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# How Have Teachers Affected the Disinterest Towards Mathematics?

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## Introduction

In the past, mathematics was perceived as "a fixed, static body of knowledge" filled with memorizing facts and practicing procedures (Fennema & Romberg, 1999, p. 4). The curriculum was one in which each course was a prerequisite for the next. The class content would consist of reviewing the homework, presenting new information through direct instruction, followed by a few practice problems for students to practice the procedure. The subject matter for these classes would include "the mechanistic manipulation of a variety of numbers and algebraic symbols and the proving of geometric deduction" (Fennema & Romberg, 1999, p. 4). This approach tends to disconnect mathematics with other subjects and the real world (Fennema & Romberg, 1999). The students learn the techniques, but fail to learn the concepts behind them. We have taught our students mathematics, but not with understanding. Fennema and Romberg wrote, "traditional school mathematics has failed to provide students with any sense of the importance of the discipline's historical or cultural importance, nor any sense of its usefulness. Is it any wonder that many students dislike mathematics and fail to learn it?" (1999, p. 5) The traditional style of teaching and learning mathematics has hindered students' learning of mathematics with understanding (Fennema & Romberg, 1999). This past perception of mathematics has been under review by the reform movement, which seeks to make mathematics a dynamic and active field of study.

## Standards

Prior to the development of uniformed standards, each state and district was responsible for their own curriculum and standard evaluation. It wasn't until The National Council of Teachers of Mathematics (NCTM), an international organization that is "committed to excellence in mathematics teaching and learning for all students" (2000, p. ix), that standards essential for curriculum, teaching and assessment were developed and created. Since 1989,

NCTM has shaped a landmark vision of mathematics education through three standards' documents. By developing explicit and broad goals for teachers and policymakers, these documents have helped to promote new ideas, focus, and ambition for the improvement of mathematics education. These three documents include Curriculum and Evaluation Standards for School Mathematics (1989), Professional Standards for Teaching Mathematics (1991), and Assessment Standards for School Mathematics (1995). In 2000, Principles and Standards were developed through the revisions of the 1989 Curriculum and Evaluation Standards. The revisions helped to outline where teachers needed to focus their attention. This document helped to decrease the attention on traditional mathematics.

NCTM has remained rooted in the belief that standards are essential in the improvement of our mathematics education system. In order for these standards to remain possible, we must continuously reexamine, evaluate, and test our teaching philosophies. In the end, it is clear that the Principle and Standards reach no unanimous agreement on addressing the way in which we can achieve our educational goals and policies. Yet, one arrives at the conclusion that these Principles and Standards have "been open, rigorous, and well informed by the views of all professionals concerned with mathematics education…" (The National Council of Teachers of Mathematics [NCTM], 2000, xv). These NCTM standards have led the way to the development of state standards and curriculum framework. They have also helped guarantee quality, develop goals, and facilitate change within our schools.

The Rhode Island Grade Level Expectations (GLEs) are based off the NCTM Principle and Standards. The GLEs provide teachers with focused expectations of what students are to accomplish. The Grade Level Expectations (GLEs) and the Grade Span Expectations (GSEs) indicate the curriculum focus at each grade level. The GLEs are goals that the Rhode Island's

Common Core of Learning identified as key aspects that students at each grade level (grade 3-8) should understand. These expectations are built on the belief that all students need to "become problem solvers and possess mathematical power. To accomplish this task of developing and achieving mathematical literacy, all students must learn to value mathematics and its importance in their everyday lives" (Rhode Island Department of Elementary and Secondary Education, n.d.). The GLEs created by The New England Common Assessment Program (NECAP) identify the skills and mathematical knowledge students should show proficiency in when taking an assessment. These concepts and skills incorporate the "big ideas" in mathematics (Rhode Island Department of Elementary and Secondary Education, n.d.) such as numbers and operations and functions. These expectations concentrate on the local curriculum, instruction, and assessment. The Grade Span Expectations are also local expectations that students will be assessed on. The difference is that the GSEs focus on the higher grades.

