and “learn” the material taught while still teaching the essential elements? Can this be done? One could argue that not only is this method more effective in later retention (as the material has been concretized), but also provides students with greater motivation to participate in the lesson.

As we began the school year, we quickly realized that we had a very diverse group of students with a variety of needs. In critically reading the plethora of research on the effectiveness of utilizing a multiple intelligences framework, we realized that it was essential to integrate the various strengths already present within the classroom into our daily teaching practices. We also discovered earlier on, that our classroom was made up

of students who in spite of possessing very strong non-academic skills, struggled with many of the basic academic tasks with which they were presented. This early observational and therefore (arguably) scientific data drove our inquiry into the use and impact of multiple intelligences into daily lesson planning and implementation.

The term, “multiple intelligences” was coined by Howard Gardner (1983) in the attempt to broaden the concept of intelligence to include the diverse abilities that people possess. The original theory identified seven intelligences, although more are being added to encompass the variety of strengths that are observed in people. Gardner identifies intelligence as the ability to solve problems and make things within a specific contextual and natural environment. The eight intelligences that are utilized in this paper are as follows: linguistic, logical-mathematical, spatial, bodily-kinesthetic, musical, interpersonal, intrapersonal, and naturalistic. Brief descriptions of each of these intelligences are enumerated below:

- Linguistic – This intelligence looks at the utilization of words in speaking, reading and writing. Students who portray this intelligence are good at word sorts, crossword puzzles, grammar, spelling and have an elaborate vocabulary.
- Logical-mathematical – Children who portray this intelligence use numbers effectively and are good at logically solving problems. They are good at analyzing situations and looking for patterns and playing mental computational games.
- Spatial – Children who are sensitive to colors, line, shape, form and space are strong spatially. They are able to visualize pictures and then transform them into

- two and three-dimensional models. They often like to doodle while listening or speaking and are good at manipulating materials to form interesting objects.
- Bodily-kinesthetic – Children who have specific physical skills such as dexterity, balance, speed, strength, flexibility and both large and fine motor coordination are strong in this intelligence. This intelligence is also tied to the spatial intelligence and are often also good at working with their hands.
 - Musical – These children are able to use, transform and express themselves using music. They also have a great sense of rhythm, pitch or melody, tone and color of a piece of music. These are also the students who seem to enjoy listening to music, hum to and seem to move to an internal beat.
 - Interpersonal – Students who display strong interpersonal skills have close relationships with others, like to talk and interact with others, pay close attention to feelings, temperaments, body language, other's motivations and interests, voice levels, and gestures. They are also very good at making friends and helping others reach a common goal.
 - Intrapersonal – Children with strengths in intrapersonal skills are very self-aware (of moods and desires), reflective (have an accurate sense of own strengths and weaknesses), self-disciplined and have a high self-esteem.
 - Naturalist – Children who are naturalists are interested in the environment (plants and animals), sensitive to aspects of nature such as weather, biomes, food cycles, etc.

From the above descriptions, it is clear that every person has a variety of strengths (ways in which they make sense of the world). However, it is also clear, that they can change (and grow) with experiences that are outside their immediate intelligences.

Classroom Environment and Background

The dynamics and make-up of a classroom greatly impacts the interactions that take place within it. Therefore, this is the starting point for this year's journey through inquiry. We began with the intent to actively engage our heterogeneously grouped classroom of twenty-four fourth graders. As the year progressed, two of our students moved to other schools and districts leaving us with twenty-two remaining children. A focus in our classroom has always been to bring a creative spin to lessons and activities to encourage students to move through the learning process. Our class has such a large range of learning abilities (from gifted, to average, to learning disabled) that it can sometimes be a challenge, as in many classrooms, to get all students engaged and to actively participate in developmentally appropriate lessons. The following is a description of the learning and behavioral trends present in our classroom.

Our classroom is currently comprised of twenty-two fourth graders, twelve boys and ten girls. While our students can often be very productive, they do have trouble staying quiet during seatwork due to a high level of social tendencies. They focus a lot of their attentions on conversations with their teammates while attempting to work, which can be distracting for those students who have difficulties multi-tasking. Most of our students are able to demonstrate 'appropriate fourth grade behavior', such as raising their hands to be called on, staying seated during seatwork, not calling out, etc. The boys and girls in our classroom are at the age where they are able to work together well, and do not

have a problem working in mixed groups - and in fact enjoy doing so. While there is still segregation based on sex on the playground, the students play and interact well together during some activities. The heterogeneous mixture of our classroom encourages a cooperative work environment, where students become teachers in times of need.

