



## Building Positive Teacher-student Relationships for Success in Mathematics: A Math Teacher's Reflection

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### Abstract

Creating an atmosphere that promotes warmth, structure, autonomy, and support from a systems perspective helps students to take action to reach their goals. Thus, it is necessary to build relationships with the class as a whole and individual students. This reflection of an eight-year mathematics teaching experience highlights the journey in teaching and shares three stories that demonstrated success in mathematics that can be achieved by building positive teacher-student relationships. It was concluded that it is important to foster positive teacher-student relationships to engage students and have them maximize their potential to reach their learning goals.

**Keywords:** Teacher-student relationship, success in mathematics, case study, motivational storytelling, Jamaica

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### Reflection

I did not always want to be a mathematics teacher. I saw myself in the field of Chemistry as a Cosmetic Chemist. However, that notion changed as my grades shifted and my passion started to show more and more for mathematics and teaching it. I was naturally good with mathematics and even better at teaching it to classmates, friends, and family. It was 2010, when I had to make a choice for college after what I call a pre-mature or false start to pursue natural sciences from 2008 to 2009, immediately after

completing 7 years of high school and a one-year break from 2009 to 2010, re-evaluating my next move. Two of my aunts, who are teachers, one specializing in Biology and Chemistry and the other in Information Technology, encouraged me to apply for teachers' college. They saw my talent, drive, patience, and love for teaching others, as well as how easily I can form relationships. They said all these traits were necessary for the teaching profession. With their words of encouragement, support from all my family members, and my self-evaluation, I applied. In the summer of July 2010, one of my aunts gave me somewhat of an internship with one of the Summer Teaching programs that she coordinated. Since my application to teachers' college was successful, she wanted me to be prepared for the career path ahead. She observed me for a week, after which she shared her thoughts, feedback, and tips. Thus, I began my teaching career in September 2010 as an undergraduate student at one of Jamaica's premier teacher-training institutions.

My teaching-learning experience so far has been one that is filled with fun and challenging but rewarding encounters. Upon entering the classroom as a secondary-level trained mathematics teacher in 2014, after completing my 4-year bachelor's degree program, my personal philosophy of mathematics teaching started to develop. Even personal thinking about what the mathematics teaching-learning experience should be like changed. With each group of students that I have taught, although they all had varying skill sets, mathematical affinity, and ability, one thing was still paramount or fundamental to the classroom experience – building relationships with the class as a whole and individual students. No matter the concerns, content, concepts, and students' understanding, I wanted all my students to be able to communicate their perspectives openly and respectfully. I believe forming an appropriate teacher-student relationship can allow this to happen. While completing the undergraduate program, I found myself evaluating and re-evaluating how I related to my teachers, classmates, and students when I did a series of teaching practicum exercises organized by the university. I noticed my disposition, and building rapport made the learning experience easier, which later translated to my teaching practice. The difficult and more abstract contents of Calculus 1, 2, and 3 were more tolerable as I could speak openly with the teacher and schoolmates. The lecturer created an atmosphere for this. I also wanted this for all my future students. Additionally, some foundational mathematics courses that focused on philosophies and methodology were heavily researcher-driven. After exploring concepts of knowledge extensively, I mentioned to the lecturer that I enjoyed this research assignment and that I could see myself going all the way in mathematics, even to be a researcher. I stayed true to the aspiration to the next level, graduate studies, but at another institution.

I continued with the same mentality as an undergraduate, building and maintaining appropriate relationships with each lecturer. I made use of consultation sessions and even had one of my lecturers dancing to Chi Ching Ching's song "Roast or Fry (Breadfruit)", in a curriculum class presentation that I shared on the topic of Classroom Disposition. I am where I am today, a doctoral student PhD candidate, because of positive relationships formed. The successes achieved then to now wanting to contribute on a grander scale to a career I initially did not want to be a part of were all because of positive relations and doing the personal work necessary to make my goals a reality. Therefore, this reflection seeks to demonstrate how building healthy, positive teacher-student relationships was paramount to my students' learning and subsequent success in mathematics.