Many of the proposals and assertions developed in the Principles and Standards are based on educational research surrounding content areas and the ideal pedagogical content (NCTM, 2000). The Principles and Standards also reflect, "society's needs for mathematical literacy, past practice in mathematics education, and the values and expectations held by teachers, mathematics educators, mathematicians, and the general public" (NCTM, 2000, p. xii). The Principles and Standards have established a common foundation for our schools in order to establish a mathematical curriculum.

## The Ideal Classroom

In 1978, Skemp stated that there are two different subjects being taught to our students under the heading of mathematics, which include mathematical understanding and mathematical knowledge. This is the root cause of many of the problems we are faced with in today's

mathematics. So what constitutes sound mathematics? What does the ideal mathematics classroom look like? The essential problem is the fact that there is no universal agreement on what constitutes sound mathematics (Thompson, 1992). NCTM has created an ideal vision of mathematical education for the future. It discusses a setting filled with high-quality engaging mathematics in multiple facets to help build flexible and resourceful problem solvers.

Mathematics' students and teachers "value mathematics and engage actively in learning it" (NCTM, 2000, p. 3). This vision, which is described in the Principles and Standards for School Mathematics can only be achieved by revamping our educational system and the perception of mathematics as a whole. Mathematics has continuously evolved and changed in the way it is communicated through technology, the tools used, and the abundance of knowledge through the evolution of mathematics (NCTM, 2000). There are many different changes that need to be made in order for the ideal setting to take place. We must first start with society's acknowledgement of the importance of mathematics education, grades K through 12. Mathematics is "one of the greatest cultural and intellectual achievements of humankind and citizens should develop an appreciation and understanding of that achievement" (NCTM, 2000, p. 4). In today's society mathematical skills are becoming more essential. The importance of mathematics is not only in its content, but also in its ability to apply that knowledge to problem solving skills. These skills are becoming increasingly important in the workplace with the growth of technology and ancillary businesses. Many careers require "a foundation of mathematical knowledge, some are mathematic more intensive" (NCTM, 2000, p. 4). With an understanding and knowledge in the mathematical field, students will have a greater opportunity to change and impact the future. In today's society, we are looking at fewer and fewer individuals pursuing occupations in an educational path centered on mathematics, technology

and science. It is impossible for our society to continue to grow economically and function without appropriate mathematical skills, including a basic understanding of mathematics for the non-technically oriented populous.

Many sources have revealed that our students are not being enticed to learn the basic mathematical skills needed. Some students are not given the opportunity to learn, while others are not actively engaged in the curriculum (NCTM, 2000). We need to start by revamping the curriculum being taught within our schools. This curriculum must actively engage the students in the daily lessons and encourage them to be proactive in their own education. This will lead to discovery learning and the students taking responsibility and initiative in their own learning process. The students need to be able to understand mathematics and apply it to real life settings.

An effective curriculum can only be achieved if there are knowledgeable and qualified teachers teaching the curriculum with an understanding of it (NCTM, 2000). Therefore, it is critical to have a joint effort when developing the curriculum in our schools. Active involvement of teachers, administrators, parents and community members is essential to meet the goals of any new curriculum and acceptance of that curriculum. One way this goal can be achieved is through team teaching.

From the Cockcroft Report, the Curriculum and Evaluation Standards for School Mathematics, and Everybody Counts emerged a conception of mathematics where students need to be actively involved in activities within the classroom (Thompson, 1992). Students need to be challenged to use their critical thinking skills, apply the content knowledge they have learned, and communicate these ideas. Traditional teaching has primarily focused on the importance of memorizing facts, symbols, and formulas used in mathematics, but the standards have changed this focus. Yet, there is some data that supports this traditional approach to teaching. Supporters

of traditional education argue that the curriculum is misrepresented to the students and therefore reflected in the poor results on national and international assessments (Thompson, 1992, p.128).