On the whole, our class is achieving at grade level or above. Although this is the norm in our room, we have two students who are slightly socially withdrawn, and as a result do not converse or interact with the other students in our classroom. These students also need to be coerced to participate in whole group activities. We also have four title-one reading support children, who are grouped together in an instructional reading group. One student, who receives Instructional Support, leaves the room during Language Arts and Math. In addition to this child, two others leave for math to receive extra support. For math, our classroom has five level appropriate instructional groups in place. Our students' work in these groups for two days out of the week, and the remaining three days receive whole group reformed mathematics instruction. We have three gifted students who are on the fifth grade math level, and are accelerated in the other subjects as well. They perform extremely well in all academic areas, and are able to work well as peer tutors with others below their level.

The PDS program encourages high levels of critical thinking, including the process of inquiry. As an intern (throughout this yearlong internship), we pursued ways of engaging students through creative lesson planning. Howard Gardner's Theory of Multiple Intelligences is closely linked to both our teaching philosophies, and as a result focused on creating lessons that included the eight intelligences. Last year, Priya used drama to incorporate elements of multiple intelligences theory into the classroom.

However, this was not a reality for the time frame of the inquiry project, due to the many snow days that had accrued. As a result, we were interested in investigating other methods of providing students with lessons that speak to their individual intelligences. Since our classroom was too broad a data set to focus on, we concentrated instead on the development that we observed in the five students in whom we were concerned or intrigued by at the beginning of the year. We documented both the quality and quantity of time that they spent engaged and on-task during classroom lessons and assignments. For the purposes of this inquiry, the five students we chose exhibited a range of abilities and motivation for classroom activities. Two of these selected students were not actively engaged in the ‘typical’ reading, writing, and math activities, but seemed to be more involved when material was presented in a more creative way.

At the beginning of the inquiry process, we had many initial wonderings that eventually led to our project topic and questions. Some of our meanderings were about teaching, standards, students and multiple intelligences such as:

- What is the benefit to incorporating multiple intelligences into a lesson?
- What do students gain from lessons that encompass their multiple intelligences?
- What are the various multiple intelligences, and how can they be incorporated into a typical classroom lesson?
- Would teaching using multiple intelligences be a manageable task, or would we need to duplicate our instruction?
- How would we go about teaching this way?
- How can math and Language Arts be taught using multiple intelligences without shying away from essential key concepts?

- How can we, as teachers, better assess the needs/strengths/interests of our students through our lesson plans?
- Will teaching through multiple intelligences result in better motivated and engaged students?

After considerable thought and collaboration, we narrowed our plethora of wonderings to a few focused questions. Our inquiry therefore focuses on the following questions:

1. *How can the inclusion of Howard Gardiner's Multiple Intelligence Theory in both the creation and implementation of lesson plans, affect five students' quality of work and engagement in classroom activities?*
2. *How can we align classroom practices that utilize multiple intelligences to the Pennsylvania State Standards?*

The Process

While we have always had a passion for utilizing the multiple intelligences theory when planning our lessons, it was never something that we did on a daily or even a consistent basis. While we saw the value in incorporating multiple intelligences into our lessons, but we were unsure of exactly how they should be incorporated into the lesson planning process. We also had the assumption that jazzing up classroom lessons requires much more time and effort. In order to incorporate multiple intelligences into our own lessons, we developed a modified lesson plan rubric, which includes a chart where we could check off, write a brief description along with how that intelligence is included in the lesson. For example, Linguistic Intelligence is described as: *"The capacity to use words effectively, whether orally or in writing."* The questions that follow are: *How can I include reading, writing, and speaking in my lessons?* See **Appendix B** for the multiple intelligence lesson plan.