Three main domains are critical to the teaching and learning phenomenon: cognitive, psychomotor, and affective (Bloom et al., 1956). When designing and executing lessons, all domains are to be engaged as best as possible. However, within the classroom, according to Bloom et al. (1956), it is in the cognitive domain that most of the work takes place in developing a lesson and, by extension, the curriculum. The psychomotor and affective domains that facilitate physical movement and emotions are incorporated as writing exercises and group activities that were perhaps not given as much thought as the cognitive domain when planning the lesson. In the development of the domains, Bloom et al. (1956) defined the cognitive domain as the aspect of learning that deals with the recall or recognition of knowledge and the creation of intellectual abilities and skills. The psychomotor domain is the use of physical skills, coordination, and manipulation to learn (Simpson, 1966). The affective domain, as espoused in Krathwohl and colleagues' 1965 work, is characterized by how things are dealt with emotionally (Learning Taxonomy, n.d). Research in recent years has started to examine in greater depth the affective domain and the social aspects of learning students' success (Hannula, 2019; Leder & Forgasz, 2006). Unconsciously, since my official entry into the teaching profession, my philosophy has been "to make the teaching and learning of mathematics a fun experience by making math come alive in the classroom." While this still serves as my general aim, the psychology behind it now is through the formation of healthy classroom interactions and relationships. Some would call this teaching math through the affective domain. The classroom has three main interactions: teacher and student, student and student, and student with content/concept. This paper explores my teacher-student interaction, the formation of positive, healthy, quality relationships, and the impact and successes achieved in mathematics by this aspect of my teaching practice.

Pianta et al. (2012) commented that the classroom operates based on interactions between and among participants. The level of interaction is the demonstration of the relationship that is established. Teacher-student interaction has been studied for decades. One popular tool to assess teacher interaction is the Questionnaire on Teacher Interaction (QTI) created by Professor Wubbels, which focused on the interpersonal behavior of the teacher as viewed and experienced by the student (Fisher et al., 1995; Lang et al., 2005; Sun et al., 2017). However, this reflective context examines my teacher-student interaction as a key component to the quality relationship that has led to numerous successes of students in mathematics from 2014 to this present moment, especially with students who have been labeled as weak, problematic, diagnosed with dyslexia, and Attention Deficit Disorder (ADD)/ Attention Deficit Hyperactivity Disorder (ADHD). With a love for research and psychology discovered and nurtured from the undergraduate level, I found that the relationships I have formed with students through the years can be better understood from a self-systems model of motivational development (SMMD). SMMD, according to Furrer (2014), assesses the needs that underlie student and teacher engagement and can offer an explanation for the dynamics that sustain positive or negative teacher-student and student-peer relationships in the classroom, exploring context, self, action, and outcome. This indirectly incorporates elements of the Achievement Goal Theory (AGT) and Self-Determination Theory (SDT). AGT, based on Anderman et al. (2020), is a framework used to explain and examine academic motivation evaluated by goal orientations of mastery (approach or avoidance) and performance (approach or avoidance). SDT, as posited by Deci and Ryan (2000), focuses on people's innate growth tendencies and inherent psychological needs on a continuum that are the bases for self-motivation and personality integration where social context and relatedness are integral. With respect to systems theory and success, Furrer et al. (2014) highlighted that those relationships in the classroom either worked or did not. The authors argued that teachers and students can tell when the classroom relationship is not working the best for them. Fisher et al. (1995), who expanded on the previous work of Wubbels, Creton, and Holvast 1988, also using a systems theory perspective, pointed out that teacher behavior is influenced by the student's behavior, which also influences student behavior. Mutuality is established, and a circular communication process is followed. Furrer (2014) further posited that warmth, relatedness, and competence felt by the student around the teacher build students' self-system. Establishing the tone and relationship of the class utilizes the notion of mastery, avoidance, and performance goal that leads to students' determination of what to retain for areas of intrinsic or extrinsic motivation.

