Introduction

Somewhere around November I panicked. As I struggled to explain mitosis to a group of very low English level English Language Learners I realized that they had no idea what I was saying. Desperately I floundered to try a different approach. I drew a diagram on the board explaining the stages of mitosis. As I did so, the blank stares turned to giggles that quickly succumbed to full fledged laughter. As I stepped back to look at my drawing, I began to laugh to. Stage two of my mitosis diagram looked very little like a cell reproducing and quite a lot like a human buttocks mooning our classroom as if the teaching gods were sending their weekly message to all new teachers that this teaching gig is not going to be easy. While in retrospect this may sound humorous, at the time my aforementioned laughter had that slightly off tune sound to it, which, like a Jack Nicholson smile, reflects less amusement than encroaching insanity! As I left school that day, I was feeling exhausted, frustrated and unsure of what to do with the myriad "issues" (a euphemism that is better understood as pain-in-the-butt problems) that seemed to make up my 7th period NEP (Non-English Proficient) Life Science class.

Focus

As a rookie teacher researcher, I set out to identify the problem I wanted to explore. That's easy, I thought, the problem is the kids I'm paid to teach aren't learning what they're supposed to learn. I simply wasn't getting through to them. This essential problem was in turn serving as a foundation for countless other problems. Less and less students were paying attention. This of course led to some students finding other things to pay attention to, like another student's hair for example or the newest Pokemon magazine. I began to see kids not wanting, or even flatly refusing, to do work. Students were equally uninterested in working together. At one point, after putting the students in pairs, one student yelled out, "Ohh, Mr. Tracy, not him. He don't know nothing." I began to be concerned that cooperative learning would lead to a therapist's office down the road (for me and the alleged ignoramus). As I tried to slow my explanations down, I noticed looks of boredom from those with slightly more language skills and when I tried to move along, the lower level students floundered. I was also noticing that a few kids were taking over the class- questions were being answered by a few kids over and over again. What's worse, I noticed myself gravitating towards these kids because frankly it felt a whole lot better to get something back rather than that looks of utter confusion, or worse, utter indifference. Finally, (as if this list really had an end!) I noticed even with those students who seemed to be picking
up some things, it was only at the most superficial level of comprehension. This became painfully clear when “Cell Membrane” (a term for some reason they loved!) began be used as an answer for questions ranging from, “What do we call it when a cell makes copies of itself?” to, “Where is your homework?” I was in deep. I began to shape a research question.

Research Question

The initial question as well came easily. It had been floating in my head since the 1st of September. How could I effectively teach Science Content to low-level English Language Learners? (Or, in other words, “How the hell am I going to do this?”) I soon realized that this question like the previously listed problems was in danger of spreading rapidly into infinity. Thus, I began to look at three large overlapping themes in my class. First of all, how was I teaching the content I was supposed to be teaching. In other words, what pedagogical strategies was I using or not using to engage my kids. Secondly, I looked at the structure of my class. How was it organized? How was the structure supporting or not supporting my teaching? Finally, I looked at assessment in my class. How and when was I checking to see if they were picking up what I was laying down? Thanks to the guidance and advice of a teacher of a class I was taking, I started to merge the first two of these themes into the third. I began to ask myself what strategies of assessment could help me to convey content and what structures for assessment might provide an easier entrance into this previously befuddling world of Science content. These meanderings eventually led me to my research question. How, I asked, could structuring a class around a multitude of assessment strategies help lower level English Language Learners effectively access Science content? With this vague notion in my head, I set out like Quixote to take on the fearsome Giants of my classroom.

