



Problems Concerning the Teaching and Learning of Secondary Schools Mathematics in Adamawa State; Issues and Prospects

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Abstract

Mathematics is quite rich in concepts which directly translate to proper life skills. The importance of mathematics to everyday living cannot be over emphasized. The mathematics curriculum in Nigerian secondary schools is developed and structured around four major concepts: Number and Numeration, Algebraic processes, Geometry and Menstruation and everyday statistics. Mathematics is an important pillar of the future and helps to develop human thinking and man's comfort. Teaching mathematics is a process which aims to present mathematics for the students in an easy and acceptable method. Mathematics gives the teacher a bigger role in guiding and organizing the learning process, to encourage the students to learn. It is important to identify students who experience difficulties to learning as early as possible. This research investigates teachers 'challenges in mathematics teaching, and Students challenges in learning.

Keywords: *Problems Concerning Teaching Learnin Secondary Mathematics Adamawa*

Introduction

Odili (2006) defines mathematics as a body of knowledge, a collection of techniques , methods, and the product of human activity for solving problems. Mathematics is a major

aspect of our educational system since its application cuts across all areas of human endeavor. For instance, from social or economics perspective mathematics is a key element in our

day-to-day living that every human being practices in one form or the other. These concepts have direct bearing on people's way of life. Taking the concept of commercial arithmetic under numbers and numerations, several life skills that can be taught ranges from how to prepare "ready reckoners" for some groceries at shops, how to budget wisely and be able to live within one's means Bidwell (1993) viewed teaching as a series of interaction between the teacher and the learners with the explicit goal of changing one or more of the learner's cognitive or effective states. Therefore, mathematics teaching can be seen as the interaction between the teacher and the learners to acquire the described mathematical knowledge, skills, and ideas necessary for becoming functional members of the society. Teaching mathematics is a process which aims to present mathematics for the students in an easy and acceptable method (Carver, 2001). The success of this process relies on several factors; the most important of these factors are the academic qualifications of the teacher and his attitudes toward mathematics teaching (Camacho et al., 1998).

The mathematics teacher job is to transfer the knowledge to learners, taking care of the students' thinking and directing their minds for thinking during the process of teaching mathematics, the teachers confront obstacles in different domains such as: mathematical knowledge, methods of teaching mathematics, planning for teaching mathematics, assessment techniques and the individual differences between students (Paulo, 2002; Horner, 2003; Billings and Klanderma, 2000).

The mathematics teacher is no more a link between the scholastic textbook and the learner minds, whose job is just to transfer the knowledge to them; the teacher now has the biggest role in achieving the educational goals, taking care of the students' thinking and directing their minds for thinking (Houssart et al., 2005; Souviney, 1994; Kajander, 2010; Remillard, 1999). From this point of view of the mathematics teacher and his roles, the preparation programs of the mathematics teachers provide the teachers with the needed knowledge and teaching skills, and give them the positive attitudes toward mathematics teaching.

PROBLEM OF TEACHING MATHEMATICS

Pedagogical content knowledge and teaching skills are considered as obstacles which face the teacher in teaching mathematics (Wilson et al., 2007; Rossner, 1992). Chakalisa et al. (1999) pointed that teachers confront the following

obstacles of teaching mathematics: determining the lesson goals, planning for teaching mathematics, executing mathematics lesson, determining the appropriate time for each teaching activity, classroom management and motivating the students toward learning mathematics (Chakalisa et al., 1999). Findings revealed that high school teachers had significantly higher content knowledge than middle school teachers; teachers with strong mathematics backgrounds had significantly higher content knowledge than teachers who did not have strong mathematics backgrounds; and mathematics and science majors had significantly higher content knowledge than other majors. Further, it was found that mathematics content knowledge was not related to attitudes toward mathematics and teachers' efficacy; thus, teachers had the same high positive attitudes toward mathematics and same high teachers' efficacy, regardless of content ability. The success of this process relies on several factors; the most important of these factors are the academic qualifications of the teacher and his attitudes toward mathematics teaching (Camacho et al., 1998). During the process of teaching mathematics,

Classroom management is considered as one of the most important obstacles of teaching mathematics (Brooks, 2007). Pedagogical content knowledge and teaching skills are considered as obstacles which face the teacher in teaching mathematics (Wilson et al., 2007; Rossner, 1992). Chakalisa et al. (1999) pointed that teachers confront the following obstacles of teaching mathematics: determining the lesson goals, planning for teaching mathematics, executing mathematics lesson, determining the appropriate time for each teaching activity, classroom management and motivating the students toward learning mathematics (Chakalisa et al., 1999).

Berlin and White (2010) explored the attitudes and perceptions related to the integration of mathematics, science, and technology education of three cohorts of pre-service teachers enrolled in the first 3 years of the program. Eighty-one pre-service teachers responded to a semantic differential to measure attitudes and perceptions related to mathematics, science, and technology education integration. Results indicated no change in pre-service teacher attitudes and perceptions related to the value of integration; they clearly valued integration at the onset and completion of the program.

