

Challenges Facing Teaching and Learning of Science and Mathematics

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Introduction

Teaching and learning of Science and Mathematics can prove to be an arduous task not only to students but also to teachers. This article briefly explains the key challenges facing teaching and learning of Science and Mathematics.

Challenges in teaching and learning of science and mathematics

This part briefly highlights the major challenges facing teaching and learning of science and mathematics in schools. These include teacher qualifications and training, teacher experience, teaching and Learning methods, and teaching and learning materials.

1. Teacher Qualifications and Training

The general performance of pupils in any subject may be attributed to the teacher qualifications and training in the subject. Angrist and Lavy (1998) indicate that, for a teacher to be more competent in his/her field of career, he/she needs to have undergone through some professional training. Therefore, if a teacher lacks that knowledge, it would be a challenge to him/her to teach the subject to the learners.

For an effective teaching of science and mathematics in schools, there is a need for professionally trained personnel (Francis, 2007). This kind of professional training needs a purposely planned programme of study prepared by experts with an approval from a competent authority. This may enable the teachers to find quality training cheaply and locally hence availability not being a challenge.

Untrained teachers are rarely equipped with observation skills and are unable to help notice children if they have difficulties, are not able to provide extra remedial work for the slow learners and do not know that children differ in their rates of understanding the concept and they require remedial varying teaching to meet their individual unique needs (MOEST, 2001). Moreover, it can still be observed that untrained teachers find it hard to plan various teaching objectives effectively.

This is in the sense that if teachers are to improve the teaching of science they must seek first to create enthusiasm among pupils who are going to teach.

2. Teacher experience

Teacher experience is equally important in the teaching and learning process. Years of teacher experience relates positively to the ability of learners to adapt lessons to classroom conditions (O'Connor & Fish, 1998). Some teachers lack experience due to short term training, hence, becoming a major problem when teaching the subjects due to lack of knowledge on the written facts. Bodenhausen (1988) further instigates that if a teacher is more inexperienced and at the same time has low qualification, this lowers the performance of learners in that particular subject and of which can reduce the moral of the teacher hence making it to be a challenge. Thus, lack of experience from the part of a teacher poses a big challenge in the teaching of science and mathematics subject.

3. Teaching and Learning Methods

Apart from the normal routine that is used by teachers in teaching various subjects in schools, science and mathematics requires extra strategies for them to be more interesting to both the students and the teachers. Since science and mathematics is all about real life applications that may assist anyone to handle or solve any problem that may incur, the teaching methods employed by teachers should equally be practical enough. Some teachers when teaching science and mathematics do not take seriously the pupils that they teach, this makes them to be more of reluctant in participating fully in the lessons hence posing a challenge when it comes to teaching of the subject (USAID, 2001).

Interactive and demonstrative methods are highly recommended in teaching and learning of mathematics and sciences. In schools, some teachers use non-interactive methods to teach mathematics and sciences. Due to lack of interaction, the students are not free with their teachers hence making it hard for them to be open and ask questions in certain areas where they are not able to understand.

Another method of teaching mathematics and science is participatory methods. However, many of the teachers lack training to use participatory methods in teaching the subjects. Thus, such teachers end up using lecture method rather than allowing learners to discuss on various topics in science and practice more on solving mathematical problems (Gachuhi, 1999). This makes the class sessions to be dull and not lively. Teachers don't get to understand the mind of their students and to understand as to whether the pupils are really getting what they are being exposed to in the subjects.

Practical method is also central in teaching mathematics and science. Knott (2007) observes that one of the basic methods for teaching mathematics and science is the use of practical approach since the subjects are practical in nature. When teaching mathematics and science, teachers should aim not to teach facts, instead they should aim to teach a skill of application. In spite the fact that practical approach may be of essence to the teaching of science and mathematics, lack of adequate resources and teaching materials may form barriers to teachers while using the practical approach in teaching the subject.

4. Teaching and Learning Materials

In Education, learning and instructional resources are important. They are the primary means through which students gain access to knowledge and skills. Textbooks, instructional materials, equipment, and technology are essential tools in educational system, and they must be provided to all learners (Oakes and Saunders, 2002). Lack of these teaching and learning resources poses a challenge in the teaching processes.

Teaching resources are the primary tools used by teachers to organize their lessons, make content knowledge and skills available to students. These resources contain the contents that learners are expected to learn in their curriculum (Freeman and Porter, 1989). Therefore, teachers are required to carry with them these instructional resources while teaching these two subjects. However, Harris (2002) reveals that shortages of teaching and learning materials leave learners with less knowledge about a subject as compared to those who have adequate resources hence affects negatively the teaching process.

For effectiveness in teaching of science and mathematics, a teacher need need to ensure that there is the availability of enough teaching resources. According to Koski (2001), lack of that may lead to a challenge since there will be lack of references in case of any problem incurred during the teaching process.

Before a teacher gets to class, he/she is required to choose the proper resources to use during the teaching process. Thus, choosing of teaching aids, which do not meet the learning needs of children, is another challenge facing teaching science and mathematics. This is despite the fact that there are many resources that teachers can choose to support the pupils learning. The materials are often inadequate and fail to give each child an opportunity to practice their various skills. Some materials are unattractive for the children to look at, some are not durable, are made of material unfitting for the resource and its use. There are other aids that confuse learners by having too many irrelevant characteristics (Ayers, 1986).

However, teaching does not necessarily require availability of resources to all the pupils so that it can be effective. Teachers are really good in mobilizing the few

resources that they have during class work. Some may write the notes on the blackboard and thus making the knowledge required available to the pupils.

Conclusion

Teaching of science and mathematics in schools depends upon teacher qualifications and training, teachers experience, teaching and learning methods used, and availability of teaching and learning materials. However, individual characteristics of the learner, teaching and learning environment among other factors may equally contribute to teaching and learning of science and mathematics. For a teacher who fails in terms of his/her own training and experience or to use effective teaching and learning methods and instruction materials, the performance of learners may not be assured as such.

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