In 1986, Kuhs and Ball identified distinct views on how mathematics should be taught:

1. Learner-focused: mathematics teaching that caucuses on the learner's personal construction of mathematical knowledge;
2. Content-focused with an emphasis on conceptual understanding: mathematics teaching that is driven by the content itself but emphasizes conceptual understanding;
3. Content-focused with an emphasis on performance: mathematics teaching that emphasizes student performance and mastery of mathematical rules and procedures; and
4.Classroom-focused: mathematics teaching based on knowledge about effective classrooms (Thompson, 1992, p. 136).

Individuals who hold the constructivist view most readily agree with the learner-focused approach. "Platonist" thinkers support the second approach, content-focused with an emphasis on conceptual understanding. Kuhs and Ball's third view emphasizes student performance as supported by individual's mastery of rules and procedures. This view is similar to Brownell, 1935, "drill theory." The last approach is based on the assumption that students learn best when lessons are structured with clear instruction (Thompson, 1992).

**Attitudes/Expectations**

What is good mathematics teaching? This question has been debated for some time with no universal agreement in finding an answer. In 1986, Hersh stated that, "one's conception of what mathematics is affects one's conception of how it should be presented. One's manner of presenting it is an indication of what one believes to be most essential to it…." (Thompson, 1992, p.127). A teacher's conception of mathematics is related to many aspects within the teaching role. The goals of the mathematics department, teacher's individual goals, the students role within the class, instructional approaches and procedures, classroom activities and units, and desirable outcomes of instruction are all different aspects that are affected by the teacher's views of mathematics.

Today's society holds a strong belief that mathematics is not for everyone. This view, which is portrayed within the community through parents and other authority figures and even the media, sends a message that it is acceptable to be unsuccessful in mathematics (NCTM, 2000). These subtle attitudes and societal acceptances by influential adults greatly influence the motivations of students within the classroom. Students become less motivated to work towards success in mathematics. This in turn increases the challenges faced by mathematics' teachers. This disengagement from mathematics creates "a serious problem not only for their teacher but also for a society that increasingly depends on a quantitatively literate citizenry" (NCTM, 2000, p. 371).

Another belief that is held by some teachers is that many students are not capable of learning mathematics (NCTM, 2000). This attitude further encourages disengagement on the part of the students towards mathematics. This is a continuous cycle that is prevalent through middle and high school grades (NCTM, 2000). However, the cycle can be broke by teachers having high expectations for all students in the classroom. By making it the responsibility of all students to learn and understand mathematics, we decrease the problem of disengagement. Students' interest in mathematics can be enhanced through engaging lessons, which center on problem solving and conceptual understanding. Students who are involved in authentic activities that connect content with the students' own lives increases what a student will learn in class.

"Teachers' beliefs, knowledge, judgments, and thoughts have a profound effect on the decisions they make, which in turn determines to a large extent what students learn in their classrooms" (Fennema & Franke, 1992, p.156). These decisions, whether during the lesson or before, play a key role in what the students learn. During planning time, it is the teacher's responsibility to decide what to teach, how to teach it, and the procedure for doing so. During the

class the teacher also makes decisions on how to adapt lessons, discipline, and the overall progression of the lesson. One essential factor in teacher decision-making is their understanding of how to best teach their students. This knowledge drives their actions by providing them with flexibility to reason, reflect, and improve on their methods of teaching (Fennema & Franke, 1992). This knowledge, which is built around a variety of experiences, continues to change as teachers face new challenges. Through research on these decision making approaches and the knowledge of teachers, educators can now see that knowledge and beliefs greatly influences how the teacher interprets and implements the curriculum (Thompson, 1992). Research has also reflected that many teachers treat their beliefs as knowledge (Thompson, 1992). In 1998, Ernest stated that teachers' approaches to mathematics depend "fundamentally on their system of beliefs, in particular on their conceptions of the nature and meaning of mathematics, and on their mental models of teaching and learning mathematics" (Thompson, 1992, p. 131).

