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STUDENTS' VIEWS OF MATHEMATICS: A SURVEY OF JUNIOR AND SENIOR HIGH SCHOOLS IN THE ASHANTI AND BRONG AHAFO REGIONS*

by

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ABSTRACT

This study investigated the views of students, their conceptions of mathematics, attitudes toward and habits of learning mathematics, and their perceived difficulty level of various mathematics topics in Ghana. A questionnaire survey was administered to a random sample of 800 junior high and senior high students in the Ashanti and Brong-Ahafo Regions. The data collected showed a clear picture of students' perception of mathematics learning with regard to categories of interest, preference for understanding, confidence and competence, textbooks, classroom learning and outside-class learning, and learning habits. It also depicted substantial trends of changing views and attitudes toward mathematics learning across grade levels. Students' responses to the Conception of Mathematics were consistent with previous studies, and demonstrated some specific characteristics of their views of mathematics. This survey has provided useful background information regarding students' needs and aspirations in mathematics learning for curriculum planners and frontline teachers in future curriculum reform and implementation.

Key words: attitudes towards mathematics, conceptions of mathematics, junior high school, perceptions of mathematics, senior high school, trends of students' attitudes

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1. INTRODUCTION AND PROBLEM STATEMENT

The policy of compulsory basic education has been implemented continuously for nearly 20 years in Ghana after its initial introduction in the first post-independence government of Dr. Kwame Nkrumah and the Convention People's Party (1957-1966). Despite the optimistic expectations in the 1990s, the quality of education in the second decade of its implementation has aroused the concern of the public in general and educators in particular. A comprehensive review of compulsory education has revealed that mathematics, next to English, is the subject which children find most difficult (Wong, 2000). Moreover, the proportion of students who encounter difficulties in learning mathematics increases from Primary 3 onward. This indicates a need to improve curriculum and instruction in this subject.

The school curriculum is a major factor in shaping the quality of education (CRDD, 2007). It has been recognised that the quality of mathematics education directly affects learning in other scientific disciplines, hence influencing the development of human resources in the field (see for example, Awanta, 2005, CRDD, 2007). This is seen most necessary in a developing country such as Ghana, where every citizen needs to become mathematically literate (CRDD, 2003).

Research and experience in different parts of the world suggest that comprehensive appraisals should be carried out before the commencement of curriculum reform (Lawton, 1989; Skilbeck, 1984). Certainly, comprehensive appraisals of curriculum reform before its commencement were performed in countries other than Ghana. "Mathematics Counts" (Cockcroft's Report of the Committee of Inquiry into the Teaching of Mathematics in Schools: Cockcroft, 1982) of the United Kingdom and "Everybody Counts" (Report to the Nation on the Future of Mathematics Education: Mathematical Sciences Education Board, 1989) of the United States are two well known examples of research into mathematics education.

In response to the needs for a comprehensive curriculum review in Ghana, the government of Ghana, for that matter the Ministry of Education and the Ghana Education Service, requested for the conduct of a holistic review of the curriculum from primary school right up to the Senior High School. The purpose of this was to

investigate the views of various stakeholders, including students, teachers, parents, university professors, employers and curriculum planners, on the existing curriculum, including mathematics curriculum. The focus of this article is on students' views of mathematics.

Just as issues of Ghanaian Mathematics Teachers' conceptions of mathematics and its teaching (Awanta, 2007) have been investigated, the close relationship between students' view on mathematics and their learning of mathematics has been widely recognised (e.g., Pehkonen and Torner, 1998; Schoenfeld, 1989, 1992; Silver, 1985; Underhill, 1988; Wittrock, 1986). In the present article, the researcher studied students' views of mathematics and mathematics learning, including their conception of mathematics, their attitude toward mathematics, their learning habits in mathematics, and their perceived difficulty in learning mathematics. The findings, I believe, will present an important reflection of the realistic learning situation of mathematics class in Ghana from the learners' perspective. In order to elaborate, the researcher aimed at investigating the following in the study:

1. students' conceptions of mathematics (e.g., "Is mathematics seen as being calculable and useful, and involving thinking?");
2. students' attitudes toward mathematics learning such as interest, preference for understanding and confidence;
3. their perceptions of classroom learning and the habit of learning mathematics; and
4. the levels of difficulty of various topics as perceived by the students.