Context

Allow me for a moment to provide a bit more detailed context to the class on which I chose to focus and to the brave warrior at the helm of this sinking ship. (Excuse the mixing of metaphors! It aptly infers my own confusion as a young teacher!) I am a second year ESL teacher. My first year, I taught Language Arts and Social Studies to ESL students. This year, I have switched hats and become the Math and Science teacher for ESL students at Garnet-Patterson Middle School in NW Washington DC. I have very little formal teacher training. I entered teaching through Teach for America immediately after graduating from Colby College as an English major whose collegiate Science background consisted of a Geology course fondly referred to as “Rocks for Jocks.” (This unfortunately was slightly better than my Math background which consisted of a course know as “English Major Math.”) It is also worth mentioning, I spent my third year in college studying at the University of Salamanca in Spain. This not only provided me with my tendency to bizarre allusions to Quixote but also gave the Spanish skills I would often use as an ESL teacher. Towards the end of my first year, a woman by the name of Debbie Maatta approached me with an offer to begin a science program she had started
previously in other middle schools in the District in order to address the lack of content support being provided to English Language Learners. As our school was especially guilty of taking kids out of Science for “Language” classes, I saw it as a great opportunity. After a summer of preparation, in which I collaborated on a few occasions with other teachers and Debbie to develop the curriculum and took a course to help refresh my distant memories of high school biology, I introduced the Science program to two classes of upper level English language learners and one class of lower level English Language learners. The goal for all of these classes was to teach them the 7th grade Washington DC Life Science Standards.

The Students
The lower level language class consisted of 14 students. During the course of the year, one student moved to New York and three students arrived all after the Christmas vacation. Most of the students had not been in the country more than a year. Of the four students that had been in the country longer than a year, three of them had been declared eligible for special education (a topic for another research project!). While most of the students were from El Salvador and thus spoke Spanish, three of the students did not. One spoke Swahili (from Congo), another Amharic (from Ethiopia), and another English (from Guyana). The English speaker had been placed in this class due to the fact that the District gives an ESL test to all students coming from another country. Since this student could not read or write, he scored very low on his test and was thus required to take English as a Second Language courses. The class was made of predominantly 7th and 8th graders but due to scheduling constraints there were also three sixth graders and a fifth grader taking the class. Thus the ages in my class spanned from 10 years old to 15 years old. Based upon a diagnostic reading test given from the Qualitative Reading Inventory, the class on the average read in English at a pre-primer level. Several of the students were illiterate in their native languages. A couple of the students had never been to school in their native countries while over half the class had had significant interruptions in their schooling for reasons ranging from the need to work to schools closed down due to war. For a 24 year old, second year teacher in his first year of a new subject, at least some of those fearsome giants were more real than anything I had seen before.

Everyday Strategies I Used in My Classroom
Now that we have a better sense of the ‘who’ of this research, both the clientele as well as the man assigned to the job, let us return to the question of ‘what’ the research was to focus upon. While it should be clear why I chose this class, (it was causing me to lose my hair), why choose assessment? With the cornucopia of shortcomings littering my classroom, how could I be so sure that the problem was assessment? The truth is that I wasn’t. The purpose and process of Action/Teacher Research at the time was about as clear to me as mitosis was for my kids (so unclear I am still not sure of its name!). With all the bewildering variables that made up my classroom, how was I to make sense of
one particular area. In retrospect, my research could be compared, to use a peculiar metaphor, to a painting by another man verging on the edge of insanity, Jackson Pollack. I splattered various strategies and techniques based loosely around assessment on the canvas of my classroom with a vague notion of what I wanted to create. It was only after the form took shape and I could step back from it that I was able to construct some coherent meaning out of what I had made. Even then, the meaning was much less a scientific explanation than an emotional response. While what I feel I was able to create of course fell well short of the complex beauty of a Pollack, I like to imagine that in some ways it touches me just as deeply. Thus, while I will not pretend to have approached this research surgically with either a clear diagnosis or a prescient plan of attack, I will now attempt to provide a sense of the classroom strategies and actions splattered upon my students in an attempt to use assessment as a means of access to the content I aimed to teach.