Beliefs are different for all teachers. It seems that many of the teacher's beliefs come from past experiences in the classroom, their own schooling years and time spent as a student in mathematics. Teachers' views of mathematics according to Thompson are constructed from what is considered appropriate control in teaching, mathematical understanding, and the difference in perceptions of the purpose of lessons (1992). Another reason for differing views can be derived from that fact that many teachers do not have the complete knowledge and skills for the ideal teaching setting.

Everybody Counts places great emphasis on the need for the change in perception and attitude towards mathematics by the public (McLeod, 1992). The United States has a track record of believing that mathematical success is achieved more with ability than effort (McLeod, 1992). Society, as a whole, is more likely to accept poor performance in mathematics than in

other subjects. This ignorance of poor performance is accepted without embarrassment. Society views a lack of accomplishment in mathematics as something they have little control over. When mentioning a student's performance, teachers are just as likely to mention the student's hostility or enthusiasm towards mathematics.

**Skills Knowledge Base/Preparation**

Knowledge isn't static; it is quite dynamic and changes constantly with new experiences and increased education. A teacher's knowledge isn't simply the content he or she teaches, but also includes many other facets, such as general pedagogical knowledge, pedagogical content knowledge, curricular knowledge of learners, and knowledge of educational aims. Shulman points out that "the key to distinguishing the knowledge base of teaching lies at the intersection of content and pedagogy" (Fennema & Franke, 1992, p. 162). In order to be an effective teacher, one must be able take his or her content knowledge and present it in a way that the students easily understand it. Teachers need to know the level and limits of their students' ability to comprehend the subject content so they can apply what they have learned. In order to accomplish this the teacher must be able to understand the underlying processes and the relationships between different concepts, which includes the ability to bridge the gap between the student's prior knowledge and newly learned knowledge. A teacher usually turns to a textbook and seatwork assignments that focus on static factual knowledge and computation when his or her knowledge is lacking in that content area (Fennema & Franke, 1992). "The teacher's view in how teaching should take place in the classroom is strongly based on a teacher's understanding of the nature of mathematics not on what he or she believes is the best way to teach" (NCTM, 2000, p. 370). A teacher's understanding of mathematics allows for effective questioning and higher order thinking (Trimble, 2003).

When students are encouraged to think above their level of comfort, they have the opportunity to develop a better understanding of the material, which inspires them to increase their level of learning (Trimble, 2003). Effective teachers provide activities were students are engaged and challenged. In order to properly facilitate these activities, the teacher needs to be prepared for a wide variety of solutions (Allen, Borkovitz, Lesser, McDuffie & Smith, 2005). With these solutions a teacher must be able to listen with an open mind towards different approaches. A teacher needs to be able to sort out the incorrect methods and guide students to the correct ones (Allen, Borkovitz, Lesser, McDuffie & Smith, 2005). "As teachers begin to understand the meaning of the mathematics they are teaching, the classroom begins to look and sound different because students shift to understanding, inventing, and making sense of the mathematics they are studying" (Allen, Borkovitz, Lesser, McDuffie & Smith, 2005, p. 6). When the students are able to connect, build and interpret math through different approaches, they are better able to reach their full potential.

Society is generally in agreement that what a teacher knows is one of the most important influences towards what is presented in class and in turn what the students learn (Fennema & Franke, 1992). It has been stated that "one of the most widely offered explanations of why students do not learn mathematics is the inadequacy of their teacher's knowledge of mathematics" (Fennema & Franke, 1992, p.148). The environment of a classroom can also be affected by a teacher's knowledge of mathematics. When a teacher has a conceptual understanding of mathematics, the classroom instruction is affected in a positive manner (Fennema & Franke, 1992). Here again, conceptual understanding can be divided into two facets; the nature of mathematics itself and the mental organization of mathematics from the

teacher's perspective (Fennema & Franke, 1992). Research has shown that there is a positive relationship between content knowledge and classroom instruction (Fennema & Franke, 1992).