A school's academic year in Jamaica is organized in three terms. Regulation 7 of the Education Regulations 1980: The First or Christmas Term (1<sup>st</sup> of September – 31<sup>st</sup> of December), Second or Easter Term (1<sup>st</sup> of January – 30<sup>th</sup> of April), and Third or Summer Term (1<sup>st</sup> of May – 31<sup>st</sup> of August) with exemptions for when the first Monday or school day falls on a public holiday (Regulation 7 – Education Regulations 1980). During this time frame, institutions have assessments for each grade, student, and in the respective subject area. The formative and summative assessments occur throughout the term and at the end of the term. At the end of the final term, Term 3, however, all the content taught throughout the year is tested. Moreover, at the end of five years, each student sits on a series of regional external exams through the Caribbean Examination Council (CXC) and other examination bodies specific to their courses or vocation, for example, City and Guild. From my experience, most of the classes I received were labeled as students with learning difficulties or behavioral challenges each year. Since my philosophy of the teaching-learning exercise of mathematics has become more refined, clearly defined rules were established with the assistance of the students to achieve and maintain the common goal of academic success in mathematics. The class sessions were organized in such a way that each student had at least five (5) minutes of personal contact time with me. Most sessions were either 35 or 45 minutes long. During this time, "finish-first" tasks would be given to the other students as the class session progressed; where additional teaching-learning support is needed, parents were consulted to give consent for these after-school sessions. Although teacher-parent and student-parent interaction was not considered here, when engaging in activities of this nature, not only is permission to be granted and all personnel be informed, but where additional details such as transportation and even just to have a snack, contact with parents are important. I also wanted the parents' support in helping their child or ward to succeed.

Throughout my eight years of teaching, prior to taking a break to study full-time, there were about six students whose educational background had been riddled with bad experiences (learning or academic), as well as just social and home-life situations. Of these six students, three cases stand out, forever etched in my mind. These cases show a rise to success from behavioral issues, hating math to pursuing a degree heavily hinged on mathematics, and from a learning challenge to being recommended to sit the external exam for mathematics one year earlier. All this came from what was built in the classroom: a positive, healthy relationship, through open communication, between me, the student, and parents/guardians. A point to note here is that I valued my time early in my teaching career and decided not to do "wholesale extra class." Teaching the same students after school just for

the sake of making up what they missed in class. Extra class, for me, was on a need basis, a need that I, as the teacher, saw; then, in dialogue with parents, a plan is developed to have their child or ward tap into their hidden potential in mathematics. Although I accept that not all students will ever like mathematics, I believe there ought to be some basic appreciation for the fundamentals of mathematics and what it looks like in and out of the classroom, the school environment, and beyond  $x$  and  $y$  in algebra. The foundation of which, for me, began with creating an atmosphere that was welcoming and accommodating to students' curiosity without disrespect. I allowed each student to feel the warmth and trust with each encounter as being meaningful, not just for the moment but long-term. Furrer et al. (2014) talked about how teacher and peer relationships influenced students' classroom engagement and resilience. Especially in providing a context of warmth as opposed to rejection, students would see the teacher as a dependable source of both emotional and instrumental support, and they would feel connected to their teacher (Furrer et al., 2014). This further indicates whether the students will engage in the lesson or be disaffected to negatively affect their learning and achievement. Furrer et al. (2014) elaborated on context as warmth vs. rejection, structure vs. chaos, autonomy support vs coercion when it came to the students' relationships with their teachers.

The cases shared next highlight the outcome of success in mathematics, which I believe came from building positive teacher-student relationships. In recalling each case, I have referred to these students as Sarah, Lenny, and David.