As I began to look at the structure of my class, I thought about the order of events that occurred within a class period. I had been always taught to begin class with some kind of warm-up that would engage the kids and get them working as soon as they entered the classroom. While this indeed was an effective manner of transitioning from the chaos of the hallways to what I hoped to be a more orderly environment, two problems were emerging. First, students were spending far too long on their warm-ups and secondly, the transition from the warm-ups to the rest of the class was far from smooth. With the structure of assessment in mind, I began to change my warm-ups to check-ups. Instead of giving them something to think about what we were going to do this class, I began to give them quick check-ups on the last class period’s content. Often these took the form of visual assessments. I would ask the students, for example to draw a picture of cellular respiration or color code a drawing of a squid. These types of assessments served both to allow me to check to see if I needed to spend more time on a particular subject as well as impetus for the kids to review what they had learned so that they would be prepared for the quiz at the beginning of class. For each mini-quiz they could earn points toward their final grade. This strategy ran into a minor snag early on. While in theory it made sense, what happened was I wouldn’t correct the mini-quiz until that night. As a result, it was too late if they showed a lack of retention of the information. Thus in order to immediately assess how students had done on the check-up, I began to have the students exchange papers and correct them as a class. In so doing, both the students and I would know right away if we needed more review.

Early in the year I attended a Kagan workshop that provided me with the inspiration for my third strategy- eraser boards. As I mentioned previously, too often only a few students in my classroom were regularly answering questions. Thus, I put the class in pairs (often matching up relatively higher language level and lower level students) and gave each pair an eraser board, a dry erase marker, and an eraser. These boards were used to respond to questions I might ask during the course of the class. They could also be used to respond to multiple choice and true/false oral/visual assessment that I might use to quickly assess their understanding of an idea I had just covered. This technique led not
only to broader participation but encouraged cooperation as well since the marker would have to switch hands for each question. Thus, a higher-level student would have to explain an answer-even to the point of spelling it out- to a lower-level student. In addition, as the participation broadened, students became more apt to pay attention and be engaged. No one wanted to be the pair with the completely wrong answer. The boards infused a sense of competition within the class that led to greater access to the content for many of the students. (This sense of competition had its shortcomings as well, as students at times, would put down others for their wrong answers, however, after awhile these put downs subsided when the practice of using the boards became increasingly routine.)

A fourth technique I began to incorporate in my class was the use of multiple and varying assessment for a single content concept. For example, one of the lessons we came across early on in our unit on Ecosystems had to do with the Oxygen and Carbon Cycles. The invisible nature of these gases made it difficult for the students to grasp these concepts. Thus, in what I dubbed the sledgehammer approach (as in Whack! Did you get it? No? Whack! How about now?) I had the students doing everything from drawing diagrams of the cycles, to labeling parts of a drawing with oxygen or carbon-dioxide, to building a sealed ecosystem with a water bottle, water, sand, a snail, and a plant to show how things can stay alive, to taking several check-ups on various aspect of the cycles, to breathing in ten times while trying to say “Oxygen” and then breathe out with an airy “Carbon Dioxide!” and finally to taking a more traditional multiple choice and true/false test. In short, I assessed to death. Was all this necessary? For this class, absolutely. I do not say this flippantly or derogatively, but rather as recognition of the multitude of barriers that stood between these kids and the idea I wanted them to access. Repeated assessments that appealed to a variety of learning styles gave them multiple opportunities to overcome these barriers (whether they be of learning disabilities, lack of previous education etc. or most prominently, language).

A fifth technique that went alongside this multiple and repeated assessment technique was the implementation of Science Notebooks in my class. Somewhere within the dark days of November, I gave each of my students a small one-subject notebook. In these notebooks, which, by the way, never left the classroom, students kept all their notes for this class. In addition, when introducing a new subject I would often ask them to respond to a question on their eraser boards and then upon revealing the correct answer, I would have them write/draw it in their notebooks. This served as another tool of repetition as well as engagement. In addition, the Science Notebooks served as a way for me to assess my own teaching. Looking back through various students’ notebooks would immediately show if they were following what I was saying and if I was being clear about what they were to write in the notebook. I soon realized that I needed to give more time for copying and be more clear about organization (for example, explaining to the kids to write the date and leave space each time they started a new class period). Finally, just as I began the class with a quick check-up assessment, I always ended class with a quick check-up assessment. As the kids left class, I would stand at the door and ask each kid a brief question on
what we learned in class. For example, I might ask a kid after a class spent dissecting a squid and discussing the purposes for various body parts to name three parts on the squid used for dissection. If they do not get it, they go to the back of the line where more often than not they would either ask another student or search their notebooks for an answer. While obviously not the most scientific of assessments, this strategy gave me a chance to get a sense of where we were as a class and which students were struggling. Often, these out the door assessments would lead to me taking a kid aside and explaining something he/she did not understand.

