

Evaluating Mathematics Teaching Through the Lens of Some Grade 4 Students

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Abstract

This research sought students' evaluation of their teachers' teaching of mathematics. Eight hundred and ninety-nine Grade 4 students from 15 schools in two parishes were purposively and conveniently selected to participate in the survey. Their perspectives were sought on six indicators of teaching: Personal Attributes of the teacher; Planning and Preparation; Teaching Methods; Classroom Learning Environment; Classroom Management and Control; and Assessment and Feedback.

The students had positive perspectives for all six indicators; however, they scored the teachers lowest in the areas of *Teaching Methods* and *Assessment and Feedback*, and highest on *Personal Attributes* and *Classroom Management and Control*. As direct 'clients' in the classrooms, student's evaluation can provide useful data for reflections, and areas to consider for improving instructional practices.

Keywords: Evaluation; Classroom practices; Indicator of teaching; Perspective

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1 Introduction

Students are key stakeholders in the mathematics classrooms, yet limited opportunities are provided for them to voice their experiences in their learning of the subject, and to state their opinions on the school's structure and administration. Most schools are not organized in ways that encourage students to assess their teachers' teaching of subject matters. The common characteristic of classroom practices is for the teachers to ask questions to elicit students' understanding of the curricular content through verbal or written responses. Dewey (1933) called for teachers to listen to students and to be aware of their thinking, affect and learning. Even though this reference is somewhat dated, the situation still exists in contemporary educational systems. Educators rarely seek students' opinions on curricular content, curriculum implementation, and strategies that teachers and the administration can employ to help students learn. They are of the view that students learn from them, and do not consider that they can learn from students. According to Darling-Hammond and Bransford (2005), understanding students' perspectives within the cultural and social context in and out of school is critical for effective teaching and learning.

2 Rationale for the study

Mathematics is a subject that consists of many abstract ideas. The low percentage passes in mathematics among students at all levels of the educational system, both nationally and internationally, suggest that more is needed by the system to improve performance in this subject area. According to Rudder and Flutter (2004, as cited by Greer & Sweeney, 2012), increasing student voice has been found to improve student learning especially when student voice is linked to changing curriculum and instruction.

Ernest (1989) explained that teachers hold different views of the nature of mathematics, mathematics teaching and mathematics learning, hence, their classroom practices generally reflect the views that they hold. In other words, teachers' conceptions and their belief systems influence their teaching, and these perceptions are important in measuring teaching effectiveness.

The literature on teachers' beliefs and the impact of them on their practices is widely documented (Kagan, 1992; Pajares, 1992). Despite this, there are gaps in the research literature on students' perceptions of their teachers' teaching of mathematics. Although there may be persons who are skeptical that students are not emotionally mature and responsible to appropriately evaluate their teachers' practices, Ahmed and Aziz (2009) think otherwise. They are of the view that collecting data from students regarding their teachers' teaching provides meaningful data on what the teachers do in their classrooms. They stated further that students are generally objective in their opinions, and as students, they are able to observe learning and teaching behaviours more intimately than other stakeholders. Ahmed and Aziz (2009) also found out that students develop conceptual understanding of the concept presented when they perceive their teachers' classroom environment as cooperative rather than competitive. In describing students perception regarding their mathematics teachers' teaching, Rawnsley (1997) established that students develop a more positive attitude toward their mathematics lessons when the teacher is considered to be highly supportive and gives the students the chance to play an integral role in the teaching-learning process.