2. METHODOLOGY

2.1 Sampling and Administration

The study was carried out in the month of April 2008 in two regions of Ghana, the Ashanti and Brong-Ahafo Regions. Ghana is divided into 10 politically-administrative regions. The survey went through a two-step convenience sampling procedure to select students (respondents) for the study. The convenience sampling procedure was employed because the researcher was on his rounds in these regions for the purpose of supervising his undergraduate students who were on internship (teaching practice) programme. First, a sample of 10 junior high schools and 15 senior high schools out of

all government assisted schools in these two regions was selected. Second, participating students were selected using a random sampling technique. The students in these classes were requested to respond to a questionnaire. The overall return rate was 95%. The characteristic of the respondents are listed in Table 1 and the numbers of respondents in different streams (Science, Arts, and Vocational) in senior high are listed in Table 2.

Table 1: Characteristic of Respondents

	Junior High	Senior High	Total
Male	270	300	570
Female	80	150	230
Total	350	450	800

Table 2: Streams of the Respondents in Senior High School

Arts	Science	Vocational	Others	Total
270	100	132	11	450

2.2 Instruments

In the questionnaire students were requested to:

1. rate the level of perceived difficulties of the topics they learned in the current academic year, and how difficult they find the learning of specific topics within the curriculum;
2. respond to 20 individual questions about their attitude toward and habits of learning mathematics, such as their confidence in doing mathematics and their dependence on teachers and textbooks;
3. respond to 15 individual questions about their conception of mathematics (the item about "what they think mathematics is" was excluded from the junior high school questionnaire to make it shorter for these young students);

4. indicate the time they spent in the previous week on homework in general and mathematics homework in particular; and
5. indicate whether they had private tutors (or attended tutorial classes) outside their schools.

The questionnaire items for all grade levels were set in English, the official language of the respondents. Pilot tests of the student questionnaire were performed with 100 students (35 from University Junior High, Winneba, 50 from Winneba Senior High and 15 from Apam Senior High). Based on the feedback about the pilot tests, a number of minor amendments and standardisation in procedures were made. This, in a way established the reliability of the questionnaire. The questionnaire was also validated by the researcher observing a sample of respondents to determine the degree to which their actual behaviour was consistent with their responses. Details of the instruments used are listed as follows.

2.3 Perceived Level of Difficulty

The topics used in the questionnaire were taken from the mathematics syllabuses issued by the government (CRDD, September 2007). Students were requested to rate the level of perceived difficulty of each of these topics on a 5-point Likert scale (1 = very difficult, 2 = difficult, 3 = fairly easy, 4 = easy, and 5 = very easy). Since the questionnaire was administered in April (i.e., near the end of the academic year), most of the topics listed should have been taught. However, if the topic had not yet been taught, students were requested to check across the column "not yet taught" instead of rating the level of difficulty. For each individual topic, those respondents who reflected that the topic had not yet been taught did not go into the analyses.

2.4 Attitude toward Mathematics and Habits of Learning

The subscale comprised 3 items on interest, 4 items on preference for understanding, 3 items on confidence, 3 items on competence, 4 items on textbooks and classroom learning, and 3 items on outside-class learning. They were set in a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = fairly agree. 4 = agree, 5 = strongly agree). It was supplemented by 2 items on habits of learning, with four options each. These options can be found in Table 6.

2.5 Conceptions of Mathematics

The Conception of Mathematics Scale was adopted from a grounded research conducted by Wong, Lam and Wong (1998). It consisted of 6 items on the notion that "mathematics is a subject of 'calculables'" (sample item: "Mathematics is a subject that involves addition, subtraction, multiplication and division"), 6 items on "mathematics involves thinking" (sample item: "learning mathematics cannot be relied on rote memorisation"), and 3 items on "mathematics is useful" (sample item: "Mathematics is widely applicable in daily life"). They were set in a 5-point Likert scale.

3. DATA ANALYSIS AND RESULTS

Perceived Difficulty of Topics

At present the Junior High School has only one general mathematics syllabus. The same applies to the Senior High School. The main rationale for the mathematics syllabus in Ghana is focused on attaining one crucial goal: to enable all Ghanaian young persons acquire the mathematical skills, insights, attitudes and values that they will need to be successful in their chosen careers and daily lives (CRDD, 2007). These syllabuses therefore require a strong mathematics background.

