I. Introduction

I decided to write most of paper about motivation because motivation is something that is lacking in several of my students in Junction City. I want to help students develop the motivation to learn math instead of hearing the bad attitude they have developed for mathematics. It is so frustrating to hear a student say that they do not care. Also in my paper, I plan to intertwine the topic of retention. My paper will lean more towards retaining students in math at the middle school level rather than college like the articles we read in class. I know that students can not switch out of math in the middle school, but they can choose to take many math classes in high school and choose a major in college for math. In other words, I want to find out ways for students to be interested in math field so they continue in the math field all the way up through college graduation. I have developed several great relationships with my students and care deeply about what the future holds for them. My goal is to make a difference in their life by motivating them to like math and school so they do not drop out of high school.

II. Background

As I researched for articles dealing with motivation, the most common information that I found was strategies for increasing motivation. Some of the articles showed actual studies where certain strategies helped the student want to learn. The “Intrigue Model” by Lewkowicz is one strategy example that I will be writing about. Another article I found explained different types of motivation, which motivation is the best to have, and factors that influences the development of student motivation. Robert Case wrote a paper about a study he did in an India high school watching for where their motivation comes from. I even found an article where school leaders
play a big role in helping generate student motivation. Only one article I found discussed high school dropouts and the reasons for dropping out.

From the articles in class, I will talk about three of them that relate to retention. Treisman’s article showed how a math workshop could make a huge difference in the retention of math students at the college level. This workshop can be related to a middle or high school setting. Malcolm’s article gave several useful strategies that help students succeed. She also helps point out some of the down falls to Treisman’s workshop. Lastly, I will talk about Seymour and Hewitt’s article, which gave an overview of why people may leave the science, engineering or mathematics majors.

III. Précis

Have you ever heard a parent complain that their pre-schooler is unmotivated? Probably not. At a young age, curiosity develops a motivation to want to learn, but the sad fact is that motivation for learning frequently seems to shrink. A child’s home environment is the place where the attitudes develop towards learning. Parents need to encourage this curiosity to know the world around them by answering their questions. By encouraging them, children will see learning as fun and worth their time. Once a child starts school, they begin to form beliefs about what they succeed in and fail in. Students will relate their failures to lack of ability or lack of effort, which will follow them throughout school in every learning situation. (Lumsden)

1. What is motivation?

Student motivation “refers to a student’s willingness, need, desire and compulsion to participate in, and be successful in, the learning process.” (Brewster) There are two different types of motivation: extrinsic and intrinsic. Before I explain what they mean, let me say that there is a fine line between the two types. In other words, it is rare to find only one type of
motivation within a person. I would say everyone has both types of motivation, but it depends on the situation for which type(s) of motivation would arise. Extrinsic motivation is “when he or she engages in learning purely for the sake of attaining a reward or for avoiding some punishment.” (Brewster) Basically extrinsic motivation is when a person only does something for an external reward. Intrinsic motivation is when a student “learns out of curiosity, interest, enjoyment or in order to achieve their own intellectual and personal goals.” (Brewster) Intrinsic motivation is the best to have because the motivation comes from within the person’s self will or internally. Intrinsically motivated students retain information and concepts longer. They also more likely to be a lifelong learner even after the formal school setting. Most successful people have both intrinsic and extrinsic motivators. (Brewster)

2. Research on the types of motivation

Research has proven that extrinsic motivators can lower achievement and negatively affect student’s motivation. A student who lacks intrinsic motivation usually only does the least amount of effort to meet the goal of an activity. It has also been proven that students who are compared to their classmates are discouraged to do better, and it may even lower any intrinsic motivation they have. Depending on the student, competition could make some students more motivated because they want to be the best. Others become discouraged to do better. Some researchers will not describe student motivation as either intrinsic or extrinsic. They say that there are many complex and interrelated factors that influence motivation. (Brewster)

An example of where intrinsic and extrinsic motivation can be found is in Mapusa, Goa. Robert Case did a study on eleventh and twelve grade mathematics classes during January 2001. He found that 41 percent of the students had chosen the science stream. There were four concentration options to choose in high school, and science had the most. Case wondered why
the science field. All science-stream students have to meet for 10 class meetings, which are 45 minutes each, and they have school 6 days a week with only April and May off. That is a lot of hours compared to American schools. Another difference from American schools was the fact that the students made quiet conversations about mathematics during the teacher’s lecture. Students in my class usually talk about their personal life while the teacher is trying to lecture. Students usually take lots of notes because their country is poor and has no textbooks or graphic calculators. Case found that family, traditions of the regions, and the economy of India play a huge part in their motivation. A science-based education can help raise them out of poverty, and they often emigrate to different countries to pursue a career. They then send back money to help their families. In America, most students believe that they can be successful even if they do not study the “hard” sciences. All of these science-based students are an example of intrinsic motivation because part of the definition of intrinsic motivation is when a student “learns to achieve their own intellectual and personal goals.” It is their personal goal to achieve success for a career. These Indian students also have extrinsic motivation because they are seeking a successful job. (Case)