The experiences for students are influenced by the level of lesson planning and preparation that the teachers engage in, the classroom learning environments that they create, the teaching methodologies that they use, the level of classroom management and control that they display, the personalities that they reflect, and the assessment and feedback tools that they employ. These six indicator variables that are

specific to the teachers influence the teachers' classroom practices (Hattie, 2003; Johnston-Wilder, Johnston-Wilder, Pimm & Westwell, 2005; Kyriacou, 2009). However, in the Jamaican (primary) classrooms, although the students are valued by their teachers, their (the students') opinions are not sought, whether formally or informally, on these significant areas of their teachers' classroom practices for teaching mathematics. It is in this regard that this study sought to explore the perceptions of Grade 4 students on the quality of their teachers' teaching of mathematics in six areas: Personal Attributes; Lesson Planning and Preparation; Teaching Methodologies; Classroom Learning Environment; Classroom Management and Control; and Assessment and Feedback.

3 Research questions

The main question that this study sought to address is:

How do students perceive their teachers' teaching of primary mathematics?

This was addressed by responses to the sub-question:

What are the Grade 4 students' opinions on the quality of their teachers' teaching of mathematics, based on six indicators of teaching: Personal attributes; Planning and Preparation; Methodologies; Classroom Learning Environment; Classroom Management and Control; Assessment and Feedback?

4 Significance of the study

The findings from the quantitative approach indicate the opinions that the teachers in the sample hold about their own teaching of Grade 4 mathematics with regards to given criteria. In addition, the opinions of their students about their classroom experiences provided by their teachers, with regards to the same criteria, shed some light on differences between the two sets of opinions. Such analyses should be beneficial in providing data about students' experiences in the mathematics classroom. Mathematics is a subject that many students fear and perform poorly in. The Jamaican Ministry of Education and significant stakeholders may wish to consider possible actions to take to revise policy and to remedy any inappropriate practices in the mathematics classroom in a climate that stresses reform practices to enhance student learning of the subject.

The findings will add globally to the existing literature and contribute to meaningful debates and discussions about primary mathematics education globally, and the role of evaluation by significant stakeholders including students, in contemporary mathematics education. They will also inform my own practices as a teacher educator and provide greater clarity on the evidence regarding teacher quality, teaching quality and classroom practices on student achievement in mathematics at the primary school and more so at the Grade 4 level.

5 Key terms

Classroom practices: The environment for learning that the teachers create that are characterised by their styles, whether authoritative or non-authoritative; the teaching strategies or approaches that are used; the assessment tools that are selected and used; the discerning qualities that are demonstrated; the rules and regulations that are explicitly or implicitly implied by the teachers' actions; the interest (or lack thereof) for the students and responsiveness to them; and the passion, poise, enthusiasm (or lack thereof) for teaching that are demonstrated (Kyriacou, 2009). Overall, classroom practices are the thoughts and actions of teachers within the contexts of the classrooms, which manifest from the teachers' knowledge, values, beliefs and attitudes.

6 Review of related literature

This study is grounded in the theoretical framework of the constructivist learning theory as it involves the voices or perspectives that the students form of their experiences in the mathematics classrooms generally, and from their mathematics teachers' strategies for teaching mathematics specifically.

Constructivist learning theory is built on the premise that students actively construct their knowledge and understandings by assimilating new experiences into what they already know whether by independent means (Piaget, 1974) or through social interactions within cultural settings (Vygotsky, 1978).

According to Kincheloe (2005), students' experiences within social and cultural contexts shape their abilities for learning and have implications for instructional practices. The extensive work by Cook-Sather (2006), with the Teaching and Learning Together (TLT) project (2006) with pre-service teachers, recognizes that students are knowledgeable on issues of teaching and learning, and so opportunities should be provided for them (the students) to state their perspectives on their experiences in the classrooms.

The TLT project fostered the development of teachers who learned to speak and act by first learning to listen to students, and then in turn develop a commitment to eliciting and responding to students' perspectives as an integral part of their approach to teaching (Cook-Sather, 2006, p. 347).

Cook-Sather (2006), underscored the many benefits that can be derived through the effective use of students' perspectives on their teachers' teaching. She opined that the perspectives create a scenario for critical reflection which has the potential to transform education in ways that could benefit all concerned.

