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Introduction

The teachers of the 2008 Advanced Methods of Teaching Science class represent an energetic, dedicated, and talented group of educators. Their enthusiasm for teaching has made this semester a truly enjoyable experience for me. I am sure that they will positively influence many students for years to come, instilling in their students a love for learning.

This year's class includes Ryan Bolland (Eight Grade Science, Chastain Middle School, Jackson), Courtney Dauwalter (Biology I, Chemistry I, and Physical Science, Potts Camp High School), Jacob Deitz (Microbiology, Environmental Science, and Anatomy and Physiology, Simmons High School, Leland), Christina Jordan (Biology I, Environmental Science, and Astronomy, Provine High School, Jackson), Jason Kopanke (Biology I, Lanier High School, Jackson), Sean McClish (Chemistry I, Chemistry II, and Physical Science, Byhalia High School), Sara Rowley (Eighth Grade Science, Solomon Middle School, Greenville), Mike Warner (Algebra II and Biology II, Holly Springs High School), and Liz Zbrozek (Chemistry I, Chemistry II, and Physical Science, North Panola High School).

I compliment each of these young teachers for choosing to make the education of young people their career and wish them success in their every endeavor.

Johnny L. Mattox, Ph. D.

An informal assessment of the ability of middle school students to follow written directions

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December 6, 2008

ABSTRACT

Many teachers observe that students often fail to follow directions. To quantify this observation, one hundred and four middle school science students were given written a quiz with written directions asking them to complete a simple task before beginning the assignment. Ten of the students observed followed the written directions, confirming the belief that modern students fail to follow directions.

INTRODUCTION

Becoming a teacher has caused me to enter into a great deal of reflection about my behavior as a student, particularly in settings that relate most closely to those in which I find myself teaching. My experience as a student, however, does not include being in a public school in a critical needs district in a high poverty area while in eighth grade. My closest experiences are my eighth grade in a very small, private, Episcopalian elementary and junior high school and my time in a large public high school. Drawing from both of these settings, I try to assemble a sort of composite recollection and projection of what I would be like as a student in one of my own classes. Which of my students am I most like? Would I really act that way? Would I say those things? Did I have the same abilities and difficulties?

It is, of course, difficult, if not impossible, to make an accurate estimation of how I would be in this hypothetical scenario. However, I can't help but believe that I was a better listener than my students when I was an eighth grader and would be a better listener if my eighth grade self were to be inserted into my own classroom. As a teacher and coach, one of my greatest frustrations is with my students' inability or unwillingness to listen to, read, and follow directions.

In my first few months as a teacher, I have said and heard others say that the children we teach "just don't listen" or similar statements of frustration. I know I have seen them write on class sets of things that they have been told no less than ten times not to write on. Also, they often ask questions that could be answered if they simply read the directions written at the top of a page. Anecdotes and observation support the commonly held belief. However, in this study, my purpose is to objectively quantify my students' inability to follow written directions. The hypothesis was that less than half of the students would follow the written directions as instructed.

MATERIALS AND METHODS

One hundred and four eighth grade science students were administered a short open note quiz on weather fronts and weather maps in alignment with the Mississippi state eighth grade science standards, objective 5.b. The quiz was passed out while verbal directions were given. Students were told to use another sheet of paper to record their answers to the quiz. They were instructed to write the letter of the correct answer on their own paper. Students were told to not write on the quiz sheet itself, but only on their own paper. The written directions for the quiz were as follows:

> Do NOT write on this sheet. Write the letter of the correct answer on your OWN sheet of paper. If you read these directions, silently write "CMS" at the very BOTTOM of your paper and begin your quiz. Good Luck!

Verbal instructions did not mention anything about writing "CMS" on one's paper.

The teacher collected the quiz answer sheets and counted how many students wrote CMS anywhere on their paper below the space in which students wrote their answers. Data from each block was compiled and analyzed as a group. A separate analysis was again run on the data for the lone accelerated science class to see if this group had a higher rate of obedience.

RESULTS

In the complete sample of one hundred and four students, ten (9.6%) followed directions as written and wrote "CMS" at the bottom of their paper. In the accelerated class, one out of eleven (9.1%) followed the written directions.

DISCUSSION

The results of this study show that students, on the whole, do not follow written directions. The vast majority of the students failed to follow the directions as written clearly on the top of the assignment. Furthermore, the assignment was administered as a quiz, often perceived to be a more important assignment that is taken more seriously by students than an ordinary worksheet may be. Furthermore, while the quiz was administered there were no major classroom disruptions that might explain an inability for the students to follow directions on this particular task.

In looking at the data from just the accelerated class, there is an insignificant difference in the percentage of students who followed the written directions. One would expect that students in an accelerated class would be more thorough in their work and, thus, more likely to read directions before beginning an assignment. However, the results of this study clearly suggest otherwise.

These results are troubling. While the hypothesis was confirmed, it does not make the results any more pleasant. Seeing that an overwhelming majority of students did not follow the directions to a quiz as written demonstrates the challenges that many teachers face and can go a long way in explaining poor performance in many cases. An inability to follow written directions in a quiet, captive environment does not suggest that many students would often follow verbal directions, although this capacity was not addressed in this study. It is possible that students' struggles with literacy affect the results of this study. Less confident readers may skip directions, having received what they perceive to be adequate direction verbally.

A study that addresses students' ability to follow verbal directions would be a good follow up and companion to this study. A teacher could give verbal directions without accompanying written directions and evaluate the outcome. Conversely, a follow up study could omit verbal directions altogether to see if, without a verbal alternative, students would read written directions to be sure they are completing the assignment correctly.

Seven Tips for Survival:
A first-year teacher's reflection on teaching tips that seem to work...

Courtney Dauwalter
6 December 2008

Reflecting on a first semester of teaching can be overwhelming. Reflecting on a first semester of teaching in a high-needs school district is mind-numbing.
Did I survive? It seems I did.
Did I have any successes? You could say so.
Did I have hard days? Naturally.
Do I enjoy teaching? I do. Really, I do.

As a first year teacher in a high-needs school district, I knew it was going to be a challenge. It would have been foolish to think any other way. I also knew that no matter how many veteran teachers I grilled with questions and "What if..." scenarios, that it would be impossible to know everything and be prepared for everything I was about to encounter in this profession, in this location, in this socioeconomic class.

There are some words of wisdom I received before starting the school year that I could not have been more greatful for. There are some things, however, that I had to find out on my own, through my own failures and successes.

This is a compilation of wisdom that was passed on to me and wisdom that I have acquired through tragic failures, or massive successes, that I hope will help new teachers in the future, new science teachers reach success and new science teachers in high-needs school districts to have as much preparation as possible for this *life*. Because it is not a job. It is a life.