Once the lesson plan rubric was created, we then went on to plan and implement lessons that incorporated a variety of multiple intelligences. During the second unit of study (*Festival of the Arts*), we took turns teaching lessons on different genres of music. We would like to provide the reader with a sense of a modified lesson that incorporated the multiple intelligences? After suggestions from other teachers on our team, we planned a lesson titled Rock N' Roll Jeopardy (based on the TV game show, Jeopardy), in which we attempted to incorporate all of Gardner's intelligences. See **Appendix C** for the rock n' roll lesson plan. For this lesson, our goal was to create a lesson in which students would be motivated and engaged. Prior to this lesson, we had always considered Jeopardy to be a game suited for an assessment tool; for it is a great, interactive way to gauge student learning on a given topic. Neither of us had the experience of teaching the game as an introductory activity before and was surprised at the results.

To make this a cooperative game, we had the students work in their teams to answer the questions provided. Each team got a chance to roll the giant foam dice and answer a question (geared toward various multiple intelligences) based on the category they selected. We created six categories for our game, which included: Elvis, The Beatles, Female Artists, Miscellaneous, Name That Tune, and Rock Performance. For the category of Rock Performance, each team came up to the front of the room, used supplied instruments, and sang the song to the rest of the class. Through careful planning, we were able to incorporate all eight of his intelligences. The following are examples of questions or aspects of the game that incorporated the various multiple intelligences:

- Logical/mathematical- The Beatles came to The United States 40 years ago, what year did they arrive?
- Natural- Use the clues in this picture (a collage of natural beach scenes) to answer the question. Clue: These ‘boys’ spent a lot of time at this location, they are...?
- Bodily/Kinesthetic- Pretend you are a rock band and are performing for your audience. You need to sing and dance to the rock song that will be played.
- Interpersonal- Work with your teammates to answer the questions.
- Intrapersonal- Write a reflection of what you have learned from participating in Rock n’ Roll Jeopardy.
- Verbal/Linguistic- Students had to orally answer the questions posed to them.
- Musical- The entire game was focused around musical knowledge and appreciation and rock performances.
- Spatial- Draw a picture of “The Beatles” in your portfolio.

For this lesson, we decided it was simply not enough to be at the front of the room asking questions, for we wanted to be engaged in the lesson as well. As per prior observations, we deduced that the more enthusiastically we presented the material, the more engaged and excited our students would be. Therefore, we dressed up as ‘rock chicks’ from different time periods and played our part. We did not want our students to be the only ones involved in the lesson, and did our best to be as excited about the information as they were. This was accomplished through changing our pitch while asking questions, dancing to the beat of the music, and encouraging the students to do the same. Priya videotaped this lesson so that we could go back later and closely observe the true nature of the student interactions.

As a follow up to this lesson, the students then had to complete their Rock N' Roll CDs in their *Festival of the Arts* portfolio. For this activity, the students listened to selected music, and completed various writing and drawing activities. We tried to incorporate both writing activities that focused on areas of grammar as well as thought provoking questions. For example, we listened to John Lennon's *Imagine*, and the students were asked to close their eyes, listen to the words, and draw the emotions this song made them feel. For The Beatles' *Hello Goodbye*, they were to write down as many antonym pairs they could come up with, both from the song and on their own; and for Joni Mitchell's *Got Till It's Gone*, they drew a picture of their ideal paradise. This lesson touched on five of Gardner's intelligences: spatial, intrapersonal, interpersonal, musical, verbal/linguistic. See **Appendix D** for the lesson outline. The case study students' work can be found in **Appendixes I-M**.

As mentioned earlier on, these are just a few lessons that were planned during the inquiry process. As the *Festival* unit came to an end, we focused our attention on four more lessons, two involving paintings and two more writing activities. Each of these lessons addressed six of the intelligences: math/logical, spatial, intrapersonal, interpersonal, bodily/kinesthetic, and musical. Lessons like these continued through the *Festival* unit, and into our third and final unit *Journey Through Japan*. We looked closely at student objectives, standards and multiple intelligences addressed for each lesson. As a reminder, while the lessons were being taught, special attention was paid to our five case-study students. Their work was examined more closely at the completion of the lessons, in order to judge quality of work and growth. See **Appendix E** for a few of these lesson plans.