7 Methodologies

I conducted a quantitative questionnaire survey to collect data on a wider-scale, relating to evaluating teachers' classroom practices for teaching Grade 4 mathematics. Perspectives were sought from the students of primary teachers.

7.1 Gaining Entry

Before I visited the 16 primary schools in two parishes, I sought permission from the Principals or Vice-Principals through telephone calls or visits to the schools to conduct the survey at their schools. These schools were purposively and conveniently selected.

7.2 Participants

For the survey, 899 Grade 4 students of 37 teachers from 15 schools in two parishes completed and returned the students' questionnaire. These 9- and 10-year old boys and girls attended Government coeducational primary schools and twenty of them attended a private coeducational Preparatory school.

For this data-collection process, at four schools and in 12 classes, all the students in each class completed the students' questionnaire. In the other schools and classes, I carried out random sampling of approximately 20 students per class; I distributed the questionnaire to the students who wanted to participate and raised their hands.

8 Pilot study

The Cronbach alpha value of 0.64 was obtained for the reliability of the questionnaires on the pilot testing. The alpha value of 0.64 that was obtained for this research would suggest that the instrument was moderately reliable (Gay & Airasian, 2000). The questionnaires for this research were thus regarded as having a moderate internal consistency and as such, the questionnaires just measured the six categories or dimensions of teaching.

9 Instruments

The students' questionnaire sought the responses from the participants on the teachers' classroom practices for teaching Grade 4 mathematics. The questionnaire was adapted from a research by Ingvarson, Beavis, Bishop, Peck and Elsworth (2004) that investigated effective mathematics teaching in Australia.

The students' questionnaire was made up of 30 items each with a three-point Likert scale: Yes, Not sure, No. The items required the students to rate their teachers for the teaching of Grade 4 mathematics in six categories: *personal attributes, lesson planning and preparation, teaching methods, classroom learning environment, classroom management and control, and feedback and assessment*. For each category, there were positive and negative statements that were similar to the items of section B on the teachers' questionnaire.

10 Validity, reliability and bias

For the quantitative approach, I tried to ensure validity and reliability by selecting appropriate categories (variables/constructs/subscales), and by carefully designing and selecting the items under the categories for the questionnaires. I chose to have more items about teaching methods because I considered this category to be the main area of teachers' instructional practices. The numerical values that were assigned to the ratings for the items on the questionnaires were carefully considered and applied. Appropriate statistical analyses were carried out and generalisations were made where applicable. Overall, I tried to observe all the necessary protocols for quality with respect to data collection, analyses and interpretations.

11 Main study

I collected the quantitative data over one month at 15 schools within two parishes. At each school and in each class, I read the items to the students and rephrased the statements in some instances in order to facilitate the students' understanding of the items and to have them complete the questionnaire at the same time. One thousand and thirty-one questionnaires were handed out but only 899 of them were properly completed by the students.

12 Data Analyses

I manually scored the responses for each group of respondents. For each category of items on the students' questionnaire there were equal numbers of positive and negative statements. For the positive statements, the scorings for the selections of strongly agree, agree, undecided, disagree and strongly disagree were 5, 4, 3, 2 and 1 respectively. The reverse coding was done for the negative statements.

The scores obtained were then analysed using the Statistical Package for the Social Sciences (SPSS 16.0) programme. This software programme was used to (i) compute the mean score of the students' responses in each of the six categories; (ii) analyze the data to give the descriptive statistics for the means and standard deviations for the students' responses in each of the six categories; (iii) compute the percentage frequencies of the positive responses for the 30 items on the students' questionnaire; and (iv) rank the students' positive responses in (iii) above from the most positive to the least positive .

I examined the outputs of these measures from the SPSS (16.0) programme for the comparison of means and standard deviations among the six indicators of teaching for each set of data, and to determine the percentages of the respondents who selected positive responses for each of the 30 items on the questionnaires. In determining positive responses, the rating of 3 on the students' questionnaire was used. Different levels of opinions were assigned to the mean scores for each category of items on both the teachers' questionnaire and the students' questionnaire as shown in Table 1.