Broad Assessment Strategies Used

While these were the primary everyday strategies implemented during the course of the year in my quest for a class structured around assessment, I also used two other more broad assessment strategies that were less my idea and more District policy. The first was Portfolio assessments. At the beginning of the year, I assessed the kids in their reading, writing, spelling, vocabulary, math and science content. The science content test was given in English and Spanish due to the fact we were more interested in content than language. In addition, I assessed the student’s ability to comprehend passages about Science content as well as their ability to write sentences about Science Content. These assessments were repeated in June in order to chart the progress. In addition, for each Essential Skill (taken from the 7th grade Life Science Standards) that we covered I would place a piece of the students’ work that demonstrated an understanding of that Essential Skill. At the end of each unit, I would give the students a worksheet that listed all of the skills they were supposed to be able to do by the end of the unit. They would then rummage through their portfolios as well as their science notebooks in an attempt to find “proof” that they learned a particular skill. In addition, at the end of the year, I sat down with the women at the head of the program and we tallied how many of the students had shown an understanding of a particular essential skill. Obviously, just what an “understanding” looks like is up for considerable debate but in the interest of time, and when seen within the larger framework of the assessment structure of my classroom, we pretty much accepted all forms of evidence that showed a student had worked with the skill. These portfolios were also graded using a rubric provided by the District in September, January and June in the areas of reading, writing, speaking/listening, math (for lower level language kids only) and technology. The 1-5 scale rubric was used in independent grading by myself and the other ESL teacher at Garnet-Patterson. This assessment allowed us to focus more on language improvement rather than on content. Finally, the last form of assessment that I used was the LAS (Language Acquisition Scale), administered annually to all ESL students in the District and to a much lesser extent the Stanford-9, which due to rules about the SAT-9 and ESL students, only half of the class I am concentrating on here actually took. While obviously it was not my strategy to use these as assessment tools, the LAS especially helped on the language side of my assessment to chart progress from this year to last.
However, its immediate effect on my classroom will probably be felt more next year than this.

**Data Collection**

Now that we have an outline of the many strategies I used during the course of this year in hopes of structuring my class around assessment, let us take a moment to look into how I went about gathering the data that would tell me how effective or ineffective these strategies were. In other words, just as my kids rummaged through their portfolios for evidence of their success where did I rummage for evidence of mine? The first source of data I used was surveys. Over the course of two days, I asked the kids to complete an extensive survey addressing a variety of issues. In administering the survey, we went through it as a group. I read each question first in English and then in Spanish. I also paired the lowest level students with someone who could provide language support. The survey was mostly multiple-choice with blanks for those who could explain why they chose certain answers. In these blanks students were permitted to answer in English or Spanish. Secondly, I did one-on-one interviews with three students. One student was an Amharic speaker who had been in the US for over a year and a half during which time, he had picked up quite a bit of English. He had come to the class with probably the best educational background. Secondly, I interviewed a girl who had been in the country for about the same amount of time but was a Spanish speaker. Finally, I interviewed another Spanish speaking girl who had been in the country nearly three years and who had recently been declared eligible for Special Education. Next, I used my principal’s observations of my classroom in the fall and in the spring. I also used the test scores from the LAS as well as, perhaps most importantly, from the Science pre and post-test. The portfolios themselves also served as an effective source of data. Finally, I would jot down observations during class on yellow Post-it notes and later used some of those to write journal entries. This was not done as religiously as I wished so therefore they were not as helpful as some of the other sources. Nevertheless, since I was better about it early on in the year, these reflections serve as helpful historical records of where I started, if not where I arrived.