Methodology

In order to get an adequate grasp on how our students were affected through the implementation of these lessons, it was important to use a variety of data collection methods to confirm our impressions. Just as a scientist with a hypothesis, it is imperative to have strong evidence to support the claims. Therefore, the more diverse the methods of data collection we used, the more authentic our claims could be.

Student Surveys~

Our first method of data collection was the student survey given at the start of our project. We thought this would be a useful tool to adequately gauge the perceived interests and strengths of all our students, but the five students in particular. We presented the survey to the whole group at the beginning of the process, but gave it to just the five focus students at its culmination. The assessment consisted of categorical questions (where the students placed a check next to a statement which applied to them) for each section of multiple intelligences. See **Appendix A** for initial survey, and **Appendix F** for final survey results.

Lesson Plans~

An obvious method of data collection for our inquiry project was lesson plans. As our inquiry focused so heavily on tying in multiple intelligences to classroom practices and lessons, planning was an essential ingredient. Formalizing the lesson plans helped us to think through and ensure that we were approaching the lesson in the way we wanted. As described earlier, a template for lessons that use multiple intelligences was created early on in the process. This was later modified to include student objectives, standards addressed, and the multiple intelligences attended to in the lesson. We found

this to be an easier way of organizing the information, and thereby kept each lesson to one page of data. Each lesson included different intelligences, therefore we chose to focus on a just a selection for the purpose of this study. See **Appendix G** for a compilation of our modified lesson plans.

Videotaping of lessons~

For a few of the lessons, videotaping came into play because it would have been nearly impossible to attend to the five students during the lesson. This way, the focus of the lesson could still be on the content, and then afterwards we could analyze the tapes for appropriate data for our inquiry project. While this method proved to be slightly more time consuming, it was very valuable, for it allowed us to pick up on small behaviors, body gestures, and comments that we may have missed otherwise.

Teacher journals~

Teacher journals are central to the PDS internship. It is expected that interns are completing a minimum of one journal entry a week, which is then sent to their PDA. Journals are an excellent opportunity for teachers to reflect on lessons and classroom practices. Journals were therefore used to reflect on student performance and effectiveness of the lesson. See **Appendix H** for teacher journals.

Teacher observations and anecdotal notes~

As mentioned above, teacher journals are an essential source of information that provides the reader with a sense of the emotions that a teacher is experiencing through her reflections. However, it is also just as important to have ideas or observations while the lesson is taking place. There is a greater chance of catching important facial expressions and comments shared when there is someone to make observations. We paid

attention of time our students spent on task and participated in the lesson. The anecdotal notes are included in **Appendix H** with the teacher journals.

Student work~

Seeing the progress and growth our students were making was a component of our inquiry project. By assessing the quality and quantity of work produced by the students we were able to assess what each of them had learned from students' work from the lessons being presented in a non-traditional way. See **Appendixes I-M** for student work.

Data Analysis

After the lessons were taught and student work was collected, it was time to begin to analyze our data. We reviewed our tapes, read through our own materials, and looked more deeply at our five students' work. Patterns began to quickly emerge, and it was clear that each of our five students showed tremendous growth through their deeper involvement in classroom activities. Critical thinking skills were greatly increased through these lessons, which was evident in students' work. In addition, while analyzing the data we collected, we learned that:

- **Teaching through multiple intelligences increases student motivation and thereby time on task.**
- **Contrary to popular belief, integrating multiple intelligences into lessons addressing state standards is manageable.**
- **Exploring both student strengths and weaknesses while planning and implementing lessons results in a higher quality in student participation**

- **Teaching through multiple intelligences enhances students' critical thinking and application skills.**

Each of these claims is supported through evidence integrated into the case studies presented below.

Case Study 1

The first student involved in the inquiry project is Joseph. Joseph is a very social student and likes to constantly talk and socialize both with the teacher and other students. He is an extremely lovable student who has an amazingly large heart. He always thinks of others, and gives helpful suggestions to the teacher as well as the other students. He is fidgety by nature, and has a difficult time sitting still both at his desk and on the carpet. Often times when he talks, he either rocks back and forth, or steps side to side. Work completion is a challenge for Joseph, because he has a hard time sitting for long periods of time without getting distracted. He is not a consistent worker and his attention span could be defined as being sporadic. There are times when he is “on” and will stay focused on the task for the entire time, while at others needs constant reminders. We discovered that the use of a kitchen timer during independent work keeps him more on task as he has a short goal to work towards.