In arriving at the levels of opinions, values above the mid-point of the maximum score were considered positive, and those below the mid-point of the maximum score were considered negative. Hence, for the students, less than 1.5 indicated negative.

13 Results

The means and standard deviations for the students' responses on the six indicators of teaching are shown in Table 2. From Table 2, it is noted that the students had positive opinions on all six indicators of teaching, as the mean values are all greater than 1.5, the mid-point of the highest possible score. The students scored the teachers the lowest in two areas: *Teaching Method* (M=2.06; SD= 0.31) and *Assessment and Feedback* (M=2.11; SD= 0.39). The highest scores were given for *Personal Attributes* (M=2.47; SD=0.50) and *Classroom Management and Control* (M=2.61; SD= 0.41). The scores for *Planning and Preparation* and *Classroom Learning Environment* were respectively M=2.41; SD=0.44 and M=2.20; SD= 0.52.

Further analyses of the students' responses on the items within each teaching indicator or sub-scale were carried out. The results are as follows:

13.1 Students' perception on their teachers' Personal Attributes

Set against the level of opinions in Table 2, the overall mean score of 2.47 with a standard deviation of 0.50 for the indicator of Teachers' Personal Attributes suggest that the rating was between moderately positive (1.97) and highly positive (2.97). In spite of the differences in opinion in the education community about quality, teaching quality and teacher quality, a few studies have been conducted to explore the relationship between teacher quality and student achievement. Darling-Hammond's (2000) research study on teacher quality and student achievement indicated that the quality of teachers was related to the improvements in student performance in the subject. In exploring the issue of teacher quality on student achievement, Darling-Hammond (2000) examined six areas of teacher quality, namely: general academic ability and intelligence, subject matter knowledge, knowledge of teaching and learning, teaching experience, teacher behaviours and practices and differences in state policies regarding teaching. The quantitative analyses of her study indicated that all these measures had an impact on student achievement. However, teacher qualifications in terms of subject matter knowledge and knowledge of teaching and learning were the strongest correlates of student achievement in mathematics.

For this indicator, four areas of teacher characteristics were explored: attentiveness; caring; willingness to listen; and showing interest in students. The results are shown in Table 3. It is noted that an average of sixty-three percent of the students indicated that their teachers were willing to listen to them, cared about them and showed interest in them during the mathematics classes. Only 59% indicated that their teachers were never too busy to attend to them.

13.2 Students' perceptions on their teachers' Planning and Preparation

For this category, the students' responses were highly positive with an overall mean of 2.41 and a standard deviation of 0.44. The literature emphasizes the need for teachers to plan and prepare for their student's learning of the subject. Planning provides a platform for the teachers to consider the characteristics of their students and to organize the means for facilitating learning. According to Tanner and Jones (2000) preparing a plan helps to clarify the objectives of a lesson and the strategies, tasks and activities for achieving those objectives for students with diverse needs, abilities, interests and competencies.

The items on *Planning and Preparation* that the students responded to are shown in Table 4. The percentage of students with positive responses on the items within the category of *Planning and Preparation* ranged between 45% and 77%. Only 45% of the students viewed their teachers as being sure of

what they wanted their students to do during the mathematics classes, and 77% indicated that their teachers always had all the things ready for the mathematics classes.

13.3 Students' opinions on their teachers' teaching methods

The overall response from the students in this category of *Teaching Methods* was only moderately positive with a mean of 2.06 and standard deviation of 0.31. Research findings indicate that effective teaching methods actively engage the students in tasks and activities that cater to their learning styles and multiple intelligences through the use of different strategies and forms of classroom organization such as: whole-class, collaborative group work or individual work (Tanner & Jones, 2000). An item analysis of the responses in this category is given in Table 5.