1. Eyes wide, ears open!

There is a lot to learn. No matter how much subject knowledge you may have. No matter how smart you are. There is a lot to learn. Get as much advice from veteran teachers as possible, research the area you will be living in, working in and playing in in order to prepare yourself for the culture shock that will ensue upon arrival to your destination. Pretend you have landed on a new, unexplored island. Do not bring preconceived notions; do not bring judgement; DO bring flexibility, willingness to learn and openness to all things different.

2. Use the lab! Or whatever small, understocked area that is called a "lab" in your building.

The kids are not used to doing labs. They have had many teachers who don't know the subject themselves and thus steer clear of the laboratory for fear of burning the building down, many teachers who don't trust the kids with the lab equipment or with the freedom of moving around in a laboratory area without fighting eachother, and many teachers that don't care enough to put in the effort required to prep for a laboratory activity.

Labs are a lot of work. The prep work, the pre-lab, the monitoring of lab activities, the clean-up, and the discussion that needs to take place after every lab... it's all enough to create major chaos and major migraine for any sane person. However, giving the students a chance to be in the laboratory area will give them the feeling that you trust them, that you are ready to give them a shot at doing some active learning and that they have been given a priviledge that can very easily be taken away. The learning will be enhanced. The rating of your class in their eyes will increase (making them less likely to cause problems and more likely to actively participate).

The energy required by the teacher for a laboratory activity does not decrease over time. The students will always be students, who will always be curious what happens when fire meets hair, sweatshirt or notebook. However, the energy put into the lesson by the teacher is very much rewarded when the students genuinely see meaning in the subject and in learning.

3. Scratch their backs!

Your administration can be your worst enemy, or your best friend. The custodial staff can make or break your day. The maintenance man can save you from a seemingly sinking ship. Get to know them all, scratch their backs once and awhile, and get them on your side. Later, when your back needs a little scratch, you will have plenty of people to go to that might be willing to do some scratching for you...

4. You cannot force-feed success or the desire to be successful.

Some students simply do not care. As much as you might try, as many freebie points as you may give them, as much tutoring hours, study guides or review sheets as you offer, some students will not care. Handing the students points on a silver platter, spoon feeding them information occassionally, or giving them review sheets that are almost identical to the test will not catch on for many of them. They will care, or they will not care. You can only do your best to sway them towards the CARE side.

5. Word Walls are not just for English teachers.

Initially, I thought Word Walls were only the friend of an English teacher. However, they can be extremely useful for a science teacher as well. It is hard to keep all the vocabulary straight for the students. The words used in science are not always easy to pronounce, easy to spell or easy to remember. Oftentimes they sound similar or look similar when written (i.e. mitosis and meiosis, genotype and phenotype, etc). Having a word wall in my room not only makes it easier for the students to visualize all the words they are in charge of knowing for that particular unit, but also opens up lots of options as a teacher for activities. Different activities using the word wall that I have found effective: randomly calling on a student to pick a word from the word wall and define it, having students make notecards for all words on the Word Wall, matching games between definitions and words on the word wall, having students create sentences using the words on the Word Wall, and having students write stories that incorporate words from the Word Wall. All of these activities can be used spontaneously throughout a lesson. All of these activities can be used to help fill those last minutes of class before the bell rings. All of these activities enhance the students' understanding of the unit vocabulary, increasing the odds of them succeeding on upcoming tests or subject area state tests in the spring.

6. Science Fairs are NOT one-man productions.

Bottom line: The organization, preparation, set-up, coordinating, traffic-controlling, clean-up, tallying of scores and grading of projects is NOT a one-man production. This is a huge undertaking and it is impossible to complete alone. Especially as a first-year teacher.

This was a lesson I had to learn the hard way: trial and error, experience and failure, completion and physical exhaustion. The science fair got organized, the preparation went as planned, and the set-up was flawless. The judges showed up, the students, predominately, behaved themselves, and the cleanup went as well as expected. The tallying of scores and the grading of projects is the cherry on top of it all. The cherry is the worst part of a sundae. The tallying of judge's scores and the grading of student projects was a migraine and made me physically ill. My advice: get help from anyone or anything! If it can add, if it can organize, and if it can staple, hire it on as assistance to these last necessary steps of all science fair productions.

Trying to match up judge score cards with other judge score cards with student names with posters was a nightmare. Averaging the judges' scores to get an overall ranking for each student project was time-consuming and headache-inducing. Grading each students' projects with a separate grading rubric from the judges was another undertaking that made the task seem endless, bottomless, hopeless, and incredibly irritating.

I would not be so bitter about science fairs if I had not tried to single-handedly complete

EVERY aspect of the PRODUCTION. Broadway shows are not run by a single person. Movies are not made by a single person. Science fairs should not be conducted by a single person. Reiterate this to your principal if they assign you this prestigious task. Reiterate it until they understand that you will not function for the entire week after the science fair is over unless they provide you with some assistance.

7. Candy is your best friend, and your worst enemy!

Students love it. Students will work very hard if they think it may be possible to earn some. Students become hyper when they consume it.

Teachers love it. Teachers will work very hard to not consume it so that they always have some available for their students. Teachers will become stressed and consume more than they should.

Choose to use candy as an incentive if you agree with baiting, or bribing, your students to complete their work. Award students randomly for following classroom procedures, working hard on classwork, or being extremely helpful to you or another student.

Choose to give out candy that you do not like to eat, as a teacher, so that stressful situations do not lead to obesity.

I cannot guarentee that these seven tips will make teaching science in a high-needs school district any easier for you, as a first-year teacher. I cannot guarentee that the experiences at one school will even closely resemble those at another school. I can only offer what I know to be true SO FAR. These are the words of wisdom I have learned over the past semester to be the most helpful, or to be the most desireable (i.e. I would have loved to know some of them before stepping a foot into my classroom in August).

My goal for this article is to put in writing the tips that have been the MOST useful for me as a first-year teacher, teaching a state-tested subject, in a high-needs area.
Am I excited to keep learning the tricks of this trade? Absolutely!
Will my words of wisdom change over time? Probably.
Will I share those words of wisdom with you as they change? Most definitely.

What is it that leads us where we go? Is it the wind that blows us at random, are we no more than a fallen leaf drifting where the wind wills? Is it love that draws us forward, leading us onward. Should we flip a coin and let the fates decide. Or does a great conductor steer us onward where he wishes. Does it even matter which road we choose?

Many roads have I traveled from the saddle of my bicycle or by the power of my two feet. From the shores of the Columbia river to the banks of the mighty Missipp. From the lush evergreen forests of Washington to the shrub lands of southern California. What have I seen? I have ridden beautiful roads in every state I have been in, I have found quiet trails touched by God's magnificence. It is not the trail that matters, but how you travel it.

Whatever trail we happen to be on what do we do? Merely pass through neither leaving nor taking anything. Do we tear up the trails and throw our garbage on the side of the road. Do we take but give nothing in return? Or will you leave the place better than when you came, picking up trash and maintaining trails.