In order for teachers to develop a curriculum that facilitates learning, they must be able to represent mathematical ideas through real world situations, and concrete representations (Fennema & Franke, 1992). When a teacher's knowledge is organized in a manner that explains the relationships and connections between different ideas, students are better able to understand the content being taught. When teachers have strong content knowledge, they are able to create real world connections and meaningful activities for the students (Trimble, 2003). Effective teaching occurs when teachers not only understand procedural knowledge rules, but the interrelationships behind them. An effective teacher knows what prior skills a student needs along with the skills that will follow in the later grades (Theory and Practice: Mathematical Knowledge for Teaching, 2005). Students must view these skills as a connected body of knowledge rather than separate procedures. There has been an abundance of research supporting the idea that knowledge is better retained when students are able to link their prior knowledge with their newly developed knowledge and understand the processes behind the mathematics (Fennema & Franke, 1992).

Cognitive psychologists see teachers' thinking as being directly influenced by their knowledge. This in turn guides their actions in the classroom. According to Peterson, teachers need to be able to understand their own thinking before their content knowledge will be helpful in developing and structuring an environment in which facilitates learning (Fennema & Franke, 1992). Subject matter knowledge enables teachers to provide conceptual explanation as well as to connect topics within their subject. These teachers are more likely to see problem solving as a main focus to mathematics instruction. In comparison, if the teacher's knowledge of the content

being taught is poor then the lesson will suffer. This also pertains to the teacher's prior subject matter knowledge and background with the content. The classroom instruction, which includes the structure of content being taught, and the activities used will also be affected.

There needs to be more research surrounding the relationship between teacher knowledge and student learning (Fennema & Franke, 1992). Research is needed in the area of whether or not knowledge about learners is useful to teachers when making decisions surrounding curriculum (Fennema & Franke). Teachers must continually be allowed to increase and add onto their professional development. A teacher needs to be able to adapt and stay on top of the changing technologies and curriculum changes. In order to accomplish these tasks, teachers need to continuously adapt their instruction and build on their knowledge of how students learn. All mathematics' teachers know some mathematics, the question is how much and of what sort?

A paper, presented at the Annual Meeting of Japan-United States Teacher Education Consortium, stated three types of knowledge needed to become an exemplary teacher. This knowledge is comprised of what Vivienne Collinson calls professional knowledge, which includes subject matter, curricula, and pedagogical knowledge, interpersonal knowledge, which includes relationships with students, the education community and the local community, and lastly intrapersonal knowledge, which includes disposition, reflections, and ethics (1996). In the teaching profession, teachers are in constant interaction and need of "people skills". They interact with students, administrator, co-workers and parents on a daily basis. Intrapersonal deals with reflection, disposition and the ethics that the teacher holds. Collinson points out that these "attitudes, sensibilities, and beliefs affect how a person sees, acts, and indeed lives" (1996, p.6-7). These aspects are directly related to how a teacher teaches, the classroom environment, decisions the teacher makes, and the curriculum taught.

By implementing authentic pedagogy, academic press, and positive classroom climate a teacher can have the ability to affect both achievement and mathematical interest (Khourey-Bowers, 2005). It challenges students to question the material along with teaching important concepts and standards. Authentic pedagogy consists of the teacher's facilitation of high-level thinking and connections to the real world (Khourey-Bowers, 2005). Academic press consists of not only the teacher's expectations for the students and the classroom, but challenging work and other cognitive aspects. In 2002, Middleton and Midgely studied 512 middle school eighth graders concerning their mathematical achievement and attitudes. The study centered on the perception the students had of the academic press in the classroom. The study concluded that when the academic press was apparent in the classroom culture the students thought the teacher had high expectations for them (Khourey-Bowers, 2005).

**Climate**

Classroom climate plays a very important role in the level of interest a student has in mathematics. The climate of a school is influenced at the school, district, and community level. Keete and his colleagues analyzed three distinct aspects of school climate. Values and attitudes, organizational characteristics, and characteristic of groups and individuals that include community demographics, all play critical roles in developing not only the school environment, but classroom climate as well (Improving School Climate, 1988). On the other hand, student outcomes and teacher satisfaction further influence the climate within a classroom.