The percentages of students with positive responses on the items within the category of *Teaching Methods* varied between 22% and 83%. Overall, the percentages of students' positive responses in this category were low. Of the ten items, only one score was in the eighties, four in the fifties and the others below 50. The percentage frequency of positive opinions for item 5 was 83%. This indicated that the majority of the students in the sample agreed that their teachers allowed them to think for themselves in the mathematics classes. Item 22, with the lowest percentage frequency of positive opinions of 22%, indicated that few students in the survey were of the opinion that their teachers did not give them similar work to do that they (the teachers) showed them on the chalkboard. Items 1 and 24 with percentage frequencies of 24% indicated that few students opined that their teachers used different strategies to teach them mathematics, and allowed them to do mathematics with their classmates.

The overall mean score for the students' responses to the items on teaching methods was relatively low (2.06) but nonetheless positive. Even though some of the students indicated the teachers' use of manipulative materials such as fraction tiles, bottle caps and marbles for the teaching of some mathematical topics such as addition, subtraction and multiplication, the students also indicated that most times, the teachers did examples on the chalkboards and gave them similar ones to do at their seats.

13.4 Students' opinions on their teachers' classroom learning environment

The scores that the students assigned in this category have a mean of 2.20 and a standard deviation of 0.52. The relatively high standard deviation from the mean suggests that the range of opinions varied between a low 1.68 (slightly positive) to a high of 2.72 (high positive).

Classroom environments that are conducive to learning are thought to be critical for effective teaching and learning. In this kind of non-threatening environment acceptable behaviours are established, and the students are made to feel special in how they are treated by the teacher and their classmates (Kyriacou, 2009). In this kind of environment, the making of errors is considered a natural part of the learning process.

Table 6 shows the percentages of students with positive responses in the category of classroom learning environment. The values varied between 34% and 61%.

For this category of *Classroom Learning Environment*, only 34% of the students agreed that their teachers made them feel that it was OK to make mistakes in the mathematics classrooms. Sixty-one percent of the students felt free to ask questions during the mathematics classes, and 56% opined that their teachers did not get angry when they made mistakes doing the mathematics. Only 54% of the students indicated that their teachers allowed them to ask questions during mathematics classes.

13.5 Students' opinions on their teachers' classroom management and control

It is well known that chaos in any classroom setting does not promote effective teaching and learning. Although most schools have established policies and practices, the onus is on the teacher to

develop a shared understanding with the students of the expected standards and behaviours, and to inform them of the consequences for misbehaving or breaking any of the established rules.

The mean and standard deviation of the percentages of students with positive responses for the items in the category of *Classroom Management and Control* are respectively 2.61 and 0.41. These translate to values between moderately positive and high positive perspectives, according to level of demarcation that was established. The percentages of positive responses are shown in Table 7.

The percentage frequencies in this category were high (seventies and eighties) for all the items except item 18. For this item, only 51% of the students were of the opinion that their teachers cared whether or not their students respected them in the mathematics classes. Eighty-one percent of the student-respondents opined that their teachers made sure that the students obeyed the rules and regulations in the mathematics classrooms. Additionally, 79% of the respondents indicated that their teachers demanded respect from their students and did not allow them to do as they like during the mathematic classes.

13.6 Students' opinions on their teachers' Assessment and Feedback

The scores of the students' responses in the category of *Assessment and Feedback* were moderately positive with a mean of 2.11 and standard deviation of 0.39. The main purpose of assessment is to determine what the students know and can do, and to provide feedback to the students on their areas of strengths and weaknesses. Assessment techniques can take different forms such as pen-and-paper tests, projects, portfolios, observations and interviews (Gallagher, 1993).

Table 8 shows that the percentages of students with positive responses on the items within this category varied between 15% and 61%. Only 15% of the students agreed that their teachers did **not** always give written tests to determine how much mathematics they knew. Forty-seven percent of the students thought that their teachers told them how they were doing in mathematics.