In the beginning of the year, Joseph was a very antsy student who had trouble focusing - sometimes even on the simplest of tasks. Through the introduction of music, arts, and movement, Joseph was able to increase his time on task. Music became a motivator for Joseph. He began to sing along to musical tunes while working. Music would only be played for the class if it were agreed upon that it would still be quiet work time. If the students' voice levels began to rise the music would therefore be shut off.

With this warning in place, Joseph knew that he would need to stay on task, otherwise his motivator would be turned off.

Joseph's critical thinking skills emerged more clearly through the Festival of the Arts unit. During the Van Gogh painting lesson, he began to ask questions and experiment with paints in an attempt to copy *Starry, Starry Night* as accurately as he could. Throughout the lesson, he made comments such as: "*I wonder how Van Gogh made the stars so swirly?*" After this wondering, he continued to experiment with different artistic techniques for more than forty minutes. This was one of the first times during which Joseph stayed on task throughout an entire lesson. The more hands-on and multi-modal the activities became, the more he stayed on task. He began to verbalize his excitement with the new knowledge he was gaining from classroom discussion and activities.

For a student who had trouble staying on task during Language Arts and Writer's Workshop, it was interesting to see Joseph's language develop through the introduction of poetry. Joseph has an innately creative poetic language that emerged during these lessons. For the *Journey Through Japan* unit, the students went outside to observe nature using the three senses: touch, sight and hearing. The first prompt was to have the students take "pictures with their eyes" with a partner. They were instructed to pay close attention to the details of nature, which they were being guided to notice. Joseph was very descriptive and detailed (paying close attention to minute features) with his observations. When it was time to write the poem, Joseph sat right down and got to work, and produced one of the best haiku poems in the class. It was exciting to read the vivid metaphors he included in his haiku, which is as follows:

*Slimy, sticky slug
Swinging on a twisted vine
Green gak dripping down!*

Joseph began to shine as an excellent science student throughout the past few months. As our science curriculum is based on the concept of inquiry, the lessons lend themselves to hands- on experimentation. As a result, this was an area in which Joseph excelled. The lessons in this unit are very complex, and require the students to think critically about the properties of air. During a lesson involving an air bag, Joseph was the first student in my class to shout out, “*WOW, air is REALLY strong!*” By engaging students in lessons where they acquire the key concepts and ideas, they are more motivated to produce their best work and feel accomplished. Joseph felt gratified and motivated, which in turn positively affected his time on task in Science, and even across other areas of the curriculum.

It could be argued that Joseph’s strengths were in musical and interpersonal intelligences. When Joseph was asked to sing or even when he was working, he was motivated by the music that was in his head or played aloud. He also performed better when he was given the ability to talk to another person (whether it be student or teacher) about his ideas prior to writing them down. This was further emphasized in the final survey that he took. He rated himself higher in sections 2,3, 5, 6 and 7, which were the sections on the musical, logical reasoning, interpersonal, bodily-kinesthetic and spatial areas of intelligence. It was also observed that both Joseph’s and our impressions of activities that he was able to participate in changed as a result of his involvement with the multiple intelligences.

Case Study 2

The second student selected was Adam. Adam is another very social student. He often focuses his energy on objects and activities that do not directly relate to the task at hand. He receives learning support for Language Arts, and will officially be picked up for math in the upcoming school year. Adam was also tested for ADHD mid year due to his impulsivity and inability to stay focused on a task. Adam is the type of student who, like Joseph, can attend to activities and lessons sometimes, but not others. He can also be found playing with objects that may be in his desk or pockets.

After analyzing Adam's pre-assessment, it was clear that he saw his greatest strength area to be his musical abilities. Adams has an innate love of art, so by tying music and art together, we were able to get Adam to stay on task, which was amazing to see transpire throughout our lessons. For example, during a lesson where the students were asked to jump into a painting, and create a poem with what they saw and felt, Adam was able to actively engage in this lesson throughout the forty-five minute writer's workshop time period.