3. Strategies for increasing motivation

3.1 Algebra motivator

Many strategies for increasing motivation have been successful in helping a child want to learn. A specific strategy example comes for Marjorie Lewkowicz, which deals with how to teach algebra. Her “Intrigue Model” is kind of like a magic trick. The problems begin by having the students pick a number. Then they are instructed to do a series of arithmetic operations. After doing these operations, Lewkowicz can report the exact number they chose in the beginning, which really surprises the students. After she reveals the secret to finding each
person’s number, she challenges him or her to use algebra, which must include variables. To
many students in algebra, they perceive algebra as a bunch of rules to be memorized. By using
the “Intrigue Model,” students see algebra as a “creative medium.” The think-of-a-number
problems are intended to encourage interest in math. It is a step away from rote memorization.
These problems should also promote ownership and a deeper understanding of new mathematical
concepts. (Lewkowicz)

3.2 Role of assignments in motivation

The “Intrigue Model” would work great for an algebra class, but for classes other than
algebra, there are many other motivation strategies to use. In the classroom, the teacher should
use extrinsic rewards sparingly. Giving a prize for a minimum effort teaches students they do
not have to try as hard. (Brewster) The teacher must have high expectations for performance and
behavior. (Malcolm) With assignments, it would be helpful for students to see examples of what
a high-, medium- and low- level work would look like. When evaluating student’s work, the
feedback should be as soon as possible, clear, and constructive. Their work should not be
compared to other student’s in their class. (Brewster)

3.3 The teacher as the motivator

Relationships between the teacher and students make one of the biggest differences in
motivation. If the student feels welcome and supported, the student wants to please their teacher.
The teacher should respond positively to student questions and praise students for doing well on
an assignment. (Brewster)

3.4 Support Structure for motivation

The teacher relationship continues in the support structure developed in a school. At the
college level, bridge programs prepare the students for college-level work. (Malcolm)
City Middle School has a program called PM academy, which is an after school program where students can stay for an hour to get help on any assignments. At PM academy, students develop a close relationship with the teachers they are always asking for help from. Another example of a support structure could be Treisman’s workshop at Berkley. This workshop was useful to many calculus students because they were able to work other problems with their peers. Cooperative learning can benefit everyone in the group. (Treisman)

3.5 Instructional practices for motivation

For instruction, teachers need to use cooperative learning, peer tutoring, and other forms of instruction. It needs to be mixed up so students do not get bored with one specific type of instruction. The teacher should also try to use lots of hands-on mathematics. When a student sees a relationship between science and mathematics, students seem to perform better and are more motivated. (Malcolm) “Contextualizing” learning helps students to see how skills can be applied in the real world. (Lumdsen)

3.6 School leader’s role in motivation

School leaders play a big part in contributing to motivation. They need to schedule motivational speakers and stage academic award assemblies. Visible symbols should be throughout the school such as school newsletters, statement of goals, behavior codes, and symbols, which convey messages of what the school really values. Principals can manage the teacher and student motivation by shaping the instructional climate. They can lead everyone to having positive attitudes. Principles need to have ongoing energy and creativity. If students see this in a leader, it shows a sense of caring to develop motivation. (Renchler)

3.7 Attribution Retraining for the unmotivated
The goal of a student who is unmotivated is to protect their sense of self-worth. A process called attribution retraining can be used with unmotivated students. The process involves modeling, socialization, and practice exercises. There are three goals of attribution retraining. First, the teacher helps the student to concentrate on the tasks instead of the fear of failure. Second, the teacher helps the student respond to frustration by going over their steps to find mistakes and figuring out alternative ways to solve the problem rather than giving up. Lastly, the teacher helps the student attribute their failure to lack of effort, lack of information, or ineffective strategies instead of lack of ability. (Lumsden)

3.8 Proof of what strategies works

According to a study of 13-year-old students in Japan, it was proven that students learn math easier when it is put into context problems, which also helps with their problem solving strategies. Cooperative learning activities were associated with student enjoyment and also improved student achievement. In cooperative learning situations, students had multiple opportunities to obtain mathematical explanations from their peers. Also in instruction, the teacher asks many questions and does not focus on a single “correct” approach to problems. Students are motivated with several ways to do a problem because their way could be right.

From this study, student who indicated a high level of enjoyment for learning math reported that their teacher would use three strategies: math projects, working in pairs or groups, and using things in everyday life to solve math problems. Interestingly, the Japan study found that the frequency of computer use in the math lessons were not significantly associated with student enjoyment. (House) This study would say that the Geometry Sketchpad and Cognitive Tutor programs would not be enjoyable to the student. “Many believe that its use have the potential to enhance student learning and proved students access to powerful mathematical ideas and topics.”
There is no indication on whether student enjoyment is present with these two computer programs.