Like my strategies, this process of data collection was not done with nearly the forward-looking intelligence I would have liked. Succinctly put, I wasn’t always sure where I was going so I didn’t always know what to take. In turn, this led to me packing a little bit like my girlfriend- throwing everything possible in the bag at the last minute. As a result, much of the data I dragged along was not useful for the purposes of this research and there are some gaps I would have like to have filled long ago. Nevertheless, unlike my girlfriend I can’t use these gaps as an excuse to do more shopping so I’ll have to make do with what I have! In sorting through my data, I tried to find things that stood out as supporting strategies as successful without ignoring the many pieces of data that suggested that much more work needed to be done. In the interest of time and sanity, I concentrate for the purposes of this paper on three sources of data: the pre and post tests, the surveys (Appendix A) and the one-one-one interviews (Appendix B).
Findings

I will start my data analysis with the piece I saw as in many ways the least subjective of the data and perhaps, thus, the most telling. If my strategies were trying to improve the effectiveness as a teacher, what better source of data than looking at how well the students did on their end of year tests. In so doing, I threw out the results of students who had not been with me the entire year. This eliminated two of three of the students who transferred into our school from other countries as well as one student who transferred into my class after the first semester due to a scheduling change. The average improvement from the pre-test in September to the post-test in June was 34 percentage points. The scores ranged from 17 percentage point growth to 76 percentage point growth but even when those scores are eliminated the average improvement remains at 30 percentage point growth- a clear indication of, if not significant, substantial growth. Another source of testing data I found significant in answering the extent of these strategies success was the science reading and writing tests that were administered in September and June. The average percentage point growth was 13 in reading and 17 in writing. These scores were less substantial than the content scores but still show a respectable amount of average growth.

Less mathematical but equally telling were the results of the surveys and the one-on-one interviews. When I asked the students whether they now had more, less, or the same interest in science as they did at the beginning of the year, eleven out of thirteen students said they now have more interest in Science. These responses were validated by my own observations. I noticed that more and more kids were staying after class to ask me questions or to tell me about something they saw on TV that related to what we were doing in class. After we started a unit on fish, one student came to my room nearly every day for lunch to take care of my fish tank and to tell me about his fish at home. (Yes, while I was thrilled to see interest, the 34th conversation about what his little brother did to his fish did begin to wear on me!) Since I did not see this type of interest previously, I attribute a great deal of it to the structure of assessment I implemented in my class. My principal, as well, commented in her end of the year observation on how engaged my students seemed to be. In my one-on-one interviews as well, student comments reflected a growing sense of interest in Science. One student said to me, “I like Science now because it let me know how plants grow and how a person lives.” In the survey, as well, I asked the kids to rank their classes from the class they understood the most in to the class they understood the least in and then to rank their classes from the class they’ve learned the most in to the class they’ve learned the least in. In both cases, twelve out of fourteen either chose our Science class as their first or second choice. When taken in context of the other evidence, I believe this reflects a greater sense of access to the material through multiple, repeated and varied assessment. One student succinctly made the connection between engagement and comprehension when she said to me in the course of our one-on-one interview, “This is my favorite class because I understand the most.” In addition,
I think it speaks of the need to spread this notion to other classes in our school, both ESL classes and non-ESL classes, in the years to come in order to improve our school-wide service for English Language Learners. (I will speak more to this point later in the paper.)

When I asked the students what type of assessment they liked the most, and gave them 4 choices (picture explanations, short answers, true/false, multiple choice) to rank from favorite to least favorite the winner was picture explanation. However, what struck me as most significant for the purposes of this paper was how varied the responses were. The variety of rankings suggested to me that each student had their own preferences and supported the notion of giving multiple kinds of assessment for one content idea. In so doing, I was able to appeal to variety of preferences illustrated in this survey question. The final question of significance occurred when I asked the students whether or not they enjoyed using the eraser boards, all of them said yes- a clear indication that these eraser boards were a tool for student engagement.