### **Case 1 - Sarah**

I met Sarah when I just left college and started teaching at the school she attended. I was assigned to be her grade 9 class mathematics teacher. This Grade 9 class had approximately forty-nine students. Like any other class with teenagers, these students had their fair share of challenges; now, with a new teacher, how will they manage and achieve their respective goals? Sarah usually sits at the front of the class, very attentive, quiet, eager to learn, and always has a question. Over Term 1, she performed exceptionally well. At the beginning of the second term, the school had scheduled a parent-teacher consultation for all year groups. Sarah's mother, who did not live in Jamaica at the time, made arrangements to be at the consultation. In all openness, I told her that she did not need to speak with me because her daughter was doing well. I also shared with her that if her daughter continued, she will be able to pass the external mathematics exam and do so with a high score of Grade 1 or 2. Sarah's mother had expressed that she wished to speak with me some more; however, due to the fact that there were other parents in line, we simply exchanged contact. After one week, the mother shared

with me that there were some behavioral challenges with Sarah at home. The disrespect she would receive from Sarah was bad. Sarah's mother asked me, as the teacher, to speak with her daughter because, in her opinion, her daughter has a good relationship with me, and she talked about our classes a lot. She thought that if I could speak with her, things at home may change. Initially, I was shocked at the request. However, I made some consultations on how to approach the situation. Outside of regular teaching sessions, I would meet with her at least twice per month; after getting initial cordial greetings and formalities, we would talk about school, assignments, and then home-life. Initially, there was some hesitation for her to share, but I hinted that her mom was concerned about her behavior, tone, sense of responsibility, and romantic relations with the opposite sex. I was very honest with her in sharing the concerns of her mother. I allowed her to share her views on the matter; we discussed them and looked at possible solutions. As home life improved, she wanted to still meet. I was okay with that as my schedule allowed it. Her mother also saw the change. From these monthly discussions, it was discovered that she wanted to enter a career in logistics management. Sarah's grades continued to improve. She even added that she was enjoying maths now and doing better in mathematics than all her other subjects. Since I was still new to teaching, I asked the other subject teachers about her and her academic abilities. They shared that she was not doing well in their subject areas and that she was feisty. I did not receive any feisty behavior from Sarah, nor were her grades low. She was one of the top students. In our regular chats, I asked about her other subjects, and in true teenager fashion, she did not like the teachers or the subject. I encouraged her to shift their mindset, looking at the bigger picture, the end goal. Subsequently, I would periodically check her progress and behavior in her other subject areas. A total turnaround was in motion.

At the end of the academic, she was successful in her subject selections for grade 10; however, I was no longer her teacher. She started to come to me to complain. I did not encourage that behavior. On the other hand, I encouraged her to ask questions as she did with me and practice, practice, practice. Realizing her abilities in mathematics from Grade 9, she wanted to sit the external examination for mathematics at Grade 10. With her mom's approval, we started mathematics classes on Sundays to prepare her to sit the external exam in mathematics. This exam is usually done at the end of Grade 11. Her complaints about her new class teacher changed as her mindset shifted. In addition to working on mathematics past papers, words of encouragement were always shared. We worked together for the entire year. She also used her initiative to engage in practicing questions on her own. We talked about mathematics testing skills and how to evaluate questions to maximize exam marks. She welcomed

and appreciated my effort with her. Her mother commented once again on the change that she saw. While there will always be room to do better, there were improvements in what her initial home life was. At the end of Grade 10, Sarah was successful in the sitting of her CXC mathematics external examination. She was determined and dedicated. Although I was new to teaching and developing my own style, I was able to create an environment and relationship for her to grow and attain success.

