

## **Appraisal of Teacher and Student Issues for Effective Teaching and Learning of Mathematics in the Secondary School.**

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### **Abstract**

Mathematics teachers are responsible for ensuring that the students get the knowledge and skills that would enable them succeed in the classroom as well as future career. They also ensure that mathematics empowers the students to become productive citizens of the society. In spite of these, there are issues that worry them which need to be addressed for effective teaching and learning to take place. The issues include prior knowledge, relating the learning material to real life among others. The steps to be taken in addressing the issues are also discussed which included among others: administration of prior knowledge assessment at early stage of the subject, building confidence in the students, ensuring that homework is at the appropriate level of difficulty.

**Key Words:** *Issues, Mathematics, Teachers, Prior Knowledge.*

### **Introduction**

Mathematics is a subject and also a career course which is essential in our everyday activity. The importance of mathematics in the economic, scientific, political and technological development of any nation cannot be overlooked. No wonder every nation of the world makes mathematics a compulsory subject in every sphere of the education system. Kolawole, Oladosu and Ajetumobi (2013) described mathematics as a tool for enhancing the learning of the school subjects. They further described it as an essential instrument for solving problems conditions in all fields. The mathematics teachers are responsible for ensuring that the students have knowledge and skills that will enable them succeed in the classroom as well as future career. They also equip the students with mathematical knowledge which empowers them to become productive citizens of the society. Kolawole and Oluwatayo (2008) in Ochuenwike (2015) opined that effective teacher develops mathematical ideas and skills in his students which they can use for further study, in solving everyday problem and for personal needs. No teacher being confronted by many challenges in his work can perform effectively which eventually would affect learning on the part of the students.

Several studies have highlighted some of the factors that constitute challenges to effective teaching and learning of the subject. These include; Peter (2013), who observed that absence of special allowances, dearth of mathematics teachers and students' lack of interest in the subject; workload (Adetunji, 2012), and lack of motivation (Ahiakwo, 2006) respectively constituted challenges to mathematics teachers. In spite of all these challenges faced by the mathematics teachers in the course of performing their functions in the classroom, there are still some issues that impede their effective performance. This paper therefore, sought to discuss some of the issues that concern mathematics teachers in the classroom and the ways forward.

### **Issues of Concern for Mathematics Teachers**

The issues can be categorized as:

**Issues of Basic or Prior Knowledge:** Mathematics curriculum is designed in such a way that any new concept to be learned is built on the information learned on previous years. When a student lacks the prior knowledge of the material to be presented, it constitutes a challenge to the mathematics

teacher. She may be faced with the option of either to take remedial measures or forge ahead and cover the material, which the student concerned might not understand. This issue needs to be addressed.

#### **Addressing the Issue of Prior/Basic Knowledge**

The issue of prior knowledge can still be addressed in different ways. Telle (2008) from his study on relevance of prior knowledge in learning and skill reported that prior knowledge from previous lessons significantly influenced student achievement. Telle therefore suggested that student's prior knowledge should be taken into consideration in instructional design and curriculum planning. Also prior knowledge assessment result may be used as a tool for student support in addressing areas of deficiency.

Mathematics teachers are advised to administer a prior knowledge assessment at the early stage of the course. This will help the teacher to ascertain the student's level of prior knowledge and skills. The assessment can enable the teacher to diagnose the student's understanding or competence with the material they are expected to have. By this, the teacher can design his/her prospective instruction and examination appropriately.

The teacher should adjust the instruction when insufficient prior knowledge of the lesson topic influences many students. In this case, the teacher is advised to make room for remediation which may involve spending extra time of the class to explain the topic. When inadequate prior knowledge affects minority of students the teacher is advised to guide the student. In this case, the mathematics teacher can counsel the students involved individually depending on the nature of the deficiency in their understanding and skills.

#### **Relating the Learning Material to Real Life**

Mathematics is widely applied to our daily life. But oftentimes, there are topics that the students find difficult to see their relationship to real life. They cannot explain why they do them. Such topics include: geometry, trigonometry, basic algebra, matrices, probability etc. When students lack sight of the reason for learning a topic enthusiasm is often dampened as well as their retention capacity. Mathematics teachers are faced with the task of making the learning material real to the students. They can use familiar objects, shapes and designs as examples to teach geometry. For instance empty cans of milk, Milo etc can be used to teach area of a cylinder. Tossing of a coin or a die can still be used to teach the students basic probability. This can help to arouse students' interest in the subject.

**Dealing with Students with "Math phobia":** Some students have the belief that mathematics is very hard to learn. They just conceive it in their heart that they are not good in mathematics. This negative attitude can lead students to defects in learning certain topics in the subject. Ewart (2015) suggested that teachers can help their students overcome the fear of mathematics by building confidence in them. Students should be given regular confidence building exercises in the topic taught. Such exercises may look challenging but, interesting and still allow all students to do well. This will increase their confidence and self efficiency.

Mathematics teachers are advised to strengthen student's basic skills by giving them chances to perform and master fundamental skills for computational confidence. Assist them to practice mental mathematics and basic skills regularly, limbering up activities, put them into groups so they can learn from one another.

Use of bit- by- bit method can help to cob the students' fear of the subject. Presenting the material bit-by-bit would help the students to understand. Students should be allowed to master one step before moving to the next.

The teachers are also required to help the students to develop a positive mindset. Encourage them to believe they can take risk and have a positive attitude. Give the students problems that get harder, and show them that they can overcome any challenge through hard work and practice.

Lastly, the attitude of teachers towards mathematics needs to change from negative to positive as it can influence students. Teachers should create positive and active learning environments by bringing mathematical games and puzzles into their examples. If mathematics teachers can adopt and adapt these strategies students will no longer hate mathematics.