The findings suggest that collectively, the students' perceptions of the teachers' classroom practices for teaching mathematics ranged from moderately positive for *Teaching Methods*, *Classroom Learning Environment* and *Assessment and Feedback*, and highly positive for *Planning and Preparation*, *Personal Attributes* and *Classroom Management and Control*. However, there were some areas that received higher positive percentages than others.

14 Discussion

This research is significant in that very little is documented on students' evaluation of their teachers' teaching of mathematics. In an educational climate that promotes student-centered classroom settings in which students are allowed to engage freely in their learning of the subject matter with the teacher as facilitator, guide, listener and advisor, among other roles, the results of this study suggests that the students' perceptions of their teachers' qualities and instructional practices varied.

Despite the fact that the students' responses were all positive, the findings revealed that there is much room for improvement in all the six indicators of teaching that were explored. Eight hundred and ninety-nine students from 15 schools participated in the study. This means that the students' responses related to their 15 class teachers. Even though the number of participants may seem limited, the responses give insights on how students perceive their teachers' practices for teaching mathematics. Collectively, the percentages of positive responses were low for the teaching indicators.

For *Personal Attributes*, an average of 62% of the respondents opined that their teachers cared about them, attended to them, showed interest in them and were willing to listen to them. Kyriacou (2009) emphasized that there are three dimensions to learning: cognitive, social and emotional, and further suggested that teachers have a key role to play in facilitating all three areas for their students.

In the area of *Planning and Preparation*, the students indicated that less than 77% of their teachers were ready with the curricular materials for class, and were clear about what they expected their students to do in the classes. Effective lesson planning and preparation provides a structured framework for implementing the curricular content in a timely manner. This includes identifying the lesson objectives, the tasks and activities, and accessing the resources and the assessment tools.

The responses in the section on *Teaching Methods* had the widest variations in responses and the lowest positive opinions. It appeared that whole-class teaching of the expository method was the norm with all the students being required to do the same exercises. Examples were done on the chalkboard by the teacher which the students were required to replicate. Little use was made of manipulative materials (51%). Discourse among students and teacher, and use of a variety of teaching strategies were rarely noted by the students. In order to facilitate individual differences among students in the mathematics classroom, and to engage students in higher-level thinking through reasoning, communicating, making connections and problem-solving, it is recommended that varying teaching strategies are employed.

Only 34% of the respondents indicated that their teachers made it seem OK to make mistakes in the mathematics classes. The making of errors is usually considered as an integral part of the learning process. However, in this study errors were clearly not seen by the participants' teachers as a way of exploring students' thinking.

The responses in the area of *Classroom Learning Environment* suggest that the students were not made to feel at ease in the classes. They were hesitant to ask questions, to discuss among themselves and to explore mathematical ideas. The learning environments that teachers create are a function of the teachers' understanding on how best children learn (mathematics), and effective ways of communicating with them. According to Capel, Leask and Turner (2005), in communicating with pupils, the teacher should consider both verbal and non-verbal means of communication. These include voice, language, active listening, facial expressions and mannerisms.

The students in the sample gave high scores to their teachers' abilities to *Manage and Control* the classes. Those teachers ensured that the school rules and policies were followed and ensured that the students respected their teacher. Even though there are cultural differences among classrooms with students of diverse experiences, interests and needs, effective teaching and learning is dependent on a disciplined classroom in which students are listened to and their opinions are valued (Tanner & Jones, 2000).

The ratings in the sections on *Assessment and Feedback* were poor. A variety of assessment techniques was not employed by the teachers, and feedback on students' performances was not the common practice. The literature highly recommends that teachers vary the assessment techniques in order to cater to the varied learning styles and multiple intelligences of students in the mathematics classroom (Gallagher, 1993).

The Grade 4 students' evaluation of their teachers' teaching of mathematics indicated that there were some aspects of their practices that reflected student-centeredness and reform processes, and there were other areas that were characterized by traditional methodologies.