What about our everyday life, how do we travel? Will you do something to change the lives of those around you, to leave the trail better than you left it. Each individual has something to contribute, we all have gifts so we all bring something to contribute. It is our responsibility to make the choice to contribute or not. Not every road is the same, some have washed out and it might be easier to turn around and go back from whence we came. But if we take the time to repair the road and continue on the rewards will be great. Not only for ourselves but also for those who use the road every day. Often we are just passing through, but this doesn't mean that we cannot help. Life is short and we must make a decision. No matter where we are, what road we are on, we should take each day and do all we can to leave the roads we are on better than before we came. And what better place to do this than the classroom and athletic fields. To be a role model for the youth of our nation. To teach them something valuable for their lives. More importantly to provide these youth with the tools to then turn around and give back to their own communities. You can give a man a loaf of bread and he will be content for the day, but if you teach a man to grow wheat he will never go hungry. The same goes for us as teachers, many of us will not spend our whole careers at the schools we are in now. But this doesn't mean that we cannot do anything. Take one student and teach him to lead the rest, make this student your project. Give them everything you have, your experiences, your knowledge and wisdom. If we can do this there will come a day when we can look back on our lives and feel content that we have made something of our lives, we have been more than just a passing shadow. Life is short, and one person can only do so much, but do something.

Name Variation Between Mississippi Schools

Jason Kopanke
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Abstract:

The selection that people use in choosing the name given to their offspring must have selective pressures from some facet. Students from two teachers in different communities were examined in this study. The first school, Lanier High School, is located in the urban centre of Jackson, Mississippi. The second was from a more rural community, Holly Spring High School, Holly Springs. The percentage of students with the first letter of their names starting with the letter "J" was compared between these communities. Using this criterion, Jackson was found to have a higher proportion of students whose name starts with the letter "J." This signifies a lower diversity in name selection. This paper questions whether the education level of the community affects name selection. Education was found to be higher in the city with the more diverse letter choice for names.

Introduction:

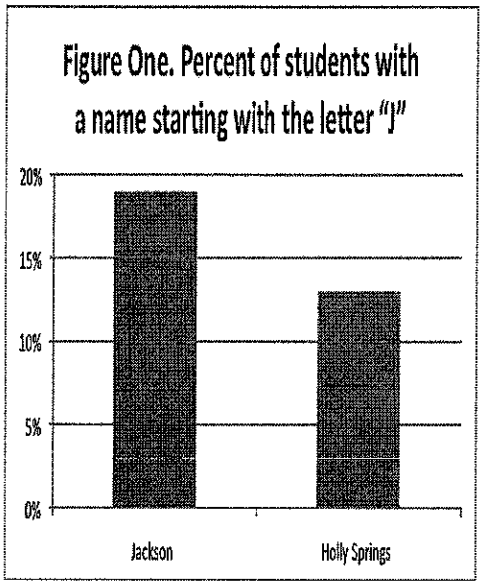
People's names vary from location to location. In certain areas some names might be more common and others less common. There are various factors that affect this name selection. One might be the parent's exposure to other cultures. Exposure can be through physically traveling to different cultures, reading about various cultures or watching documentaries about a mixture of cultures. In any case increased parental education should increase the exposure to other cultures. With greater education comes a better ability to gain exposure through literature, travel, and choice of visual stimuli. This paper examines the theory that in cities with greater education rates there will be an increase in the choice of name use, as increased education should increase cultural awareness and increased cultural awareness should result in increased diversity in name selection.

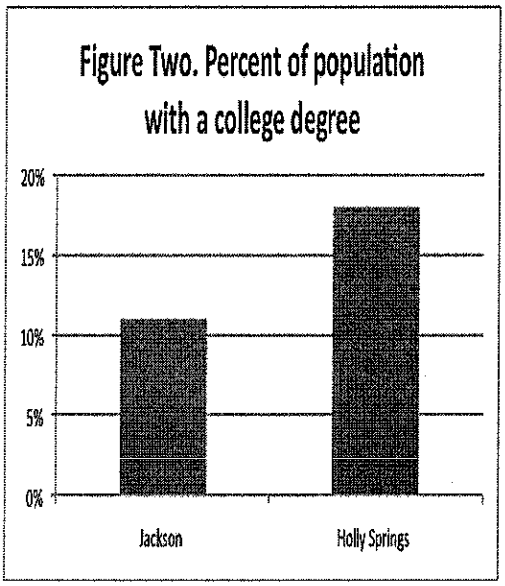
Methods:

Two cities in Mississippi were examined for this paper. They were Holly Springs and Jackson. For the name selection comparison, this report looked at the percentage of students whose first name starts with the letter "J." These percentages were compared from a teacher in Holly Springs High School, Holly Springs, and Lanier High School, Jackson. The comparisons were made on a bar graph. The city education level was also compared using a bar graph. On this graph, the percentage of city inhabitants whose education history includes a bachelor's degree was examined.

Results:

As shown in Figure One, students in Jackson Mississippi, have a name starting with the letter "J" 19.3% of the time. One hundred and twenty four students were examined from Jackson. Students from Holly Springs had a lower proportion. Only 13% of the one hundred and nine students had a name starting with the letter "J."





As shown in Figure Two, the education rate between these two cities is different. Eighteen percent of Holly Springs' inhabitants had obtained at least a bachelors level education rate. Jackson, Mississippi's inhabitants had a lower percentage of educated inhabitants. Only eleven percent of the people in Jackson attained this level of education.

Discussion:

There are a plethora of reasons for the selection of names. Certain cultures have various customs associated with the choice of names. Some name their progeny after a member in the family. This is especially prevalent within the United States, where with relative frequency the first male child is given the name of the father with the addition of a suffix such as Jr. or the first. Other cultures tend to name their children after the deity that they worshiped. In the Middle East, many children are named Mohamed. Many Catholic families use names from the saints of their religion. Peter, John, James, Samuel are all examples of common names found within the ancient Biblical writings. But what factors affect modern names?

This area of study has not been closely examined among the scientific community. However, there is a surprisingly large amount of information about this topic in the pop cultural literature. Student names from Jackson and Holly Springs were examined within this study and it was found that Holly Springs had a greater diversity in name selection. Various factors could affect this, but cultural awareness may play a significant factor.

Education is a considerable factor that pertains to cultural awareness (Banks, 1994). With more education there is a tendency for more cultural awareness (Hirsch, 1984). Sociologist Liberson, in his book about cultural influence, suggested

that culture plays a significant factor in the choice of names (Lieberson, 2002). Therefore, since education leads to increased travel (Stead, 2001; Chapman and Ryan 2002), and since increased travel leads to increased exposure to different cultures, and since cultural exposure is a significant factor in name selection (Lieberson, 2001), then increased education should yield a greater diversity in name selection.

As expected, the education level was found to be greater in Holly Springs. This would support the theory that educational level helps to create diversity among a population's name selection. Due to the limited scope of this paper the findings here are not statistically significant. However, they serve as support for the potential of further research into the unexamined area.