Identification Of Mathematics Difficulties In Secondary School Student

Mehaffie and Greenberg have clearly documented that the early identification of students who experience difficulties to learning is of critical importance in

enabling such youngsters not only to make greater progress but to become participating members of society. It is important to identify students who experience difficulties to learning as early as possible. If students who experience difficulties to learning can be identified during early childhood development, they stand a better chance of success since the problem can be addressed. Early identification of learning mathematics difficulties provides a foundation for later learning and academic success experiences for the students at risk. Early identification also prevents secondary difficulties from occurring and students who are identified early will have a greater chance of not developing secondary difficulties such as frustration and anxiety.

Curriculum Implementation

Educators perform well if there is certainty and stability in the curriculum and education system. Educators who were trained at colleges and universities for a particular curriculum have to assimilate and accommodate the new education dispensation regarding curriculum transformation and change. Thus, Mathematics teachers have to assimilate and accommodate these changes in order to implement the compulsory Mathematics curriculum at senior secondary level effectively and efficiently.

Teacher motivation in the teaching and learning of Mathematics

Instructional leadership encompasses those actions the management takes and delegates to others to promote growth in student learning. Instructional leadership of the management has a positive and direct effect on student achievement. Thus, it is clear that the purpose of the management instructional leadership role is to facilitate effective teaching and learning.

Educators do well in curriculum implementation when they are motivated. According to Maslow's (1943) theory, people have the need for esteem. This includes factors such as recognition, attention, social status and accomplishment. The atmosphere in our education system should motivate Mathematics teachers to work hard for the successful implementation of the compulsory Mathematics curriculum at senior secondary school level. Mathematics teachers must feel that they are supported by the school management, advisory teachers and inspectors for them to successfully implement the compulsory Mathematics curriculum. Their efforts should be recognized and they should be rewarded for outstanding achievements.

Therefore, the school management should lead the implementation of the new curriculum in the school, for they are the key troupes in facilitating, guiding and supervising of the implementation process (Ngara et al., 2013 Based on this, MEC (1993) notes that effective teaching and learning requires teachers who are not only competent in their subjects but who can also respond creatively to new situations

The Education Alliance (2006) looked at a variety of research studies, and identified a list of instructional strategies that could be considered to be best practices in mathematics education:

- Focus lessons on specific concept/skills that are standards-based
- Differentiate instruction through flexible grouping, individualizing lessons, compacting, using tiered assignments, and varying question levels
- Ensure that instructional activities are learner-centered and emphasize inquiry/problem-solving
- Use experience and prior knowledge as a basis for building new knowledge
- Use cooperative learning strategies and make real-life connections
- Use scaffolding to make connections to concepts, procedures, and understanding
- Ask probing questions which require students to justify their responses
- Emphasize the development of basic computational skills (p. 17)

The National Center for Educational Achievement (NCEA, 2009) examined higher performing schools in five states (California, Florida, Massachusetts, Michigan, and Texas) and determined that in terms of instructional strategies, higher performing middle and high schools use mathematical instructional strategies that include classroom activities which:

- Have a high level of student engagement
- Demand higher-order thinking
- Follow an inquiry-based model of instruction – including a combination of cooperative learning, direct instruction, labs or hands-on investigations, and manipulatives

- Connect to students' prior knowledge to make meaningful real-world applications
- Integrate literacy activities into the courses – including content-based reading strategies and academic vocabulary development

Additionally, NCEA researchers found that it was important for teachers to create classrooms that foster an environment where students “feel safe trying to answer questions, make presentations, and do experiments, even if they make a mistake” (p. 24).

Effective Mathematics Instruction with Less Effective Mathematics Instruction
 In general, there are two prevalent approaches to mathematics instruction. In skills-based instruction, which is a more traditional approach to teaching mathematics, teachers focus exclusively on developing computational skills and quick recall of facts. In concepts-based instruction, teachers encourage students to solve a problem in a way that is meaningful to them and to explain how they solved the problem, resulting in an increased awareness that there is more than one way to solve most problems. Most researchers (e.g., Grouws, 2004) agree that both approaches are important – that teachers should strive for procedural fluency that is grounded in conceptual understanding. In fact, the notion of numerical fluency, or the ability to work flexibly with numbers and operations on those numbers (Texas Education Agency, 2006), lies at the heart of an effective algebra readiness program.

Conclusion

It is clear that Mathematics teachers indicate that they have the knowledge, experience and skills to teach Mathematics. However, changes in the teaching environment can affect the teaching and learning process. If the implementation of the curriculum is not well planned, it can make it difficult for teachers to teach effectively and efficiently. Teaching and learning of mathematics for Self-reliance implies making the learners see mathematics beyond the classroom boundaries. It means that learners must be brought to the real world of issues and relate the mathematics they learned to the realities of life or societal mathematics with the aim of promoting responsible citizens

Recommendation

- ❖ Mathematics teachers should endeavor to relate mathematics concepts to real life situations. portrays the aesthetics side of it

- ❖ Government should employ more mathematics teachers and supply adequate instructional materials and equip mathematics laboratory for effective teaching and learning of mathematics
- ❖ Mathematics curriculum planners should ensure that, there is an inclusion of proper comparative aesthetics mathematical images in all secondary schools curriculum
- ❖ The preparation programs of the class teacher must focus on both content mastery and methods of teaching it effectively, it should be all teachers for them to assist both the teacher and their children
- ❖ The educational administrations must also work on providing the class teachers with the educational material, tools needed in teaching mathematics, motivations and protection

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