The interactions and relationships between and among teachers and students positively and negatively affect classroom climate. There are varying perceptions by students and teachers regarding classroom climate. A student's comfort level and behavior towards fellow classmates has been shown to correlate to student achievement. Since the school is a primary place where

students socialize, it is important to reflect upon the messages sent to the students (Arter, 1987). Classroom climate should be adapted to fit the varying needs of the class.

The teacher must build a sense of community and encourage respect by showing interest in his or her student's lives by creating an atmosphere that is conducive to learning and student growth (Jones & Jones, 2004). When teachers provide a positive classroom environment, students are more willing to explore ideas, ask questions, and challenge themselves. This helps lead students toward an appreciation for the subject area and motivation for academic achievement. This development of a safe atmosphere provides a place where students are willing to share their ideas, learn from their mistakes, and appreciate different perspectives.

An environment that encourages creativity, flexibility and meaningful learning experiences helps students make personal connections to the material they are studying. These personal connections create a climate that is inviting and safe, helping to ignite a student's curiosity and motivation of mathematics (Brophy, 1986). In order for this to occur, teachers need to promote mathematical exploration, reasoning, and understanding.

Teachers must carefully examine whether or not their curricular content and instructional methods are meaningfully engaging and at an appropriate level of difficulty. They must be active in establishing an environment with rules and values that encourage understanding. Students need to feel that an activity relates to them to elicit enthusiasm and motivation for the topic. If the teacher doesn't adequately model her enthusiasm for the topic, the students will demonstrate little interest themselves. A teacher must show that they value learning as "a rewarding self-actualizing activity that produces personal satisfaction and enriches your life" (Brophy, 1986, p. 23). The attitudes, perceptions, and beliefs of a teacher are constantly seen through his or her interactions with the students. Students will be able to pick up on the subtle

cues of a teacher. "Consciously or not, the teacher will be modeling attitudes and beliefs about the topic or assignment, and students will pick up on these cues. If teachers present topics with enthusiasm suggesting that they are interesting, important, or worthwhile, the students are likely to adopt this same attitude" (Brophy, 1986, p. 25).

Contrary to popular perception, mathematics is essential for everyone whether or not they intend to major in the subject or use it in their future endeavors. "How do we best help our students learn to 'think like mathematicians', when many of them do not enter college with such a personal goal?" (Allen, Borkovitz, Lesser, McDuffie & Smith, 2005, p. 7)

**Current Data**

The 2004 Rhode Island's state assessment results on the New Standards Reference Exam for 8th grade mathematics show relatively low percentages at proficiency or above. The percentage of 8th graders who were at proficiency or above are; 57 percent on skills, 28 percent on concepts and 33 percent on problem solving (National Center on Public Education and Social Policy, 2005). Looking at these numbers, one can clearly see that too many students are not reaching proficiency in mathematics. This shows that there needs to be improvements in teaching practices and student performance.

As seen above, much of my research focused on how teachers effect math interest in the middle school. This effect maybe correlated to student performance on the State Assessment for mathematics. According to the SALT Survey 2004-2005 Reports, middle school teachers statewide indicated their attitudes towards educational practices on a variety of different aspects within their classrooms. For each of these practices, teachers reported their level of agreement on a scale from 1, strongly disagree, to 5, strongly agree. At the middle school level, the reports show that teachers agree to strongly agree, on average, that small group instruction and standard

based instruction are essential practices to effective education for their students. In regards to heterogeneous grouping within their classrooms, teachers' rating of its being essential was not as strongly endorsed (National Center on Public Education and Social Policy, 2005).

When Middle School teachers were asked how many times authentic instruction occurs in their individual classrooms, they reported that it only happens several times a month on average. In order for our students to develop their own thinking skills and context for learning, teachers must be able to relate the content to their students' lives more than a few times a month. According to these teachers, critical thinking enhancement practices take place about monthly. Teacher stated the use of manipulatives and other hands-on learning activities, occurred several times a month on average in the classroom (National Center on Public Education and Social Policy, 2005).