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An experiment gone terribly wrong. That is what my first semester of teaching has felt like. I am tinkering and trying different things in my classroom, but have yet to achieve the results that I desire. This especially has to do with my methods of instruction. Throughout my teacher corps experience, I have been conditioned with the idea that my students need to be involved in inductive learning, a process of learning through exploration. I have also been conditioned with the idea that I need to vary my instruction in order to meet the needs of all students. These are 2 ideas in science instruction that I tend to agree with but have found difficulties implementing in the classroom. First of all, I went to school where there seemed to be a healthy blend of both inductive and deductive learning experiences. These 2 seemed to balance each other out and I think both were successful in my education.

I however, was curious as to how my students learned best, and whether or not they benefitted most from inductive, or deductive learning strategies.

In order to test this I decided to set up a mini-experiment. In the month of October, about midway through my first semester of teaching, my physical science classes were studying temperature and thermal energy, and the effect that it has on the motion of particles. I wanted to reinforce the fact that temperature is the average kinetic energy of particles and as temperature increases, so does the movement of particles. In order to do this I would use a demonstration, as well as supplement the demonstration with some guided reading and lecture. The demonstration would involve the speed that food coloring would spread throughout 2 different beakers containing water at different temperatures. One beaker would contain room temperature water while the other beaker would contain ice water. I hoped that by showing that food coloring spread throughout the room temperature beaker faster, students would recognize that there is a relationship between temperature and the motion of particles. I decided that I would test this experiment with 2 different classes, one of which I would use the deductive approach while for the other class I would use the inductive approach. There is an inherent flaw with my experiment in that I will not be testing both conditions on the same students. This however, cannot be avoided because I can't teach the topic to both classes twice, as more students will get the answer right the second time anyway. To combat this experimental design flaw, I chose to run the experiment with my 3rd and 5th period classes. This is because 4th period contains numerous special education students, and 3rd and 5th period were more similar in their academic achievement up to that point in my class.

I chose to use the inductive approach with my 3rd period class. We began the day with some guided reading questions/notes. This gave the students a chance to read about the topic along with a chance to answer some questions over key points that we would be discussing that day. Following the reading, I lead a discussion of the key concepts as we answered questions from the guided reading together and I rewarded the students with tickets for correct answers(my class reward system for participation). Once we had completed reviewing the guided reading questions as a class, I had a couple of students join me at the front of the to model how heat makes particles move faster. I also took the time to talk about examples of heat and particle motion, such as grease popping on a skillet and boiling water.

Following the discussion and lecture on the key concepts of the day, I decided it was time to see if my students had caught on to the concept that I was so subtly trying nail into their brains. I pulled out the beakers containing ice water and room temperature water and explained that I was going to simultaneously drop 1 drop of food coloring into each of the beakers and it was their job to predict which beaker would change color the fastest. I posed the question and asked anyone if they had a guess. One student, a basketball player who rarely participates in class discussions raised his hand, "I think it will travel fastest in the ice-water because when the dye hits the ice cubes it will spread out from side to side quicker and change the color of the water quicker." A couple of other students disagreed stating that the ice cubes would actually slow the food coloring down because, the food coloring would have to physically maneuver it's way around the ice in order to spread. I complimented both sets of students for their ideas, but I still hadn't found what I was looking for. Suddenly a hand shot up from the back of the room. The hand belonged to one of my quieter students, a very bright young man but it was rare indeed that he had anything to say in class.

" I think the dye will spread faster in the room temperature cup." he stated quietly and calmly.

"Why do you think so?" I asked.

"Because the molecules are moving faster in the room temperature. The ice water is really cold, and molecules don't move very fast when it's cold," he explained. Several students who had been quiet before voiced their agreement with this hypothesis.

I was thrilled upon hearing this, but I tried not to let it show as I complimented my student for his excellent thought process. I decided it was now time to begin the demonstration. I simultaneously let both drops go and my students watched the rapid migration of dye through the room temperature beaker and the much more sluggish migration of the dye in the ice water. While my students began to notice what was going on I tied the demonstration in with the lecture and reading for the day, and then proceeded to congratulate the students who correctly predicted the outcome of the demonstration. On the quiz the next day, over 75% of my students correctly identified the relationship between temperature and particle motion.

During 5th period I performed the same procedures but in opposite order. I began with the food coloring demonstration, and then followed up with guided reading questions, lecture and models. The demonstration yielded many different opinions and reasoning but none correlated temperature with molecule motion. The notes and guided reading filled in the blanks and I explained what actually happened in the food coloring demonstration. The next day roughly 60% answered correctly on the quiz over temperature and particle motion.

This experiment may yield some to believe that my students learn better through deductive reasoning than inductive reasoning and that I should employ more deductive reasoning in my class. However, one must remember that I used two different variables not on a single sample of subjects, but on 2 different samples. The fact that this inevitable and unavoidable situation occurred definately had some effect on my data as well as the fact that I didn't run numerous experiments. I have found that both deductive and inductive learning each work best for different

types of people. It is important to employ both in instruction in order to maximize one's effectiveness as a teacher. I believe that it is the teacher's job to decide which jobs and activities would be best taught through inductive learning, and what topics would best be discussed through deductive learning. If I have found any trend that seems to be consistent, it is that more advanced students benefit from inductive learning, while more special education students benefit from deductive learning, though I don't have stats to back that up.

Adults vs. 8th Grade Critical-Needs Science Students:

A Comparative Study

By: Sara Rowley

November – December 2008

Introduction:

I teach six periods of eighth grade science at Solomon Middle School in Greenville, Mississippi. Three periods are regular education classes, two are inclusion, and one is challenged (accelerated). I recently administered a unit exam covering a variety of genetics, heredity, and DNA subjects. The test was given in two parts over the course of two days. Students took the short answer part of the exam on day one and the multiple choice part on day two. Overall, most students were very successful on the short answer portion of the exam, often scoring a perfect score due to extra credit opportunities. However, students were considerably less successful on the multiple choice part of the exam. I was discouraged by how poorly my classes performed, especially considering my obligation to prepare students for the 8th grade state science test coming up in March 2009 (also multiple choice in format).

Out of curiosity I decided to administer the exact same multiple choice exam to some of my friends and college colleagues. The purpose of this experiment was to compare test performance by adequately prepared 8th graders in a critical needs school to that of competent adults with little to no recent scientific schooling. I wanted to see if my friends could remember anything from their 8th grade science class or if they would at least be able to use logic and test taking skills to make educated guesses. I also wanted to compare the frequently missed questions from both groups in order to determine any information about my students that could be useful in future test preparation and test making.

Results:

Scores were analyzed from eighty six students and seventeen adults. The demographics will be broken down into four categories to allow for more accurate explanation: regular, inclusion, challenge, and adult.