### **Dealing with Students Absence from the Class:**

Sometimes, a student may miss mathematics classes at vital instructional points. When this happens it can be tedious for such student to meet up. For instance, if a student happens to be absent on the first few days a new topic is introduced and explained, the teacher would be faced with the issue of helping that student to learn the material on his own. Some students in some cases dodge classes tactically for reasons best known to them. Some of the probable reasons may be hatred for the subject, nonpayment of school fees, indulging in menial jobs and so on.

**Proffered solutions to students' absence from class:** Studies have shown that class attendance affects student's achievement when the absence is due to sickness. Many students dodge classes due to different reasons. To improve class attendance mathematics teachers are advised to adopt these strategies in conjunction with Killian (2015) suggestions:

- Be enthusiastic about teaching and learning of mathematics: As a teacher, show the students that you are eager to teach them the subject, show them that you are ready to help them do well in the areas they are finding difficult through your action and word.
- Let the students understand that you care for them: Show them that they are important to you. When students realize that you show interest in their positive performance, they are more likely to attend mathematics classes.
- Enhance your teaching: When students succeed because they are taught well, they are more likely to attend lessons. Do the real teaching as it helps students to genuinely master the material they are meant to learn.
- Motivate the students to excel: Some students miss classes more than others due to some reasons; like students from poor family background, "laissez faire attitude" students etc. As mathematics teacher do not conform to the idea of "that's their attitude, that's their way". You have to inculcate this belief in them that every child has the ability to learn rationally and succeed in school. Push them to do well, increase the standard of your anticipation from them such as their effort, thinking and their results. Reward students for working hard.

### **Having Students of Diverse Abilities in the Class**

Many a times, mathematics teachers have classes with students with diverse levels of ability within the same classroom. This issue may crop up from gaps in basic knowledge or each student's attitude or feelings towards his own ability to learn mathematics. Teachers are to take decisions on how to address the needs of the particular students in their classrooms which is not easy. That calls for proffered solutions. Bremner (2008) and Simanova (2010) came up with some useful strategies for teaching students with diverse abilities in the classroom. The strategies can also be applied to teaching and learning of mathematics. They include among others the following;

- Supportive learning which entails creating classroom whereby students feel confident and able to perform to the best of their abilities.
- Classroom management: when teachers manage their classes effectively they can ensure that learners get involved as much as possible in the lesson. Some of the management techniques include; arranging classroom lay out for maximum learning potentials involving all students, using learners' names, teachers cultivating positive attitude through their own attitude in the class, praise and encouragements, managing learning activities etc.
- Learning to learn which entails teaching students about different learning styles and different learning techniques for visual, auditory and kinesthetic students. Make objective of the lesson available to the students and tell them to review and access if they have achieved the objective at the end of the lesson.
- Bring in variety into the topics, methods of teaching, focus materials and activities. Variety will arouse the interest and motivation, thereby making the lessons accommodate diverse levels of student's levels, abilities and learning styles.

- Group students and allow them to work in groups, pairs and even individually. Change the groupings with time to give the students opportunity to work with different students.
- Teachers should be mindful of the pace of their lesson. They should be aware of their student's abilities and set the pace of the lesson appropriately.
- Teachers should make their lessons interesting in terms of content, topic and activities.

When all these measures are adopted and adapted to by the mathematics teachers, teaching and learning of mathematics would be interesting and enjoyable.

**Issues of Cheating:** Cheating during mathematics lessons and even during test or assignments is very rampant among students. This might be because mathematics is often times reduced to solving problems. It does not involve writing essay like in some courses/subjects. Mathematics teacher finds it difficult to control or determine if the students are cheating. This is a source of worry to the teachers and need to be addressed.

### **Proffered solutions:**

Students can be prevented from cheating in the following ways:

**Banning cheating on test:** The teachers are advised not to allow students to have access to test materials. They should create several versions of their test. Require cover sheets from them. Move students you suspect are cheating. Require desk to be clear. Walk around the room. Don't allow the students to get out of their seats or communicate.

**Banning cheating on homework or other assignments:** As a mathematics teacher, it is advisable to make homework a small part of a student's grade. Have students to show their work. Assign group projects and make them to do presentations of their work. Refuse to accept any homework submitted after corrections have been done.

### **Need for Extra Lesson**

Mathematics teachers commonly are faced with the issue of a lot of demands on their previous and subsequent school time from students who plead for extra assistance (lesson). This issue demands considerable commitments on their own part in various ways to assist these students comprehend and practice the topic being learned. This issue is not all that easy for the teachers to address. They can address that through commitment outside classroom in as much as it takes much time.

**Issue of Homework:** Generally, mathematics curriculum demands day to day practice and reappraisal for proficiency. Consequently, finishing the daily homework or assignments is very vital to learning the material. Sometimes many students do not finish their assignment, some students copy from other students whether correct or not. This often makes those students to strive during test/examination time. To deal with this challenge is sometimes very hard for mathematics teachers.

Marzano and Dabre (2007) provided some research-based home work guidelines to help ensure that homework is appropriate and completed. These guidelines can also help the mathematics teachers to tackle the issues of homework and assignments given to students. The guidelines include:

- Assignment of purposeful homework.
- Ensuring that homework is at the suitable level of difficulty. This enables the students complete the assignment independently with respective high success rates, but should still be a bit challenging enough and interesting.

Careful monitoring of the measure of homework assignment so that it is commensurate with the student's mental capacity. The homework should not take much time away from other home activities.

### **Conclusion**

This paper had discussed the issues of concern to mathematics teachers in general and the ways of addressing the issues. Mathematics teaching and learning can still be exciting if the suggested remedial processes can be incorporated in the classroom. Above all there is the need to address the issue of lack of mathematics teachers in our secondary schools by the appropriate education authorities.

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