A list of topics was given to the students for rating. The topics were taken from the mathematics syllabuses issued by the government (CRDD, 2007). Students were requested to rate the level of perceived difficulty of each topic on a 5-point Likert scale (1 = very difficult, 2 = difficult, 3 = fairly easy, 4 = easy, and 5 = very easy). The result is summarised in Table 3.

Table 3 shows that as students moved up the grade levels, they found mathematics more and more difficult. The mean score of Junior High students' rating was 4.24, with a downward trend to about 2.6 in Senior High. In the Junior High the topics with the greatest perceived difficulty were "Algebraic Expressions" and "Linear Equations and Inequalities". The easiest topics were "Collection and Handling Data" and "Integers" (Addition and subtraction of fractions with the same denominator). In comparison, it is observed that the easy topics for students are those which do not involve tedious calculations.

In the Senior High, the range narrowed slightly but the mean continued to drop noticeably. In fact, none of the topics had a mean score higher than 4. The most difficult topics were "plane geometry" and "vectors in a plane." Even though it is not captured in the table, data analysed indicated that even some perceived easy topics ("number bases, relations and functions, percentages, surds, ratio and rates") had a low mean score.

Table 3: The Two Easiest and the Most Difficult Topics as Perceived by Students

	Range and Mean	The two easiest topics and their mean scores (in parenthesis)	The two most difficult topics and their mean scores (in parenthesis)
Junior High	3.81-4.68 Mean=4.24	▪ Collection and Handling Data (4.68) ▪ Integers (Addition and subtraction of fractions with the same denominator) (4.56)	▪ Algebraic Expressions (3.81) ▪ Linear Equations and Inequalities (3.82)
Senior High	2.71-3.47 Mean= 2.66	▪ Statistics (3.47) ▪ Set and Operations on Set (3.47)	▪ Plane Geometry (2.71) ▪ Vectors in a Plane (2.94)

Although all the topics were designed for easy understanding by students, they did not appear to be easy for them. The ratings for all the topics were found in a narrow range.

Students' Attitudes toward Mathematics

As shown in Table 4, the statements that Junior High students most agreed to were "I wish there could be more pictures in the textbook so that I can understand the content better" (mean = 4.16: those who agreed outnumbered those who did not by 65%), "I have confidence in doing numerical computations" (mean = 4.022, difference = 64%) and "I am interested in mathematical calculations" (mean = 3, difference = 57%). On the other hand, the three statements that these students most disagreed to were "Understanding the content is unimportant; but it is important to know how to do the calculations in examinations" (mean = 2.00, difference = 59%), "It is not necessary to read the textbook; the teacher will explain everything" (mean = 2.27, difference = 42%), and "I seldom try those problems not required by the teacher" (mean = 2.61, difference = 25%). It is obvious, therefore, that their responses were unanimously positive with regard to their attitude toward the subject.

For Senior High students, the three statements that they most agreed to were "I have confidence in doing pure numerical computations" (mean = 3.73, difference = 46%), "I wish there could be more pictures in the textbook so that I can understand the content better" (mean = 3.64, difference = 39%), and "If I understand the concept concerned, I can always find a way to calculate the problems" (mean = 3.58, difference = 38%). Though the responses were still relatively positive, they began to diversify slightly. The three statement students most disagreed to were "I often take part in mathematics extracurricular activities (mean = 2.14, difference = 60%), "Understanding the content is unimportant; but it is important to know how to do the calculations in examinations" (mean = 2.16, difference = 58%), and "It is not necessary to read the textbook; the teacher will explain everything" (mean = 2.20, difference = 57%).

Table 4 : The Three Statements Most Agreed to and the Three Statements Students Most Disagreed to

	Statement that most agreed to	Statement that most disagreed to
Junior High	▪ "I wish there could be more pictures in the textbook so that I and understand the content better." ▪ "I have confidence in doing numerical computations." ▪ "I am interested in mathematical calculations."	▪ "Understanding the content is unimportant; but it is important to know how to do the calculations in examinations." ▪ "It is not necessary to read the textbook; the teacher will explain everything." ▪ "I seldom try those problems not required by the teacher."
Senior High	▪ "I have confidence in doing pure numerical computations." ▪ "I wish there could be more pictures in the textbook so that I can understand the content better." ▪ "If I understand the concept concerned, I can always find a way to calculate the problems."	▪ "I often take part in mathematics extracurricular activities." ▪ "Understanding the content is unimportant; but it is important to know how to do the calculations in examinations." ▪ "It is not necessary to read the textbook; the teacher will explain everything."