### **Case 2 - Lenny**

Lenny, who at the time may have been 13 or 14 years old, behaved older and more mature than the average 13- or 14-year-old. I was assigned to Lenny's class when he was in grade 8. He did not like mathematics because of past experiences (low scores, boring classes, and teachers did not understand him). By this time, I was in my 4<sup>th</sup> year of teaching and fully into honing my craft of building positive relationships, establishing mutual respect, and classroom management skills that lead to effective teaching-learning sessions. A general question I started to ask during the first week of meeting each new group was, "Do you like mathematics?" or "How would you rate your mathematical abilities?" No matter the answers given, we would further discuss them as a class and establish rules for class, learning outcomes, behaviors, and accountability. We discussed what was needed for their success. Lenny, who behaves older than his years, was very vocal but respectful about how he felt about mathematics. The class session was very vibrant. While he did not have behavioral programs, he honestly just did not like mathematics. After days, weeks, months, and a full academic year, he warmed up to mathematics. His performance improved. He and his classmates were excited to be in class, to the point where he said that his mom would like to know which teacher they had for mathematics that could get a group of boys excited for class. The students expressed very often that mathematics came alive in class based on how I related to them, I even found myself eager for their class time. Lenny continued to be vocal, sharing his ideas, helping his classmates, and developing a deeper appreciation of mathematics. Other than supporting Lenny's vocal personality, upon the request of one of his parents, I also tutored him occasionally on any topic in mathematics that was challenging. Five and half years later, the initially non-existent passion has morphed into a pursuit of a career in computer science, which has multiple applied mathematics courses. The rapport that was built allowed him to feel comfortable; that sense of relatedness allowed him a channel to engage, not only in class and with mathematics but with the overall learning process, to see the possibilities in the field of mathematics.

### **Case 3 - David**

David was a transfer student in the second term of Grade 7 at the height of the pandemic. All teaching was completely online. During the month of January, the school usually administers internal assessments for the previous term. Although he was new to the institution, this test would serve as a diagnostic one for him to see his level of understanding based on his computation skills and how he applied his knowledge to questions requiring critical and higher thinking skills. While the test covered what one would say are basic, foundational mathematical concepts, his performance was poor. Subsequently, when the results were published, I wanted to reach out to a parent or guardian; however, I received communication from one of his parents first. It was at that moment it was shared with me that David had been previously diagnosed with dyslexia, and from further psychometric evaluation, it was found he would have difficulties following tasks and expressing his ideas in a clear, structured, step-by-step manner. After more discussions with one of his parents, we arranged for him to do additional lessons to help him create structures on how to translate his thinking into meaningful mathematical expressions of the topic being taught. This discussion opened my eyes to the world of dyslexia and how it can affect students in all areas of academia. Then David and I worked through the test that was previously done. David was different and eager to rise above his diagnosis. It did not take long for him to start approaching questions differently. He was no longer the quiet young man in class. He was an active participant in the class. He was never afraid to ask questions. His classmates were happy when they were grouped together with him.

Online sessions with David continued until he reached grade 10. By this time, I was no longer at his institution. However, due to the progress he has been making, his mom has asked me to continue with him. I worked with him online for two and a half years. His grades improved so significantly that he was placed in an accelerated math program at his school when he started grade 9. Furthermore, like Sarah, he also did the math external examination in grade 10. He was successful. His zeal, communication, and relatedness taught him how to structure and represent his ideas. Our classroom context and interaction encouraged this, even though these sessions were online. He developed resilience, as Furrer (2014) calls it. Our dialogues boosted their confidence and made them feel comfortable asking questions, seeking clarity, and, most importantly, succeeding. Whenever we had classes, he would share that he wanted to pursue a career in mathematics. He has gone from not being able to express his mathematical thinking to wanting a career in mathematics. It was a tremendous pleasure teaching him; if I had not been told that he had dyslexia, I would not have known. He is a brilliant young man who will achieve all his endeavors.

## Concluding remark

In closing, creating an atmosphere that promoted warmth, structure, and autonomy support (from a systems perspective) helped students take action to reach their full potential. I will continue to help each child I teach by fostering these components in building positive, healthy relationships that will make the students feel competent, develop autonomy, have a sense of relatedness to thus being engaged, and cope in the classroom and with the learning activities. Success in mathematics is possible, and from my years of experience so far, along with the works of researchers like Fisher, Furrer, Sun, and Lang, it starts with building a positive teacher-student relationship that works.

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