Demographics –

Group	Average Schooling	College Major	Ave. Grade*	Age Range	
Regular	8th grade	N/A	61%	13-15 years	
Inclusion	8th grade	N/A	48%	13-15 years	
Challenge	8th grade	N/A	79%	13-14 years	
Adult	K-12 + 4 yr degree (all at **least** = K-12, some graduate work)	6 Science related 8 Non-Science 3 No College	83%	21-33 years	

* The district grading scale indicates that any score under a 70% receives a failing grade.

Test Breakdown – I started by analyzing student scores both within and between classes. Students answered exam questions on scantron forms so that item analysis data could be easily obtained. First, I looked at each test question to determine the frequency at which students missed each question. It quickly became evident that there were about ten questions that were frequently missed by every class. These same questions were missed over and over again by a wide variety of students.

The next piece of information I looked at was the questions that were missed by *different* populations

of students. My inclusion students had the most difficulty with the test. A large obstacle for them was probably their low reading levels, demonstrated by their lower than average scores on the vocabulary questions where reading comprehension is critical. This group also seemed especially unable to use reasoning to gather information gained from one question and use it to help them answer another.

On the other hand, most of my students did very well on the short answer portion of the exam. The short answer portion had fewer questions and many open ended options in which they could receive extra credit. Most students did dramatically better on this part of the test (even some students who did not earn any extra credit). Interestingly, my students we able to accurately label five drawings without a word bank, yet they were not able to match up terms with their written definitions. I thought this was very interesting because most students were confused at first by my drawings of chromosomes, DNA molecules, and cells. However, they quickly learned to recognize the drawings and were able to make connections using the pictures that they were unable to recognize during the test with the exact same written definitions. For example, on the short answer test they had to label a picture of a chromatid (which is obviously equal to half a chromosome) while on the multiple choice test they had to tell me that two chromatids and a centromere made up a chromosome. Many students also labeled the picture of DNA "double helix," showing that they did indeed learn more advanced vocabulary and can even reproduce it without prompting from answer choices.

Next, I analyzed the variation in answers among adults given the same exam. The first and most obvious piece of information I gathered was that they, on average, scored much higher than my students (even the challenge class). On further examination, I noticed that there were only six frequently missed questions for the adults (compared to ten for the students). I also noticed that there were fifteen questions that zero or only one adult missed. This was dramatically different from the students scores; it was rare to come across a question that no student in a particular class missed. To me, this indicated that the adult test could be broken into two simple categories: *simple* questions that could be answered with logical thinking (even with a limited scientific background) and *difficult* questions that require scientific understanding to answer correctly.

The adult population did very well with the vocabulary questions. Only one of the nine vocabulary questions was ranked as difficult while the others were rarely missed by anyone. This data lead me to believe that any literate adult with a reasonable vocabulary and reasonable awareness of general scientific terminology would be able to ignore the distractors and match up vocabulary words with the correct definitions. Using reasoning to pair words with their definitions is a skill that is practiced in every discipline, not just science.

Interestingly, the adults often missed the first question on the exam, while none of my student classes found this question difficult. The question is as follows:

> 1. Put the following into order from **smallest** to **largest**. (Many of the things on the left make up one of the things on the right – remember the example from the last 9 weeks – cell > tissue > organ > organ system > organism).
> a. nucleotides > 1 sugar, 1 phosphate, & 1 base > DNA > chromatid > chromosome
> b. chromosome > DNA > nucleotide > 1 sugar, 1 phosphate, & 1 base > chromatid
> c. 1 sugar, 1 phosphate, & 1 base > nucleotide > DNA > chromatid > chromosome
> d. 1 sugar, 1 phosphate, & 1 base > nucleotide > chromosome > DNA > chromatid

The first question used a concept we learned as a class in the first nine weeks and applied it to our unit on genetics. This was not a method I found in any textbook, but was made up to help my particular students relate a confusing idea to something they had already figured out. Since this idea was generated by my students and me, it was not as common knowledge to many of my friends. I was worried my students would do poorly on this question because it seems to require detailed memorization, but they were able to successfully use what they knew about each term to help them put the ideas in order. This was one question where my students did very well recalling information when they did not need to know any specific test taking skills to be successful.

Conclusions:
The adult population I tested did much better than I thought they would based on the length of time it has been since most of them took 8th grade science or learned about genetics (even most of the college educated science majors were in chemical or earth science fields, not life sciences or genetics). On average, the adult population did a good job using test taking skills to help them navigate unfamiliar information. The adult population, however, did worse on questions that were specific to my classroom instruction or questions where each answer was equally homogeneous and so even careful reading could not help them eliminate incorrect choices without some background knowledge of the topic being tested.

My students, on the other hand, need to learn test taking skills. Many of them seemed to be unable, or unwilling, to take the time to logically think through multiple choice answers and successfully use process of elimination to get rid of obviously wrong choices. For my inclusion classes, reading appeared to be another large barrier, made evident by the high occurrence of missed vocabulary questions, despite the fact that I was there (and in one class an inclusion teacher was also available) to help them read and sound out questions. I noticed that many students paired the same definition with multiple terms, a mistake that was rare among the adults. To me, this showed how careful rereading and logically self checking answer choices can make the difference between a passing and failing grade.

Because of this information and the information gathered from the short answer test, I will try to give more open ended exams in the future. I mistakingly thought that since their writing skills were underdeveloped, giving them answer choices would be the best way to access the information they truly knew, but couldn't put into words on their own. It seems I had it completely backwards. My adult friends were able to use their test taking and logical skills to fill in the gaps in their knowledge, while my students had the knowledge, but not the means to express it. One problem I encountered with the open ended exam questions was that my lower level students were completely unable to answer questions correctly. For the drawing of a DNA molecule one student wrote "meiosis." I think I need to blend both approaches by giving students open ended opportunities to express *anything* and *everything* they know while giving them appropriate vocabulary and concepts to structure their responses.

Oddly enough, it seemed as if most of my friends cared more about the outcome of the exam than my students. For my friends, getting a bad grade would have been embarrassing because they value themselves as thoughtful, intelligent people who strive to succeed. I saw very little of this outlook from my students. Many seemed discouraged and went into the test with a defeated attitude. Some rushed to randomly fill in bubbles so that they could be done with the test. I will work to better my tests and I will try to teach test taking skills. However, it will be hard to create a scientifically literate people if the people do not want to be educated.

Limitations: Almost all adults were white, middle-classed, and from the Western United States. Many

of the adults went to the same middle and/or high schools or are part of the same family. Also, adults were not given the test in the same school setting as the students. The amount of distractions, noise and comfort level and time limits were all up to their discretion. Adults did not take the short answer part of the exam. The short answer part of the exam was where my students really shined, my friends and family may not have done as well on the open-ended assessment since their logical elimination/test-taking skills would not benefit them in the same ways. In the future, I would be curious to give this exam to a wider variety of adults and offer the short answer portion as well.

Genetics Test

Please DO NOT write on this test. Mark the best answer to each question on your scantron sheet.
GOOD LUCK!