Trends of Students' Attitudes

In order to have a clearer picture of the trends of students' attitude toward mathematics, observations were made according to these categories: interest; preference for understanding; confidence and competence; textbooks, classroom learning and outside-class learning; learning habits; and conceptions of mathematics.

Interest

Table 5 reveals that students' interest in solving mathematical problems, attending mathematics classes, and mathematical calculations all dropped substantially from Junior High to Senior High although their interest in leaning mathematics maintained a score close to 3 throughout the grade levels.

Preference for Understanding

Table 5 shows that, in general, students at all levels realised that understanding was important. This is reflected in the low score (2.00 to 2.27) for "Understanding the content is unimportant …" and the high score (3.86 to 3.47) for "If I understand the concept concerned, I can always find a way to calculate the problems." Although there was a concern for understanding the reasons behind a formula, there was a slightly decreasing trend in this concern from Junior High to Senior High. Students tended to be more receptive to formulas in the higher grade levels.

Confidence and Competence

As far as confidence is concerned, the students' confidence in numerical computations and solving word problems dropped continuously. A similar pattern was found in how they perceived their competence in understanding the content in the mathematics class. A slight increase was also found in the mean score of the statement "Though I know how to calculate, sometimes I don't know the reasons for the calculation."

Table 5: Trends of Students' Attitudes toward Mathematics

Item	Level	
Interest	JHS	SHS
I love solving mathematical problems.	3.82	3.19
I am very interested in attending mathematics classes.	3.86	2.99
I am interested in mathematical calculations.	3.91	3.03
I seldom try those problems not required by the teacher.	2.61	3.02
Preference for understanding		
Reading the explanations in the textbook is not necessary, we can learn just by reading the formulas.	2.27	2.20
When learning a new topic, I wish that the teacher could tell us the formula right away and not ask us to look for it for ourselves.	2.48	2.73
When learning a new topic, I wish that I could think it through by myself first and not having the teacher telling me everything.	3.57	3.30
Understanding the content is unimportant; but it is important to know how to calculate in examinations.	2.00	2.16
If I understand the concept concerned, I can always find a way to calculate the problems.	3.86	3.58
In learning a new topic, I am not concerned with how the formulas come about; I only care about how the formulas are applied in solving problems.	2.64	2.80

Confidence		
I have confidence in problems that involve substituting numbers into formulas.	3.30	3.08
I have confidence in doing pure numerical computations.	4.02	3.73
I have confidence in doing word problems.	3.73	2.95
Competence		
I fully understand the content in the mathematics class.	3.61	2.97
Usually I fully understand word problems.	3.53	2.93
I have difficulty in solving word problems.	3.06	3.05
Though I know how to calculate, sometimes I don't know the reasons for the calculation.	3.14	3.36
Textbook, classroom learning and outside-class learning		
Usually I won't confine myself to reading the formulas of the textbook but I read the explanation in the textbooks.	3.17	2.89
Teachers often ask us to read the explanation in the textbooks.	3.49	3.25
It is not necessary to read the textbook; the teacher will explain everything.	2.51	2.59
I wish there could be more pictures in the textbook so that I can understand the content better.	4.16	3.64
I hope that I could have less homework.	.95	3.40
I would use calculators for numerical calculations.	-	3.32
I often read mathematics "supplementary readers."	3.11	2.30
I often take part in mathematics extracurricular activities.	2.96	2.14

To recapitulate, the trends in the above domains were consistent. Students did realise that just knowing how to calculate was not enough and understanding the concepts behind the calculation steps enabled one to be more effective in finding ways to solve problems. It is clear that students' interest and confidence dropped continuously as they moved up the grade levels. The drop was especially significant from JHS to SHS. The same is true for their perceived competence in doing mathematics, especially in solving word problems.

Textbooks, Classroom Learning and Outside-class Learning

As the students moved up the grade levels, they relied more and more on textbooks. Younger students hoped for a more lively approach in their textbooks, such as the inclusion of more pictures. It is worthwhile to note that JHS is the only grade level that feels a pressure induced by homework. This is probably due to the need to prepare for the senior high school place allocation examination (Basic Education Certificate Examination) that takes place at the end of JHS 3. A low level of participation in mathematics-related extracurricular activities was also found.