It became clear, that Adam had many great ideas in his head, but often found it difficult to write these ideas down on paper. Allowing the students to draw their thoughts and ideas in their Rock N' Roll CDs, allowed for Adam to finally communicate his in critical thinking skills. For John Lennon's *Imagine*, Adam drew a beautiful picture of himself standing on a rock cliff looking out into a vast landscape. When asked about this drawing, Adam shared the following statement, "*I just felt like the song was about imagining what life could be life...if there were peace. That is what I am doing in my picture.*" It is inspiring to see the quality of work that can result, by simply giving

students like Adam an instructional an assessment tool that utilizes a different intelligence, just as spatial and bodily/kinesthetic intelligences which involve drawings and movement, instead of the more traditional writing assessment tools. Adam's entire *Festival of the Arts* portfolio exhibited his true capabilities as a learner. For the first time, Adam had a complete portfolio with quality work. His poetry includes metaphor, similes, and vivid imagery. For example, Adam wrote the following poem to describe a banana:

*On the outside,
You look like a yellow canoe.
When I peel you,
You sound as quiet as a shadow.
When I slice you,
You sound like a bird
Inside you look as gooey as muck
You feel as squishy as oobleck.
You smell like air,
Because you don't have any odor.
You taste as disgusting to me as spinach.*

See **Appendix J** for copies of Adam's work.

Adam has become quite willing to participate and engage in lessons that involve the artistic intelligences: bodily/kinesthetic, musical and spatial. The class was recently asked to create a pictorial story map for the book *Wild Horse Winter*. Adam was the first to speak up in his group, proclaiming, "Can I do the drawing, cause I love to draw!" His group agreed that Adam could complete the drawing portion of this assignment, which he did throughout the Language Arts time frame. This vignette alone helps to exhibit Adam's growth over this year, for he would have had a difficult time actively attending to nearly any lesson for that length of time in the beginning of the year.

Adam's perception of his abilities and strengths also changed as a result of his interactions with the multiple intelligences. He saw his main strength at the beginning as

being in the musical domain and did not see himself as a very strong spatial thinker.

These areas were graded much stronger in the final survey. However, an area of strength in which he made a significant change was that of interpersonal intelligence. Adam saw now that he was a “team player” and that “he learned best when he was interacting with others”.

Case Study 3

The third student we observed for our inquiry project is Ashley. Like the previous two students, Ashley is also a very social student, although her desire to talk and socialize with other students does not infringe on her work habits. She is usually one of the first students done with her work. In the beginning of the year she expressed an extreme desire to participate in activities involving music and drama. Ashley is both in our top reading group, and our top math group, excluding those three students who are on the 5th grade math track.

Ashley is the type of student who most teachers do not ‘worry’ about, for she is self-motivated and can get her work done in a timely fashion. Often times, students like Ashley do not get encouraged as much because they are already achieving at or above grade level. Our inquiry project helped to show that by teaching lessons that hone in on different intelligences, the quality of work and engagement time of even the brightest students could be heightened. Ashley’s work, especially in the poems she has written, has improved in the depth of ideas and creativity. For her “jump into a painting” poem, she wrote a free verse poem that revolved around Picasso’s *Demented Boy*. She is more willing to experiment with new techniques and ideas than she was prior to the commencement of this project. While she is a student that is normally engaged, it is clear

from her facial expressions, number of times her hand is raised, and overall enthusiasm, that she is more willingly and deeply engaged during lessons that involve movement, team participation, music, and craft activities than those that do not. See **Appendix K** for copies of Ashley's work.

Her motivation and involvement in lessons throughout the curriculum has drastically improved. While she was always willing to participate in classroom activities, her hand now shoots up at nearly every question asked. The spark on her face is so bright during lessons, which incorporate multiple intelligences. After analyzing the Rock N' Roll videotape, it was amazing to see her facial expressions during the rock performance. It was clear that Ashley was enjoying herself. Prior to this lesson, we had studied Jazz and Classical music, both of which Ashley did not show much interest in. Now, music is a part of her daily routine, which can be attributed to the way in which the information was presented to her. By making the lesson fun, interactive, and creative, though addressing the bodily kinesthetic, intrapersonal, spatial and musical intelligences, students like Ashley can become even more engaged. Even students who are achieving at or above grade level still need to be pushed to excel to their level, and by incorporated multiple intelligences, that hit on students' areas of strength, this can become a reality.