A hybrid man and a homozygous woman with brown eyes get married and decide to have a baby (B = brown eyes b = blue eyes). Use the following Punnett Square to answer questions 1-3.

	B	b
B	BB	Bb
b	Bb	bb

1. What genotype must the children have in order to have **blue** eyes?
a. BB
b. Bb
c. bb
d. b

2. Is it possible for this couple to have a **blue** eyed baby?
a. Yes, because the recessive blue eye (b) allele can skip a generation.
b. Yes, because both parents carry a recessive blue eye (b) allele.
c. No, because every child will receive at least one dominant brown eye (B) allele.
d. No, because the dad is a hybrid and can **only** pass on dominant brown eye (B) alleles.

3. What percentage of children in the above Punnett Square will have **brown** eyes?
a. 100%
b. 75%
c. 50%
d. 0%

4. Put the following into order from **smallest** to **largest**. (Many of the things on the left make up one of the things on the right – remember the example from the last 9 weeks – cell > tissue > organ > organ system > organism).
a. nucleotides > 1 sugar, 1 phosphate, & 1 base > DNA > chromatid > chromosome
b. chromosome > DNA > nucleotide > 1 sugar, 1 phosphate, & 1 base > chromatid
c. 1 sugar, 1 phosphate, & 1 base > nucleotide > DNA > chromatid > chromosome
d. 1 sugar, 1 phosphate, & 1 base > nucleotide > chromosome > DNA > chromatid

5. Chromosomes are made of...
a. two chromatids held together by one centromere
b. two centromeres held together by one chromatid
c. two nucleotides held together by one DNA molecule
d. two DNA molecules held together by one nucleotide

6. When we studied the human reproductive system we learned that the female sex cell is called an *egg* and the male sex cell is called a *sperm*. Which process creates new eggs and sperm and how many chromosomes will each cell contain?
a. MEIOSIS creates sex cells with 46 chromosomes
b. MEIOSIS creates sex cells with 23 chromosomes
c. MITOSIS creates sex cells with 46 chromosomes
d. MITOSIS creates sex cells with 23 chromosomes

Match the following vocabulary words to their definitions:
7. genotype
8. phenotype
9. allele

a. an organism's physical appearance
b. a different form of a gene
c. a small section of DNA that carries genetic information about a trait
d. an organism's genetic makeup or allele combinations
e. the passing of traits from parents to offspring

Match the following vocabulary words to their definitions:
10. gene
11. heredity
12. genetics

a. the scientific study of heredity
b. a different form of a gene
c. the passing of traits from parents to offspring
d. an organism's physical appearance
e. a small section of DNA that carries genetic information about a trait

Match the following vocabulary words to their definitions:

13. sex linked gene
14. messenger RNA
15. mutations

a. a chart or "family tree" that tracks traits among family members
b. a change in a gene that can be good, bad, or neutral
c. a gene that is carried on the X or Y chromosome
d. ribonucleic acid that copies the information from the DNA in the nucleus and carries the message into the cytoplasm

Match the following phenotypes with the correct genotype for the color-blindness trait:

16. normal male
17. carrier female
18. color-blind male

a. XY
b. XX
c. X^CY
d. X^CX
e. X^CX^C

19. Which of the following **genotypes** is a hybrid? (R = round, r = square)
a. RR
b. Rr
c. square
d. round

20. Which of the following **genotypes** is homozygous recessive? (T = tall, t = short)
a. TT
b. Tt
c. tt
d. short

21. Which of the following **phenotypes** is dominant? (B = brown, b = blue)
a. bb
b. BB
c. blue
d. brown

22. Mutations can occur during **meiosis** when...
a. chromosomes don't separate correctly
b. base pairs are accidently switched
c. DNA unwinds and "unzips" between base pairs incorrectly
d. Too many body cells are made

23. The **first** step in DNA replication is...
a. DNA makes an exact copy using the base pair rule
b. DNA unwinds and "unzips" between base pairs
c. RNA copies the DNA in the nucleus
d. RNA attaches to a ribosome

24. The **second** step in DNA replication is...
a. DNA makes an exact copy using the base pair rule
b. DNA unwinds and "unzips" between base pairs
c. RNA copies the DNA in the nucleus
d. RNA attaches to a ribosome

25. Nucleotides are made of...
a. many sugars, many phosphates, and many bases
b. one sugar, one phosphate, and one base
c. chromatids and centromeres
d. DNA and ribosomes

26. Which part of the cell makes proteins?
a. chloroplast
b. nucleus
c. mitochondria
d. ribosome

27. A squirrel has a mutated gene that makes its tail shorter and weaker than normal. Squirrels use their long tails for jumping between trees.

How might this mutation affect the squirrel? **Will the mutation be good, bad, or neutral?**

a. The squirrel will learn to spend all of its time on the ground with the dangerous cats and cars – **neutral**
b. The squirrel wont be able to jump well and so it can't find food, run away from danger, or find a home – **harmful**
c. The squirrel will look cool because of its tail – **harmful**
d. The squirrel will die because it can't jump well – **helpful**

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My Success Story

My first semester of teaching at Provine High School has been a continual learning experience. I have tried numerous instructional activities to keep my students engaged and to ensure that they are efficiently learning the content that I have presented to them in class. So, here is an explanation of three aspects of teaching that I have found to work relatively well: recall, revisit, and remember.

As a review exercise before taking a quiz in my Biology I classroom, I have my students take about ten (10) minutes to complete their "Do Now" exercise for the day, which works as a review to compliment the review game that follows. The "Do Now" forces the students to recall the information that they have learned in its most basic form (definitions, matching, etc.).

After going over the "Do Now" exercise, I allow the students an additional ten (10) minutes to review their notes and ask any questions that they may have, pertaining to the content of their quiz. If there are no questions, I began prompting the students, using a list of questions that I've accumulated. Those questions are based on the problem areas that I have observed while teaching the content in class. They also include problem areas that the students may meet while taking the quiz itself. Leaving the floor open for questioning allows the students to revisit the material that they have studied, and ask questions accordingly.

To follow-up the verbal review, the students play a review game so that the students have a fun way to remember the content they're about to be assessed on. The

games that I've used thus far include Biology Baseball, Jeopardy, Bingo and variations of Quick-Answer games. The review game that I've found to be most successful is the Battle of the Sexes Jeopardy game. My students love separating into groups by gender and winning this review game, so that one gender can brag about being smarter than the other, until the next review game. So, when we play Battle of the Sexes Jeopardy, they get very competitive and (most importantly) very focused. Here is how the game works:

1. The class is separated in half, based on gender.
2. The teacher reads the instructions for the game (no communication between teams, no taunting, etc).
3. To answer a question, the student must raise their hands.
4. The first hand seen by the teacher will be given the opportunity to answer the question.
5. The question can be read three (3) times. After the third repeat of the question, the student has ten (10) seconds to answer the question.
6. The teacher keeps a tally of the scores on the board. The winning team will receive "X" amount of points on their quiz.
7. The teacher does a demo to show how the game should flow.
8. Enjoy!