Learning Habits

Table 6 reveals the part on students' learning habits in the questionnaire. The results indicated that most JHS students took positive steps (e.g., consulting the teacher) to solve their problems and were reluctant to give up when they encountered learning difficulties. This habit shifted at SHS. Their intention to consult the teacher dropped noticeably. They preferred to seek help from their classmates. It is also at this grade level that most students did not mind copying the work of others. This is alarming. Fortunately, the rate of choosing to give up at this grade level was still low. This may be because peer influence is not quite strong until the stage of adolescence. The most worrying attitude toward learning difficulties was found among SHS students, who had the highest rate of opting for giving up. Most of the students did not know how the mathematics they learned could be applied, and the extent of difficulty they encountered in learning mathematics increased with the grade levels. The same was also true for the extent of mathematics topics they did not understand.

As reported by the students, they used, on average, 7.39 hours per week on homework, and 2.19 out of the 7.39 hours per week on mathematics homework (no table displayed

for this). The proportion of time spent on mathematics homework was around 30%, which was consistent with the figures obtained in earlier studies (Wong, 1992; Wong and Cheng, 1991a,). The highest percentages occurred at SHS. Furthermore, over 30% of the students either had private tutors or joined tutorial classes.

Table 6: Learning Habits of Students

Item	Percentage	
	JHS	SHS
When I meet difficulties in learning mathematics, I will		
(a) consult the teacher	41.2	18.8
(b) discuss with classmate	41.4	53.3
(c) search for references	15.9	23.8
(d) give up	1.4	8.1
When I meet difficulties in solving mathematics problems, I will		
(a) insist on working them out by myself	25.2	9.0
(b) accept others' advice	61.7	31.9
(c) accept others' assistance	10.9	43.2
(d) don't mind copying others' work	2.2	15.8
The extent of topics that students did not know their applications (on a 5-point scale)	2.74	2.81
Number of hours spent weekly on homework	8.61	8.78
Number of hours spent weekly on mathematics homework	2.31	2.61
Time spent on mathematics homework	26.8	29.7
Students having tutors or tutorial class	30.8	33.6

4. DISCUSSION

Previous studies (Lam, Wong and Wong, 1999; Wong, Lam and Wong 1998) reveal that students often perceive mathematics as a subject of "calculables," which could be the most tangible part of mathematics. Students in the early grades felt quite confident when tackling something that they can manipulate step by step. However, if this view is reinforced and the student sees this as the only aspect of mathematics, it could be an obstacle to deeper understanding of the discipline. Another facet of students' conception of mathematics is that mathematics involves thinking: mathematics is a "thinking exercise"; just as "physical exercises" strengthens the body, so doing mathematics strengthens the mind. Such a conception is common among the teachers, too (Awanta 2007 and Wong, 2001). Another dimension of students' conception of mathematics found in earlier research studies is that mathematics is useful, particularly when applied to daily life.

Using the Conception of Mathematics Scale which was developed according to these three dimensions (mentioned above) and the findings of earlier empirical research (Lam, Wong and Wong, 1999; Wong, Lam, a nd Wong 1998), it is found in the present study (as presented in Table 7) that the subjects strongly agreed with the statements in the subscale "mathematics is a subject of 'calculables'." The mean score ranged from 3.27 to 3.38. The perception that "mathematics involves thinking" was even stronger; the mean score for JHS was 3.90 and it continued to increase to 3.92 at SHS. As for the usefulness of mathematics, in general, students perceived mathematics as a useful subject.

Table 7: Students' Conception of Mathematics

Sub-scale	Mean (on a 5-point Scale)	
	JHS	SHS
Mathematics is a subject of "calculables."	3.38	3.27
Mathematics involves thinking	3.90	3.92
Mathematics is useful.	3.72	3.24

The research findings revealed that JHS students were generally interested in mathematics but then the interest dropped substantially, especially at SHS. Among all students, the interest in attending mathematics lessons was not as high as the interest in mathematics itself. They also possessed a very positive attitude toward mathematics, opting for deep understanding rather than rote learning. Items in this aspect were mostly rated as "strongly agreed." Students unanimously agreed to the statement "When learning a new topic, I wish that I could think it through by myself first and not having the teacher telling me everything," and strongly disagreed with the opposite statement "When learning a new topic, I wish that the teacher could tell us the formula right away and not ask us to look for it for ourselves." This may surprise many of our mathematics teachers. The students' responses in the present study reflected that they were not only concerned about how the formulas are applied to solving problems, but also how the formulas come about. They tended to believe that if one understands the concept concerned, one can always find a way to solve problems.