4. Retention of high school students

At the college level, Seymour and Hewitt did a study on people that transferred out of science, engineering, and mathematics. Some of the same reasons for dropping out in college can be related to high school dropouts. People that switched out of their major blamed it on lack of interest, poor teaching, conceptual difficulty, and lack of peer study group support. (Seymour) In the middle and high school, students could use these same reasons to not like their math class. Students need an environment where they are interested. They need a teacher who has a good subject background to teach the hard concepts. Also they need to be able to have peer group support within the class. Students with low academic ability, from lower social classes, and from minority groups typically have increased chance of dropping out. A student who is more involved in extracurricular activities is less likely to drop out of high school. (McNeal)

Extracurricular activities can go along with the fact that students develop friends who can be a part of their peer study group.

IV. Development

Comparing some of the articles, most of them contained the same type of ideas. There are people that believe there are two types of motivation, but others do not believe there are two types. The teacher and school leaders have the largest part in the motivation of everyone in the school. Teaching is a job that effects many people. The assignments, instruction, and the support structure all play a role in motivation. The teacher has to be a positive person who will help students see that their failure is not because of lack of ability.
The one thing that I did find in the articles that contradicted was the technology piece. According to the study in Japan, technology did not increase enjoyment. I would think that if students understood topics better after using Geometry Sketchpad and Cognitive Tutor then they must have enjoyed it a little. Within my own class, if we use computers, the students get very excited to do something different from the regular class work.

I believe that motivation is the key to helping all students succeed in the future. If they do not believe in themselves, that will follow them for the rest of their life. If I can help students see at the middle school level, that they are very smart in certain areas, then students will gain motivation to want to try harder. This would be an example of intrinsic motivation. Motivation is the only way to get a person to want to learn for the rest of their life. I want students to leave school believe that there is so much they do not know. If they see there is a lot to learn and they have motivation, they will want to be life long learners. Being their teacher, I have a huge responsibility to build this motivation.

V. Application

After doing all my research, I found several beliefs about motivation that were true. In my classroom, I hope to develop both types of motivations within my students. By trying to use all of the strategies I found, I think my unmotivated students could change. As their teacher, I already show lots of high expectation. I am very welcoming and supportive. Although there are times, when I do not respond very positively. After a test, I sometimes get very angry with my low achieving students. This is most likely lowering their motivation to learn algebra. I should be using the attribution retraining. The student and I should retrace the steps on a test to see where they messed up and make sure they know that they did not fail because of lack of ability, but possible lack of effort.
As for assignments, I plan to show more work examples so they know what I am expecting. I also plan to not compare their work to other classmates. The assignments, that they do not finish usually causes students to attend PM academy. At PM academy, I want to try not to loose my patience. Sometimes students just want me to give them the answers, but instead we will retrace mistakes and look at steps in other examples to find the answers.

For instruction, I already try to switch up the types of activities. Since I teach algebra, I plan to try the “Intrigue Model” as a different activity once in awhile. I want to try more cooperative learning and peer tutoring. I think I am going to try the method of asking three students around them for help before they ask me for help. In this way, they will get to hear a different way than the way I teach the topic. Also I am going to do more problem solving that is contextualized. The problems I choose need to relate to something they know about such as video games. I’ve started to do this some in my class, but I need to do it more because they act more interested when I do relate it to them. Even though the Japan study said that technology doesn’t excite students, I still think I will use it once in a while. It is something different and kids love to do something out of the ordinary.

At JCMS, we try to show motivation on our walls. We have posters with our school motto. All the teachers even wear a pendant with the motto. I do not know how many of the students even notice it though. We motivate our students with a program called Renaissance, in which students receive rewards for their grades. These honored students get to attend an assembly when the whole school attending, and they get recognized for their efforts. They also get their name on the wall in their study’s hall teacher’s room and in the hallways. By having their name on the wall and saying their name at the assembly, they have received an external reward. Then they have internal motivation when we celebrate their success as a whole school
by putting on a play, which promotes how important learning is in school. This year’s theme for Renaissance is “Wizard of A’s from “The Wizard of Oz.” Students are being motivated both intrinsically and extrinsically.

Also at JCMS, our principal is one factor that could help more with the motivation. He doesn’t seem to have the energy and creativity that a principal should have. I plan to encourage him to do more activities that raise motivation. For example, if a certain number of students made their Accelerated Reader goal, then our principal could shave his head or do something fun. The kids would love to see him do something crazy. I think it would seriously motivate some kids that do not like him.

The sad thing about student retention in school is that many of the factors can’t be controlled. Some students are born with low academic ability. Others are born into a lower social class or belong to a minority groups. Each of these three groups has an increased chance of dropping out. I cannot help any of these factors, but I can try to motivate them by my instruction, positive attitude, and attribution training. I chose to go in the education for two main reasons. First, I love to teach math, and I wanted to share that love with others. Second, I wanted to help change the lives of many struggling students. I think I belong at JCMS because there are so many students that beg for the attention that they do not receive at home. My love of math hopefully will create a motivation within each of my students.

VI. Bibliography