Classroom De-Golemization
(Theory vs. Practice)
by Mike Warner

I chose my senior psychology thesis with the knowledge that I wanted to pursue a career in teaching. I also knew my first foray in teaching was likely to be in a low-income, low-performing area such as Mississippi as I was applying to programs that focused in these areas. Therefore, my research brought me to the subjects of motivation, performance, expectations and self-fulfilling prophecy. The focus of my thesis was studying the effects of expectation on performance in both a positive and negative way. This lead me to research the Pygmalion and Golem effects, when high expectations yield high performance and the inverse. The Pygmalion and Golem effects have been studied extensively in educational, military and commercial fields on how leadership can either improve or hinder gains in subordinate performance.

The most compelling and relevant studies I found that I thought would aid in turning around the culture were done by the Israeli military. The specific studies were done on the female members of the Israeli military who believed they could not be successful soldiers. Military psychologists found that many female soldiers had doubts about their abilities to be effective soldiers, as societal expectations never placed them in this role. The efforts of the psychologists and military leaders were first to dispel this belief by intensive pre-training that attempted to make the under-performing believe that initial performance on military tests was not a prediction of future performance. Then when those units underwent training, the leadership focused on making sure the lowest-performing recruits were continuing to improve by offering positive reinforcement. The tests showed that units who had pre-training and those whose leaders focused on the lowest-performing recruits found the greatest overall leaps in unit performance on athletic testing.

Another important study I found was an educational study done on increasing students Intelligence Quotient. Students with low Intelligence Quotients had their IQ monitored from 1st to 9th grade. These students' . were found to have increases until 2nd grade at which point they leveled off. Initially, even the researchers doing the investigation felt Intelligence Quotient was set after second grade. However, when the students were tested during their 7th grade year, a statistically significant jump of 3 points for the group of students was found. The study attributed this to the students changing schools, and the teachers in this environment having no knowledge of previous student performance. Therefore, since all students were given the same level of expectation, increases in student performance of the lowest performing students occurred.

Mississippi has many regions in which the socioeconomic and historical stereotypes offer a

large resistance to equality of learning, and I would liken it to a statewide Golem effect for underprivileged and minority students. The studies which I feel they can be likened to the most are those of the lack of ability to produce a Pygmalion effect in women. The trait anxiety associated with being impoverished and black in the Southern United States makes the heightened expectations that have been attempted either ineffective or unable to compete with those parts of Mississippi and other parts of the country which don't have such endemic stress in the system. I believe the lack of general self-efficacy and self-task concept also interferes with the education of minorities and the lower class. This is because minorities especially feel they have certain roles to which they are suited, but feel that jobs in academia especially in the sciences are reserved for whites or Asians. This is the current self fulfilling prophecy espoused even by some segments of Black Culture. Therefore, as with women, since these roles have been engrained in the psyche of minorities in the United States for generations, it is hard to overcome these expectations, even with expectations for high achievement from an effective and motivated leader.

The school district which I have been assigned to is Holly Springs School District. The average discrepancy between statewide scores on Math, Reading and Writing are all 20%. The district population is also 98.2% black and is one of the most impoverished areas in Mississippi. As seen with examinations into the effectiveness of Pygmalion in the elevation of IQ, previous expectation with knowledge of students' past performance not only can create a self-fulfilling prophecy among students, but can leave educators with the belief that having high expectations for students who have performed poorly historically is pointless. The problem is multifaceted and extends from the system, the teachers and the students themselves.

My plan I had, in order to rectify this situation, was to first attempt to deconstruct the notion that students couldn't succeed by giving examples of successes in the fields of science and mathematics from their own culture. The second step would be to target the students performing at the lowest end of the spectrum in order to breed confidence in them, which in theory would be transferred to the middle and higher performing groups. The last step was to have no pre-conceived notions about student performance on my part, believing that all students had an equal opportunity to succeed despite previous achievement. This was my plan prior to experiencing the problems of the educational system in Mississippi first-hand.

I started implementing my plan by giving a historical account of the subjects I teach, Algebra II and Biology II to my students. I explained that Algebra comes from an Arabic work meaning, "completion" and many concepts of Algebra used today were pioneered by an Moroccan mathematician named Al-Khwarizmi, showing that people from the African descent played a role in the subject we were studying. I also realized that many students were struggling with basic math concepts, such as negatives

and fractions, and spent time at the beginning of the year addressing these topics, as well as reviewing all Algebra I topics. This was focused at the lower performing students, and I felt that if they had confidence, all of the students in the class would be prepared to perform when we moved to Algebra II topics. Throughout the year I have continued to focus on basic calculations when working through examples to reinforce these basic concepts repeatedly and allow the lower performing students to have maximum exposure to these topics.

I have found that the results garnered from military tests which focus on athletic performance do not have the same impact as those which focus on academic performance. The advances I have seen are less dramatic, but still positive. Many of my smaller classes in which students have the ability to focus and work in groups and as a team have seen drastic improvements in reducing simple math errors and are now able to be exposed to more difficult topics without immediate fear of failure. I found initially the students were hesitant to learn new topics because their basic math skills would hinder them from achieving the correct result. Now, because I have focused on the lower end of the spectrum, in these classes the entire class is performing at a higher level.

However, I have also seen my plan fail in implementation in my larger classes which happen to have the most lower performing students. It appears that a critical mass of students of lowered expectations can make it difficult for de-golemization techniques to be effective. In these classes the battle to focus on the lower-performing students is difficult, because of the sheer number and the resistance encountered. I also found myself being discouraged in these classes and lowering my own expectations, which is counter-productive to all of the research which I found. This type of class manifests in the most clear way why academic implementation of military de-golemization techniques used by the Israeli military is less effective. In military tests, results are tangible and more immediate, and improving physical performance requires little previous experience. Some of the students I have encountered lack the basic skills required to succeed in math, which require years to develop. The constraints of pacing guides require that I move on to Algebra II topics and focus on the higher-performing students at some point, which I have been forced to do in these classes. Therefore, they now move at a sluggish pace compared to my smaller, more motivated classes.

The first obstacle I faced in implementing my plan was an unforeseen hindrance, the classroom management challenges which exist in the Holly Springs School District. Before coming to Mississippi, I had no concept of the extent of the lack of discipline the students display. I should have coupled the lack of internal motivation students have with a breakdown in the discipline structure, but I was initially taken aback by the scope of this problem. The second obstacle I faced in implementing my plan was dealing with my own expectations and performance. I had very high expectations for myself as a teacher coming in, which I still have, but my own performance as a teacher still has a great deal of room for improvement. My own expectations clashed with my initial performance levels and was giving me a great deal of unnecessary anxiety and stress. Once I realized I am a first year teacher and am still learning the craft myself, I was able to implement my plan in a way which has seen some success. As my own leadership and teaching abilities grow, I intend to continue my efforts to bring give higher expectations to

my students, and shift the expectations from an external source to an internal source. Many of my students still have a Self-fulfilling prophecy that success in math and science is beyond their reach. However, the few students who are beginning to have an internal locus of control for their performance gives me hope that when I have more experience and a greater classroom leadership ability, the results I see from using this model for raising performance will continue to improve.