In addition, students showed confidence in solving problems, especially numerical and routine problems. However, they had trouble with word problems. Their confidence with word problems dropped as they moved up the grade levels. It is possible that competence in language (English, in most cases) might have adversely affected performance in solving mathematical word problems.

However, this does not mean that students did not encounter problems in learning mathematics. They faced real (actual) learning problems – the discrepancy between what one hopes for and what one can really do. This could be the source of frustration and helplessness. This is evident from the fact that they strongly agree with the statement "Though I know how to calculate, sometimes I don't know the reasons for the calculation."

When we look at the perceived difficulty of topics, we get a pessimistic picture. On moving up the grade levels, students' attitude toward mathematics learning became more and more negative and they perceived greater difficulty in the topics learned. There are a number of speculations on the reasons behind this, but certainly we have to take into consideration that younger students may underestimate the learning difficulty they are facing. However, since mathematics is an "accumulative" subject, decreasing interest and accumulating learning problems at junior levels may turn out to be major learning difficulties at senior levels, especially when the content of learning becomes more abstract and requires more conceptual understanding.

If our students have interest and a high regard for mathematics, their declining performance could be attributed not only to their competence, but also to the mismatch of the curriculum in a broader sense. Curriculum developers and teachers should reflect upon whether our intended curriculum (curriculum documents, textbooks) and our implemented curriculum (including classroom teaching and teaching style) suit the needs of our students and help them to sustain their interest in the subject throughout their schooling. The desire for more pictures in the textbooks may be taken as an indicator of the urge for liveliness in teaching and teaching materials. The lack of interest in participating in mathematics extracurricular activities (including "supplementary readers") as indicated by the students' responses lend support to this speculation. Whether the problem lies in the lack of provision of extracurricular activities, lack of enthusiasm in participation, or lack of time due to heavy homework needs further investigation and is beyond the scope of this research.

The research suggests that more attention should be paid to the two grade levels, namely JHS and SHS. The interest in mathematics dropped noticeably at SHS, which was the only grade level that students hoped for less homework. The researcher is not sure whether this is resulted from the pressure of the BECE examination on JHS 3 students. But definitely, over-drilling can hamper understanding, which needs both time and space to promote.

Students also showed no interest in mathematics textbooks, and they were also reluctant to make an effort to understand the subject. Besides, the rate of opting for giving up (when facing learning difficulties) was highest at SHS. One of the reasons might be the inadequate provision of help to those who lag behind. Why was the problem so serious at SHS? Basically, as students moved up the grade levels, they became more and more negative toward mathematics. However, those who were able enough to remain in the school system were, perhaps, more academically motivated. Moreover, students may choose not to study mathematics at this level.

5. CONCLUSIONS AND POLICY IMPLICATIONS

It is not easy (and may not even be desirable) to summarise a list of topics that students found the most difficult (or the easiest). But it seems that those topics involving technical (if not tedious) manipulations were least welcome by the students, whereas those requiring visual and hands-on experiences were students' favorites. Apparent difficulty and impracticality were also some of their concerns.

The new mathematics curricula for the new millennium (21st Century) have recently been published (CRDD, September 2007). Nevertheless, this is just the beginning of curriculum reform. A great deal of effort is needed to ensure that the spirit of the curricula is understood and practised by all concerned. In this light, the present research offers timely information on the learning style of students and the difficulties they face. The rich data collected in this research offer curriculum planners and frontline teachers a full picture of mathematics education in Ghana, where the study was conducted. With this information in hand, curriculum planners and teachers should be able to have a better curriculum implementation. On the other hand, there is a pressing need to cater for learner differences and to devise means to help students with learning difficulties. Curriculum tailoring and differentiation should be considered. In such an examination-oriented culture, every care should be taken to safeguard students from ever-increasing examination pressure and its backwash. These research findings could help not only educators in the two regions that the research was conducted, but also those in Ghana generally, to understand how students perceive mathematics learning.

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