**Reflections**

Finally, while perhaps the least reliable from a research point of view but nevertheless worth mentioning, is that I became increasingly less insane as the year went on! I didn’t think it was appropriate to use comments from my girlfriend in this research paper about how much more pleasant I was to be around later on in the year, but I must say that the structures of assessment I implemented caused the class to run so much smoother that I wasn’t nearly as worn down on a regular basis as I was early on in the year. Of course, these structures of assessment were used alongside various classroom management techniques that helped as well but I became more convinced that what I needed for this class was not to be more and more strict but to become more and more engaging within a clear structure of assessment. I should also briefly mention that the paired groups using eraser boards helped to lessen the resistance of working together. In fact towards the end of May while I was putting the kids in pairs, an Ethiopian student in my class yelled out in reference to the Congolese student (who previously according to him, “[Didn’t] know nothing”), “He should work with me!” I almost fell over. While my classroom was by no means a model for cooperative learning, I will say progress was made and I attribute much of it to this structure of assessment that fostered an environment of increased confidence and thus, cooperation.

In looking over all this data, there are two very broad lessons that I have learned. First of all, I have learned that teacher research can be a particularly difficult task for young teachers. This is not to say it is not to say that the struggle is not beneficial, in fact I believe quite the contrary. However, as I have illustrated early on in this paper, and I do not believe I am alone among new teachers in this regard, the classrooms of new teachers are filled with problems. This in turn leads to choosing a research topic that is either too broad in hopes of stamping out the multitude of problems or choosing a narrow topic that is so infiltrated by variables (i.e. other problems) that sorting through the results proves
Herculean. In my case, I believe that that the former case describes my situation best. Unfortunately, it wasn’t until I went to the research that I realized this.

This leads to my second lesson- don’t go spending 6 months doing research and then look and realize that many much smarter people have written articles on something on which you spent three sentences! For example studies upon studies have been done on Portfolios alone. Alternative assessment articles could clog an Andersen shredder. My Internet search for “Assessment for ESL” took about an hour and a half due to how much information was out there. Thus, I feel a little like a guy named Jesús in Los Angeles who thought he was the savior until he found out there were 178 Jesúses in the greater Los Angeles area.

Nevertheless, the research does seem to support my own research in a few key areas. Of particular relevance, I found a study done by August and Pease-Alvarez done in 1996 on attributes of effective instruction for language minority students. In the study they list five notions that should be remembered in creating effective assessment for ESL students. Assessments of ESL students they say should be varied and conducted in a “variety of contexts obtained from a variety of sources through a variety of procedures.” I find this particularly important in the way it stresses the importance of having students learn things in different contexts. One of the things I hope to do next year, is to provide students with more varied contexts outside of the classroom in order that they may see a larger relevance to the material we are learning in the class. Of interest as well was another study conducted by the Intercultural Development Research Association (IDRA), reported on by Robeldo and Danini in 2002 in which they identified ten “promising and/or exemplary bilingual education programs as determined by participating limited English proficient (LEP) students’ academic success” and tried to find what they had in common.

In the sub-section about staff accountability and student assessment, the authors write that, “the school uses appropriate multiple assessment measures to describe all students, including LEP students.” I think this is a critical notion to raise in my own consideration of further implications for the work I have done this year. Due to the fact that our ESL population is relatively small (about 17%), and any one mainstream classroom may only have two or three ESL students in it, mainstream teachers may be reluctant to incorporate multiple assessment measures in their classrooms. What this study is saying, however, is what’s good for ESL students is good for all students. In addition, the study says that “[r]igorous academic standards are applied to all students including LEP students.” This, of course is a source of much contention among teachers that I do not hope or want to argue here. However, I think if we maintain this as our goal and use multiple assessments along the way, we will have a much better chance of moving our ESL students towards this goal. As the study itself says, assessment in schools that serve ESL students the best is, “ongoing and used for diagnostic purposes.” This speaks to one the many lessons I have learned from this project- that assessment can become an important form of conversation with my students- a chance for me to tell them what they should know and a chance for them to tell me if they hear me. This conversation can take many
forms. As a diagnostic tool it is an icebreaker feeling out where we are. As a tool for differentiation it allows me to carry on distinct but still meaningful tasks with a variety of students at once. As a tool for demonstrating the relevance/importance of the material we are learning, it’s a life-lesson conversation. In short, assessment, I have come to realize, is not just a conversation in which my only line is “A, B, C, D or F.” As I begin to consider implications for next year, I think this could be of particular relevance to many of our teachers who service English Language Learners. As Jo-Ellen Tannenbaum from the Montgomery County Schools writes in her article entitled, “Practical Ideas on Alternative Assessment for ESL Students,” alternative assessment differ from traditional assessment in that the, “focus is on documenting individual student growth over time, rather than comparing students with one another.” Instead of waiting for the SAT-9 results to come back on the last day of school, we should be using more varied and applicable means of assessment throughout the school year.