15 Conclusion

The perspectives that the students indicated in the study showcase areas to be reflected on by classroom teachers and other stakeholders in order to improve instructional practices for the teaching of mathematics. In other words, teachers' improved practices can be shaped by students' perspectives of their experiences in the mathematics classrooms.

Listening and responding to students perspectives can foster the development of students who are more attentive in classes, critically aware and involved in their learning.

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Tables

Table 1: Levels of opinions of teachers and students

Levels of opinions	Mean for students
Negative	<1.5
Slightly positive	1.5 – 1.7
Moderately positive	1.8 – 2.3
Highly positive	2.4 – 3.0

Table 2: Means and standard deviations for the scores on the students' questionnaire

Categories	n	Min	Max	Mean	SD
Planning and preparation	899	1.00	3.00	2.41	0.44
Teaching method	899	1.29	3.00	2.06	0.31
Classroom learning environment	898	1.00	3.00	2.20	0.52
Classroom management and control	899	1.00	3.00	2.61	0.41
Assessment and feedback	899	1.00	3.00	2.11	0.39
Personal attributes	891	1.00	3.00	2.47	0.50

Table 3: Percentages of students with positive opinions on their teachers' personal attributes

Category	Item	% of positive responses
Personal Attributes	14. is always too busy to attend to me.	59
	16 does not care about me in the mathematics class.	63
	23. is always willing to listen to me.	62
	25. shows interest in me in the mathematics class.	63

Table 4: Percentages of students with positive opinions on their teachers' planning and preparation

Category	Item	% of positive responses
Planning and preparation	2. does not have all the things ready for the mathematics classes.	51
	4. is not sure what she/he wants me to do during the mathematics classes.	45
	11. always has all the things ready for the mathematics classes.	77
	13. always plan all the activities for me to do during mathematics classes.	58

Table 5: Percentages of students with positive opinions on their teachers' teaching methods

Category	Item	% of positive responses
Teaching Methods	1. always use different ways such as games, songs, dance and poems to teach me mathematics.	24
	3. always allow me to work with my classmates to do mathematics in the mathematics class.	36
	5. always allow me to think for myself in the mathematics class.	83
	7. shows me how to use mathematics in school and out of school.	55
	9. uses things like fraction tiles, bottle caps and marbles to teach me mathematics.	51
	22. does work on the chalkboard and then give me the same kind of work to do at their desks.	22
	24. always allow me to do mathematics by myself in the mathematics class.	24
	26. does not allow me to think for myself in the mathematics class, but tells me the steps to take in doing mathematics.	33
	28. does not show me how to use mathematics in school and out of school.	51
	30. does not use things like fraction tiles, bottle caps and marbles to teach me mathematics..	50

Table 6: Percentages of students with positive opinions on the classroom learning environment that their teachers created

Category	Item	% of positive responses
Classroom learning environment	6. does not allow me to ask me questions during mathematics classes.	54
	8. gets angry with me in the class when I make mistakes doing mathematics.	56
	15. makes me feel free to ask questions during mathematics classes.	61
	17. always makes me feel that it is OK to make mistakes in class while doing mathematics.	34

Table 7: Percentages of students with positive opinions on classroom management and control

Category	Item	% of positive responses
Classroom management and control	18. does not care whether or not the students respect him/her in the mathematics class.	51
	20. always allows the students to do as they like during mathematics classes.	78
	27. makes sure that my students respect him or her in the mathematics class.	79
	29. makes sure that the students obey the rules and regulations of the mathematics classroom	81

Table 8: Percentages of students with positive opinions on assessment and feedback

	Item	% of positive responses
Assessment and Feedback	10. always gives me written tests to do to test me on how much mathematics I know.	15
	12. does not tell me how I am doing in mathematics.	47
	19. uses different ways such as projects and portfolios to test how much mathematics I know.	55
	21. tells me how they are doing in mathematics.	61