Baby-Mama Scientists

"When, I was on the phone with Fatty last nite I ask him some question the 1st How much do u ♡ me? and he ask me how much I think and I ask him how do he know he ♡ me and he said he felt a connection when we first start talking he want us to be together and I do love him and he said before he left he was trying to go with me but didn't get his chance because he left. An I quiet he said J.S.B. I ♡ you and said u hear me I said wat I ♡ u and he said he pray dat I be pregant cuz he want me 2 be his babymama soon his wife. B, I believe Fatty the one for me."

This note, intercepted from one of my students, demonstrates one of the biggest challenges to my teaching: most of my students are focused on high school social relationships, rather than science. In my school in the impoverished area of the northern Mississippi Delta, this often translates into a specific mentality--that of Baby-Mama Culture.

In Baby-Mama Culture, young girls have defined their definition of womanhood by having a baby. This is ingrained in the minds of girls and appears not only in notes intercepted by the teacher, but also by waddling 15 year olds with bellies sticking out in the hallways, drop-outs from school who take care of their child instead of getting a diploma, 16 year girls bouncing their 9 month olds around at the football games, and 9th grade girls on extended maternity leave that request to get their classwork sent home for months at a time. This is not surprising in a public school in rural Mississippi--a state where teenage pregnancy is one of the highest in the U.S., which is in turn the industrialized nation with the highest percentage of teenage pregnancies in the world; a state where whites and blacks are still segregated by schools, where blacks, who have higher teenage pregnancy rates than whites, are found in the poorest areas in the most underfunded public schools. Many students do not make the associations between teenage pregnancies and high poverty and low education levels. They do not know that their school, with approximately double the rate of teenage pregnancies as the nation average, is an anomaly. They have been brought up in Baby-Mama Culture, where young, unmarried mothers are the norm, and they do not know any better than to tolerate, if not openly accept, this phenomenon.

The causes for Baby-Mama Culture, like poverty itself, are tenuously strung together through a web of interlocking factors. As a teacher, however, the focus is on what happens in school, and a moment should be taken to address the associated sex education that the students receive. The focus of the school's sex education is on abstinence. This is expected during the era of Title V, with its provisions and its bestowment of over $250 million dollars from the federal government for promoting abstinence outside of marriage as the "only acceptable standard of behavior for young people," especially in the Bible-belt South.[2] In freshman health class, the students culminate their first semester with tri-fold boards presenting the benefits of abstinence, along with a pledge to stay abstinent.

These kinds of pledges are not working--as of 2003, 73.7% of black high school students in Mississippi have had sexual intercourse, with over a third of all students having intercourse with four of more partners.[2] The efforts of abstinence-only programs, in fact, appear to have had little effect on student behavior in states across the U.S. An evaluation of abstinence programs have determined that some of these programs do show a positive impact of sexual behavior over time--yet there is little to no evidence that these abstinence programs reduce sexual behaviors among teens in any respect during short-term or long-term periods. There is also very little evidence to show that the programs even delay the initiation of sex among teens.

The rates of sexually transmitted disease in Mississippi are some of the highest in the country, especially for gonorrhea and chlamydia. Abstinence-only sex education, in addition to failing to reduce teenage pregnancies, presents a health hazard as students are not thoroughly taught how to protect themselves against STD's when they do become active. Instead, they are simply guilted, with religious overtones, into a train of thought that tells them that they should not have sex, but does not acknowledge their desires or prepare them for good health. Sex is mistreated as being a moral issue, rather than appropriately being treated as a serious health issue, in our nation's high school curriculum.

A shocking aspect of some abstinence programs is the tendency for facts to be omitted, exaggerated, or downright false. An article in the Washington Post noted that various school abstinence

programs falsely taught students that "A 43-day old fetus" is a "thinking person", that "HIV can be spread via sweat and tears," that "condoms fail to prevent HIV transmission as often as 31 percent of the time in heterosexual intercourse," or that "women who have an abortion are 'more prone to suicide' and....as many as 10% of them become sterile".[3] The posters that the 9th graders at my school made reinforced the misinformation. Plastered over the splashy orange and green trifolds were implications that choosing abstinence is the only way to a happy marriage, that if you have sex you will not graduate high school, have a good job, or a successful life, and that pre-marital sex increases your risk for suicide and for heart disease. An article was pasted onto one poster that outlined differences between males and females in sexual relations--suggesting for the female to not be surprised or offended if a male shows interest, and implying that the female herself would have no desire and should embrace the male's attraction as a complement and be the one to say no. Exaggerations out-of-context like these are harmful to students. They present conflicting information, and do not prepare students to make educated decisions.

One striking issue for the science teacher with abstinence-only programs is that they are, in effect, anti-science:

> "The abstinence-only approach to sex education is not supported by the extensive body of scientific research on what works to protect young people from HIV/AIDS, sexually transmitted infections, and unplanned pregnancy. An assessment of the peer-reviewed, published research reveals no evidence that abstinence only programs delay sexual initiation or reduce STIs or pregnancy. By contrast, credible research clearly demonstrates that some comprehensive sex education, or "abstinence-plus," programs can achieve positive behavioral changes among young people and reduce STIs, and that these programs do not encourage young people to initiate sexual activity earlier or have more sexual partners."[4]

Due to various influences of morality and religion, administrative forces in the government and the schools have developed the abstinence programs, without having proper evidence that they are the best choice for students. Moreover, refusing to teach a comprehensive sex education program fails to thoroughly equip the students for the time when they do choose to become active--whether that time is during or after high school. An apparent result of that in my high school is the striking number of girls who become pregnant.

Though Baby-Mama Culture is only one of the many forces that influence my students, and distract their attention from curiosity of science, it is an omnipresent and striking factor. As the opening notes discloses, being a baby-mama--or, having a boy show interest in having you as his baby-mama--is seen by some students as one of the ultimate signs of adoration, love, acceptance, independence, and adulthood. It is a challenge to try to motivate students who are focused on note-passing, daydreams, or realities of this type to have interest in science. While I introduced a lab regarding viscosity, B's mind was not on academics, but on her response to the note: "That's the same way I feel about Peewee and he want me to be his baby mama too."

1) www.ccsso.org/content/pdfs/SP**MISSISSIPPI**.pdf
2) http://www.advocatesforyouth.org/publications/stateevaluations.pdf
3) http://www.washingtonpost.com/wp-dyn/articles/A26623-2004Dec1.html
4) http://www.popline.org/docs/1506/195727.html