Ashley has emerged in our classroom as a critical science thinker. Prior to our inquiry project, a science lesson was presented in the form of a movie, where at its conclusion, students were expected to understand static electricity. Ashley did not comprehend this video, and made it quite clear to the class that static electricity did not make sense to her. Realizing that a video was not the best way to present new information to the class, we began inquiry-based science lessons to help the students

grasp the properties of static electricity. By having the information presented to her in this new way, allowing her to become the teacher, by experimenting with materials, Ashley was able to comprehend static electricity. When asked if static electricity now made more sense to her, she responded with, *“After watching the video, I just didn’t get it. There were too many words that I didn’t know. But after doing these experiments, and getting to see static electricity, it makes more sense.”* By simply reworking a few science lessons, and posing questions to our students, instead of handing them the information, students like Ashley are able to think critically about the given topic, and learn from their own experiences.

Case Study 4

Jesse is the fourth student we chose to observe. Like Ashley, Jesse is one of our top students, in both Language Arts and mathematics. He is one of the three students in our classroom receiving fifth grade math instruction. Jesse usually does not have a tough time focusing on tasks at hand, but often his work is not of the quality that he has the ability to produce. While he enjoys socializing with other students in the class, he often is quiet during independent work time. Jesse enjoys hands-on projects and activities that involve problem-solving skills. He volunteers for extra work, and problems that help to stretch his mind.

Jesse’s quality of work does not always reach the standard he is capable of. Prior to our inquiry project, we often found Jesse’s work to be sloppy, and not detailed. Through the introduction of multiple intelligences, we have found other ways of assessing student knowledge. Jesse’s Rock N’ Roll CDs are inspiring. For John

Lennon's *Imagine*, Jesse drew himself staring at the night sky, watching shooting rainbow colored shooting stars. By giving him the opportunity to draw what he was feeling and thinking, instead of simply asking him to write, Jesse was able to develop in depth thoughts in a meaningful way. See **Appendix L** for copies of Jesse's work.

During the pre-assessment, it was clear that Jesse saw himself as having strengths in all of Gardner's eight intelligences. After discussing the assessment with him, we thought it would be good to explore his love of nature, with the observation haiku lesson, briefly described earlier. Jesse was able to use vivid descriptive vocabulary, which transformed into two well-constructed haiku poems. See **Appendix L** for Jesse's poems. Jesse has developed into quite an artist and poet in our classroom. His observational haiku poems are as followed:

*A swirly one-eyed
Ugly tree troll watches us
Play outside today*

*Splintering like sharp
Knives, piercing delicate skin
While it erodes*

While Jesse has always been a good thinker in our classroom, through hands-on inquiry based science lessons that address different multiple intelligences, such as, bodily/kinesthetic, intrapersonal, interpersonal, spatial, verbal/linguistic, and mathematical/logical, he is able to think more critically about concepts and abstract ideas. All of our science lessons involved time to move around, discuss ideas with groups, self-reflection, and required students to develop spatial awareness and linguistic capabilities. Jesse was able to thrive in all of these intelligences, and has learned to question and probe for further understanding. For example, during a lesson, which involved the creation of

an electrical switch, Jesse worked with two other students in our classroom to create a triple-switch, which went above and beyond the question posed in the lesson.

Case Study 5

The final student involved in the inquiry project is Kara. Kara is one of the more reserved students in our classroom. While she does have her group of friends, who are mainly girls, she does not spend a large amount of class time socializing. She is good at staying on task, and does not have a problem finishing her work on time. In the beginning of the year, she was hesitant to participate and volunteer her thoughts and opinions, especially in the subject of science where the ideas and concepts are slightly more abstract.