Final Thoughts
What does my data along with the research teach me? First and foremost, I have learned one of the many seemingly simple lessons that ones tends to stumble upon in their first few years of teaching- namely that when students have access to the content, in this case through varied assessments, and they feel like they are learning, they will be more engaged, better behaved and in the end their achievement results will improve. Am I completely satisfied with the achievement of this class? Not by a long shot. As anyone who has been in a classroom knows, results can’t be measured by averages. Each student must be considered individually. As I look to next year, I hope to modify my assessments in order to speak to the strengths and weaknesses of each student. In fancy educational language, I hope to begin to differentiate assessment. In so doing, I hope to boost the achievement of some students who for various reasons did not progress this year as I would have like.

Secondly, in looking back over my data and looking forward to the year to come, I have noticed that too often my assessments left little room for critical thinking. More often than not, they were illustrating a basic understanding of the concept or simply a basic understanding of what they were asked to do. To address this problem next year, I hope to focus on more genuine assessments in which students are forced to bring together multiple concepts in a more synthesizing fashion. This would also address another issue in my class, retention of information. Too often kids would demonstrate an understanding in one assessment and then months or weeks or days (hours and even minutes to be truthful!) later seemed to have lost the information. I hope next year to provide more opportunities for “real-world” kinds of assessments. One of my biggest regrets from this year is that we didn’t go out on many field trips that would allow that them to put into practice what we had learned in the classroom. In formulating the curriculum for next year, I want to try to give the kids as many opportunities to not just see pictures of concepts but to both see the real content
(or at least the context for the content) and see how science is being applied and can be applied to the world around them.

In a still broader sense, however, outside the question of assessment, I strongly believe that the implications of my research on me as a teacher and hopefully by sharing this research with other teachers at my school, implications of my research on my school have/will be significant. Action research has led me to some important realizations about the students I teach. I am slowly learning to look below the surface when it comes to my students. More and more I find myself not asking “What is wrong with me or what is wrong with so and so” but “What am I doing that what I’m saying isn’t getting through and what is so and so feeling to make him act/react in that way.” More succinctly put, my questions are more intelligent. While far from scientific due to the vast complexity a classroom, I am able to look at things in a more analytical manner. To be frank, the most important reverberations of this research for me lie here- in the reassessment of myself as not someone who simply reacts emotionally and spontaneously to situations, but rather someone who considers a situation and attempts to see through to its causes.

With the daily demands of teaching and the vast array of needs my students bring to the table, this is far easier said then done. I am light years away from effectively incorporating this philosophy into my teaching. Nevertheless, it is a destination towards which to aim. Without the willingness to look for the causes of problems in the classroom and some understanding of the individual causes for various behaviors finding solutions is like throwing darts with a blindfold.

In closing, I remember last year, my first as a teacher, a very small, young man (I’ll call him D) who was as cute as he was restless and stubborn, stayed after school with a friend of his. They started talking about how they first came to this country and D explained to me that he had walked and hitchhiked his way to the Rio Grande and then swam across with armed border patrol officers nearby. Looking back, I see now that as D spoke I was getting a first class lesson in the importance of knowing the children you see everyday. There are reasons for student’s actions. As teacher’s we must be willing to search for them. Onward Quixote!
References
Appendix A

Name: __________________________
Date: __________________________

Survey for ESL Science:

1) When do you understand stuff in this class the most? When Mr. Tracy: (Rank from best to worst)
   a. Draws or shows you pictures to explain something ______
   b. Explains something to you by speaking in English ______
   c. Explains something to you by speaking in Spanish ______
   d. Gives you something to read that explains something ______
   e. Uses you to explain something by acting things out ______

2) Which kind of quiz do you prefer? Rank from best to worst
   a. Multiple Choice: ______
   b. True/False ______
   c. Short Answer ______
   d. Picture explanation ______