Yet, when looking at teachers reports on how often these classroom practices are implemented there is a disparity between what they believe and what actually occurs within the classroom. Teachers reported that small group active instruction takes place as few as several times a month in their classroom, even though teachers agree that it is an essential practice to an effective education. With respect to instructional practice for heterogeneous/multi level groups, teachers reported that these practices take place a few times a month. Teachers conveyed that standard based practices occur several times a monthly in their classrooms, when in reality it should occur daily. If teachers believe that standard based practices are an important part of the classroom, then why doesn't it occur all the time? The disparities between what the teachers think and what actually occurs plays a critical role in what the students learn and believe (National Center on Public Education and Social Policy, 2005).

. According to Infoworks 2004-2005 academic year, students in the middle school reported on their academic expectations. When students were asked whether or not they believe their teacher thinks that they would make the honor roll next year, a mere 48 percent said that they probably do (National Center on Public Education and Social Policy, 2005). This perception of low expectations by their teachers plays a critical role in their interest regarding mathematics and their performance on mathematical assessments.

When students were asked about their school climate, students rated it at "sometimes" positive. The students also thought that teachers only "sometimes" provided support. The teachers stated that they neither agree nor disagree that there is a positive classroom climate where they teach, agreeing with the students' views. Climate is a key factor in how the student learns and his or her interest in that subject. Since 1998, the data has relatively stayed the same regarding classroom climate (National Center on Public Education and Social Policy, 2005). If we know this, then why aren't we making changes to enhance the positive climate within our classrooms?

When students were asked about their self-academic expectations, the students in the 6th, 7th, and 8th grade placed themselves at the intermediate level. When students were asked what they felt their teachers expectations of them were, it was lower than what the students thought of themselves (National Center on Public Education and Social Policy, 2005). Although the numbers were still in the intermediate level and the difference was slight, the results are still surprising. If our students feel that their teachers don't believe in them, then why would they believe in themselves? The Rhode Island Department of Education states in the Mathematical Power for ALL students: The Rhode Island Mathematics Framework K-12 that, "all students must have confidence in their ability to do mathematics and believe that they can succeed in

learning and applying mathematical skills and concepts to everyday and work-related situations" (Rhode Island Department of Elementary and Secondary Education, n.d.). One way to revive students' interest is through hands-on activities and authentic learning. If a student sees a purpose to the content they will be more motivated to learn. Small group instruction, heterogeneous grouping, standard based practices and other strategies play a crucial role in a teacher's classroom. Based on the low performance of Rhode Island middle school students on their state assessment for math, more of these practices need to take place in the classroom. It is the teacher's responsibility to make sure they do.

**Summary**

Although, "research cannot and does not identify the right or best way to teach… a combination of research-suggested instructional practices and professional judgment and experience is most likely to produce [high student achievement]" (Grouws & Cebulla, 2000, p. 31). Teachers need to adapt to each student's learning needs. A teacher who is not only knowledgeable of their content area, but of different teaching strategies and aspects of students learning will be better prepared to deal and adapt with different diversities. A teacher's expectations and attitudes have a great impact positively and negatively on their students' interest in mathematics. It is also the responsibility of the teacher to provide a positive and safe climate within the classroom. Looking at the data in the Rhode Island Staff Reports on the SALT Survey of teacher's expectations, they reported that they believe in current research and teaching strategies, but aren't acting on their beliefs. Although student proficiency on state mathematics assessments are not relatively high, the Rhode Island Staff Reports and Student Report prove that there hasn't been a dramatic change in any of the different aspects of classroom practices that are effective within the classroom. "We must model what it means to

take responsibility for our society by developing a framework for mathematics teaching and learning that provides the citizens, educators, and students of Rhode Island with a clear vision of the mathematics students will need in the 21st century. We cannot be content with providing our students with the same mathematics education we received" (Rhode Island Department of Elementary and Secondary Education, n.d.).

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