

25

Dr Kapenda

**THE NEED FOR RESEARCH IN MATHEMATICS EDUCATION IN
NAMIBIA**

**H. M. KAPENDA AND C. D. KASANDA
UNIVERSITY OF NAMIBIA**

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The need for research in Mathematics education in Namibia

H. M. Kapenda and C. D. Kasanda

*Department of Mathematics, Science and Sport Education
University of Namibia*

The meaning of research

A number of definitions of the term 'research' abound. Hitchcock & Hughes, (1995, p.5) define research to 'systematic inquiry'. This inquiry is characterized by sets of principles, guidelines for procedures and is subject to evaluation in terms of criteria such as validity, reliability and representativeness.

According to Cohen, Manion & Morrison (2000, p.3), "research is concerned with understanding the world" (in which we live) and "is informed by how we view our world(s), what we take understanding to be and what we see as the purposes of understanding". It should be pointed out further that research might be viewed as a science requiring logical steps to achieve the goal or as a subject of study whereby individuals teach, the concepts related to research as a subject in its own right. That is as a product or the process or as a subject.

Types of research

Research may be classified according to the methodologies used or the purpose to which it is put. Below we briefly touch on the different kinds of research that mathematics teachers may be involved in.

Basic research

According to Gay (1992) basic research in education is, "concerned with establishing general principles of learning. For example research carried out to find out the effect of punishment and reward in the mathematics classroom could be classified as basic research in the sense that the researcher is trying to find out how these impact on the learning of the subject. Gay (1992:9) further notes that, "in its purest form, basic research is conducted solely for the purpose of theory development and refinement..."

Applied research

Applied research in education is usually carried out for the purpose of using or testing “theory and evaluating its usefulness in solving educational problems” (Gay, 1992:9). When a mathematics teachers tries to find out the effectiveness of teaching methods in order to enhance learning in the classroom s/he is viewed as being involved in applied research. Most education research could be viewed as applied research in the sense that educationists usually want to solve education problems faced in the classroom.

Action research

Gay (1992) notes that the purpose of action research is solve problems through the application of the research method to solve a local problem and is carried out within a local environment. For example, a teacher in a particular school wants to improve learners’ attention during lessons. Such a teacher is regarded as being involved in action research in the sense that the site of the research is local and the problem is only particular to this particular situation and learners. Generalization is not essential.

This paper will focus more on ‘action research’ and applied educational research. Hitchcock & Hughes (1995) view action research as appropriate has for teacher-researchers to adopt because it helps them to become reflective practitioners. Hitchcock & Hughes define action research as; “An enquiry conducted on a particular issue of current concern, usually undertaken by those directly involved, with the aim of implementing a change in a specific situation” (p.6). On the other hand, Neuman (2003, p.25) define action research as “applied research that treats knowledge as a form of power and abolishes the line between research and social action...Action researchers try to advance a case or improve conditions by expanding public awareness”.

The above definitions of action research appear to suggest that this research is an indispensable tool for classroom teachers to reflect about the action(s) taken in the classrooms, about their own practice and about their students’ activities and performance. From the foregoing it is important for teachers to acquire research skills to enable them become better practitioners and hence provide effective instruction to their learners.

When mathematics teachers carry out their own action research, they are most likely to make use of their research findings as compared to the situation when a researcher from outside provides these results. As Tambo and Mukono (2001) noted teachers may not regard the problem carried out by an outsider as a problem worth researching and may question the validity of the recommendations made. This observation makes it imperative for mathematics teachers to carry out a research whose problem they themselves have identified if the results are to be used by them. Tambo and Mukono (2001) quote Tobin (1999) who indicated that involving teachers in research enables them to “grow professionally and improve the quality of the enacted curricula and learning of their students”(Tambo and Mukono, 2001: 3).

Importance of research in teaching and learning mathematics in the Namibian context

Prior to independence in 1990, the ‘bantu’ education system was in place in all non-white schools. This type of education did not emphasize Mathematics and Science subjects. According to Tjikuua (2000, p.1) “...Mathematics and Science Education was predominantly for the whites, which constitute(d) a very small percentage of the population.” As noted by Cohen (1994, p.97), the ‘bantu’ education system in Namibia fostered in the students basic literacy skills in the mother tongue and a utilitarian knowledge of Afrikaans and English. The school syllabus for black pupils put emphasis on manual training, tribal heritage, agriculture, religion, elementary arithmetic and hygiene. To date, Mathematics education in Namibia has not fully recovered from some of these colonial malpractices. A Task Force on ‘Improving Mathematics in Namibia’ (Namibia Human Resource Development Programme [NHRDP], 2002, p. 3) reported that irrespective of the many “projects, papers written, and research carried out in Mathematics and Mathematics education...there has not been a great deal of improvement resulting from these efforts; learners still under-achieved in Mathematics”. The above notwithstanding, the NHRDP task force recommended that more research be carried out to inform mathematics teaching and learning in the country.

Zimba and Kasanda (2001: 4) note that “teachers and policy makers in Namibia have been encouraged to base their practice on empirical evidence”, but decry the fact that most “teachers are mere consumers of research findings and not producers of research knowledge”. In such a situation little can be done to improve the quality of the learning of mathematics in our schools. Therefore, it is important to provide the teachers the necessary skills to do research and be encouraged to do it in their classrooms.

Therefore, generally research tends to provide us with empirical evidence that can be used by policy-makers, practitioners (such as teachers) and other education stakeholders in achieving a number of educational goals and objectives. Some of these include the following:

- Making informed education decisions about the problems or issues faced in the teaching of mathematics. For example, research could be carried out to find out which methods are effective in the teaching and learning of mathematics in our schools? What teaching aids are most effective in teaching a given mathematics topics etc?
- How do students perform in democratic or autocratic mathematics classroom environments?
- Formulating guidelines and policies that will improve the teaching and learning of Mathematics and Science subjects in Namibia.
- What is the effect of teaching aids on the students’ performance in mathematics?
- How is the new mathematics curriculum being implemented in Namibian schools? Etc., etc.

Research may therefore provide a window of what is going on in the mathematics classrooms in Namibia. For example are teachers actually using the learner-centred method or not? If not what are the factors that hinder the use of learner-centred teaching methods in mathematics in Namibian schools and classrooms. Such research will enable both teachers and the Ministry of Education to search for ways in which the situation could be rectified to ensure the use of learner-centred methods. Further, teachers involved

in reflective practice via the use of action research may identify teaching strategies that do not work, why they do not work and what remedial action addresses these problems. In this regard research is providing a way out of factors that hinder performance and provision of quality education to the Namibian learners in the mathematics classrooms.

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Activity for teachers on research

Please identify the problems that you face in the teaching and learning of mathematics in your classes. From these develop research problems that you can carry out to improve the situation or solve the problem.