In the fall of this school year, Kara was a more reserved student who did not often participate in large group activities. To get her to share her ideas, we would often have to call on her during a lesson, for her hand would not be one often raised. Now, after the completion of these lessons, her hand goes willing into the air in nearly every subject, especially in Science. She is able to share her ideas involving scientific thought, which often involved learnings and evidence from our experiments. Kara had the following to share during an experiment involving moving air and a wind tunnel, *“The air above and below the wing is just like when we pushed on the wall in the hallway. The faster we pushed the less we could push on the wall. The faster air is on top of the wing, and it doesn’t have enough time to push on the wing. The slower moving air is on the bottom, so it has time to push, because it has more pressure.”*

Kara has blossomed over the past few months in our classroom. It all began with the Rock N’ Roll Jeopardy lesson. For someone who we both considered to be shy, she

got up in front of the whole class and was the leader in her group's rock performance. Kara took the lead in The Supreme's *Stop In The Name Of Love*, creating hand motions that went along with the words she was singing. From this point forward, we tried to encourage her artistic and musical side. We found that she was able to work more consistently when we allowed music to be played in the background. We would often find her bopping her head to the beat of a song, and lip-synching along with it, as she completed her work. Kara's quality of work has also improved drastically over the past few months. She has put more time into her work, paying special attention to the details in her writing. Music has helped to enhance Kara's classroom presence, and to bring out her academic abilities. Please refer to **Appendix M** for copies of Kara's work.

Conclusion and Implications for Future Research

While the primary focus of our inquiry was on the five students selected for our case study, the value of these lessons has affected our entire class. Music has become a motivator and behavior modification tool in our classroom. Students are allowed to have music playing in the background as they work in their team, or on independent work and as long as the noise level is kept at a reasonable level, the music will stay on. The most requested CD by all of our students is the Rock N' Roll CD used in the Jeopardy game. It is also intriguing to see the affect that one lesson has on a classroom's musical appreciation.

It has been interesting to see the high retention of knowledge from all of our students through lessons that involved multiple intelligences. For example, our students still search for ways to incorporate what they learned from the Rock N' Roll Jeopardy game into their work. When given a spelling homework assignment, in which they could

write about any musician or genre of music they liked best, all twenty-two of our students chose to talk about Rock N' Roll, which we predict would not have happened if the lesson was not as inspiring and thought provoking as it was.

Through vividly seeing and grasping the benefits of teaching through multiple intelligences in our classroom, we are preparing to continue with similar lessons throughout the rest of the school year. In the upcoming weeks, we have a flight simulation to Japan, the construction of a Japanese Teahouse, as well as the creation of a Japanese Restaurant planned. All of these lessons will help to engage student in Japanese culture through hands-on, motivating activities, which will include the following intelligences: math/logical, spatial, intrapersonal, interpersonal, bodily/kinesthetic, musical and verbal/linguistic. We are excited to see the development of our class, both academically, and behaviorally, with the completion of lessons such as these.

After sparking an interest of music in our entire class, we are planning a musical that our students will perform at the end of the school year for their parents. At the beginning of the year, nearly half of our student were not interested in putting together a play, or musical, but now, after incorporating lessons using music, and other multiple intelligences in our daily routine, all of our students are excited and engaged in the planning of the musical. Inspiring our students in the field of music has been a huge accomplishment for us, as a result of our inquiry project.

Even though our inquiry project helped us to discover 'answers' to our initial questions and wonderings, the ultimate question, *now what* fills our minds. Even more wonderings have begun to creep into our thoughts.

- Will our students' motivation, engagement time and critical thinking skills continue to increase throughout the rest of year, as a result of upcoming lessons?
- What will happen next year when we begin teaching a new group of students with different needs and strengths? Will we see the same results? Will we be able to spark the same intensity of musical/artistic thinking and abilities?
- Can multiple intelligences be incorporated into school districts that do not have the same philosophy of teaching as State College?

Our second question at the beginning of this project was about how the standards could still be met even with lessons that focused on multiple intelligences. We noticed through this inquiry that we were still providing students with the essential concepts that are part of the curriculum. The change we believe stemmed from making the lessons more creative by increasing student voice – both figuratively and physically. This also provided students with ownership into their learning and experiences in the classroom. One of the most important lessons we learned was that students can be led to not only heighten their current strengths, but to also strengthen their weaknesses. This also helps in developing a well-rounded individual. This study has also provided empirical evidence to support the use of inquiry in our classrooms as it provides opportunities to get a variety of learning styles and abilities to be included and successful in the classroom. Inquiry is essentially the process of asking thought-provoking questions, which do not have a simply answer. Through examination of teaching practices, student work, and lesson planning, great strides can be made in the field of education. The questions asked become motivating, moving ideas, which enhance the classroom environment.

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