3) Do you understand what is going on in this class:
   a. All of the time
   b. Most of the time
   c. Some of the time
   d. Almost never

4) When you don’t understand something in this class, (Rank them from first to last)
   a. Ask another student ______
   b. Ask Mr. Tracy ______
   c. Try to figure it out on your own ______
   d. Ask someone at home ______

5) Do you prefer working in: (Rank them from best to worst)
   a. Alone ______
   b. In pairs (2 people) ______
   c. In groups with your friends (3- 4 people) ______
d. In groups that Mr. Tracy chooses ______

5a) Why?
______________________________________________________________
______________________________________________________________

6) Do you think this class is:
   a. Very easy
   b. Somewhat easy
   c. In the middle
   d. Somewhat hard
   e. Very hard

6a) Why?
______________________________________________________________
______________________________________________________________

7) Do you like using the eraser boards? Yes / No

7a) Why or why not?
______________________________________________________________
______________________________________________________________

8) Did you study science before this class in any other school? Yes / No

9) If so, for how many years?
______________________________________________________________

10) List your classes from the class you understand the most in to the class you understand the least in:

    1. __________________________
    2. __________________________
    3. __________________________
    4. __________________________
    5. __________________________
    6. __________________________

10a) Explain why do you think you understand the most in #1?
______________________________________________________________
______________________________________________________________

11) List your classes from the class you have learned the most in to the class you have learned the least in:
11a) Explain why do you think you have learned the most in #1?
________________________________________________________________________
________________________________________________________________________

12) List your classes from the class you have liked the most in to the class you have liked the least:

1. __________________________________________
2. __________________________________________
3. __________________________________________
4. __________________________________________
5. __________________________________________
6. __________________________________________

12a) Explain why do you think you like #1 the most?
________________________________________________________________________
________________________________________________________________________

13) What do you like about this class?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

14) What do you not like about this class?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

15) What do you like about how Mr. Tracy teaches?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

16) What do you not like about the way Mr. Tracy teaches?
________________________________________________________________________
17) Why do you think we study science?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

18) Name as many jobs as you can that might use science:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

19) Do you work with other students in this class, 
   a. More than in other classes
   b. The same as in other classes
   c. Less than in other classes

20) Do other students in this class help you to understand things you don’t 
    get: 
    a. A lot
    b. Sometimes
    c. A little
    d. Almost never

21) Give an example of a time when another student helped you?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

22) Do you help other students: 
   a. A lot
   b. Sometimes
   c. A little
   d. Almost never

22a) Why/ Why not?

________________________________________________________________________
________________________________________________________________________

23) Give an example of a time when you helped another student: 

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
24) Do you feel you’ve learned more in ESL Science than you would have in your regular Science class? Yes / No

25) Why or why not?

Appendix B

Summary of the One-On-One Interview Questions:

1) Did you like this class this year? Why or why not?
   - E: Yes- I learn a lot
   - W: Yes- because we do projects
   - A: yes- cause we dissect squid

2) What was your favorite class you took this year? Why was it your favorite?
   - E: I like Science because it let me know how plants grow and how a person lives
   - W: Art because we draw and paint and because I like Ms. C
   - A: This is my favorite class becaue I understand the most

3) What was your least favorite class? Why was it your least favorite class?
   - E: Ms. _____. Its too boring.
   - W: Math because it’s hard.
   - A: I don’t know

4) What was your favorite part of this class this year?
   - E: The project when we draw the (arrows) {Cycles Project}
   - W: I like making the books {Pointed to the Plant Organ books}
   - A: I like the Squid

5) What did you not like about this class this year?
   - E: Nothing
   - W: You give too much work
   - A: I don’t like the homework

6) Which kind of quiz did you like the best? (I showed them examples of the three kinds)
   - E: Short answer
   - W: True/False
   - A: Picture Explanations

7) When did you understand the most in this class? Gave them three choices: When I explained things: (E: No, W: Little, A: Sometimes), When

8) Do you want to learn more about Science next year? If so what?
   - E: Yes. About plants.
   - W: Yes: I don’t know
   - A: Yes: how the body work