

Educators' Perception on the Importance of Utilizing Teaching Resources in Grade 9 Mathematics

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ABSTRACT Mathematics cuts across all the fields of human endeavours in its wide application and mind development. Hence, this study focuses on the educators' perception on the importance of utilizing teaching resources in mathematics. It adopted case study research design of qualitative approach. A purposive sampling technique was used to select two learners in a selected high school in East London Education District of South Africa. A semi-structured interview was used to elicit information from the respondents and the data was analysed using thematic approach according to themes from the research questions formulated. The study revealed the efficacy of teaching resources for mathematics and how it helps the educators to achieve their target goals. It also revealed the type of resources available in teaching mathematics. The study concluded that effective teaching of mathematics is through availability of resources and recommended that the school should endeavour to provide more recent resources that are technologically inclined.

INTRODUCTION

Mathematics cuts across all the fields of human endeavours in its wide application and mind development. However, despite its wide applicability, many students still could not find their feet in the subject. Governments and educational systems around the world recognize the need for students to be skilled, creative and confident users of a wide range of Information Communication Technology (Salman 2010), of which the knowledge of Mathematics is required. To acquire the appropriate knowledge and skills required by learners and educators' professional development, mathematics resources have significant roles to play in the authentic application and sustenance of performance in schools.

Ochohi and Ukwumunu (2008) attesting to the profitability of e-learning in Mathematics, posited that it makes Mathematics more interesting, more enjoyable and relevant to students' everyday lives; stimulates students and helps them to understand difficult concepts and become more creative; students acquire a variety of different skills when taught using e-learning tools. Nevertheless, there is an issue. Kwache (2011) stated that, in concrete terms, e-learning enhances teaching and learning through its dynamic interactive, flexible and engaging content. It provides real opportunity for individualized instruction, accelerates, enriches and deepens skills, and engages students actively in learning. As new concepts of learning have evolved,

educators are expected to facilitate learning and make it meaningful to individual learners rather than just to provide abstract knowledge and skills (Adelabu and Adu 2015).

Education is widely acknowledged as a key to the development of every nation. However, this expectation is proving elusive in South Africa due to the fallen standard of education. This decline in performance is notable in subjects like mathematics (DoE 2013). A study conducted by United Nations International Child Education Fund (UNICEF 2005) indicated that South African learners ranked fourth with an average literacy score of 48.1 percent and rated last with respect to numeracy, scoring at 30.0 percent. In 2011, the district (King William Town's) was ranked among the worst performing education districts in South Africa with a percentage score of 58.1 percent.

The situation at the grade nine levels is not different from the performance at the Matric level. The average performance of grade nine learners in mathematics in 2014 for instance has dropped to 10.8 percent (ANA 2014).

The South African Democratic Educators Union (SADTU 2013) lays the blame of poor performance in mathematics by high school students on the attitude of the students towards the subject. While ANA (2014) holds the view that the policies put in place by government in the teaching and learning of mathematics is not helping the students. Educators are also to be blamed for this dismal performance in mathe-

matics in the country as well as unavailability of teaching resources for mathematics in high schools. As a result, in 2014 the final stage of the incremental implementation of the CAPS was completed in the Senior Phase in Grades 7, 8 and 9. CAPS therefore, provided stability in the sector by giving educators clear guidelines on content, pedagogy and assessment in influencing learner performance in these phases which is yet to be achieved.

Research Objective

This study tends to investigate the views of educators on the importance of using teaching resources in Grade 9 mathematics.

Research Questions

1. What are the educators' perceptions on the effect of utilizing teaching resources in Grade 9 mathematics?
2. Which teaching resources do educators use in teaching mathematics and why?
3. How important are these teaching resources in teaching mathematics?

Literature Review

Importance of Teaching Resources in Mathematics

Ornsten and Hunkins (2014) said assets and other relevant resources are required to support all school programs to be successful. It is also important for the provision of human support in terms of application of the activities to be learnt by learners in mathematics. Schools cannot operate without teaching resources like Games and Puzzles, Graphs and Charts, Bulletin Boards and textbooks that contain appropriate examples and photo-copiable illustrations like census at school forms, the newspapers, and magazines that have reports relating to mathematics. As one of instructional implications of Piaget's theory of cognitive development is that "learners are required to keep occupied by assigning them with "rich environment that allow for active exploration and hands-on activities" (Sorto and Sapire 2014:15), in order to keep learners attentive, educators should capture learners' attention through the use of appropriate and inspiring

teaching materials/resources (Sorto and Sapire 2014).

The Department of Education has tried to solve the problem of inadequate learning and teaching resources by providing schools with funding through the granting of schools section 21 status, which allows schools to be given finances to purchase their required material/resources by themselves. In some schools educators were supplied with textbooks by the Department of Education that could not be used by them as they did not contain the relevant content for the learners (Sorto and Sapire 2011).

Teaching Resources and Educator Productivity

South Africa has one of the highest rates of public investments in education in the world. Money is spent more on education than any other sectors. Government spend billions on education, yet, there are shortages of teaching resources most especially text books. Government spending on basic education during 2015/16 is estimated at R203 468 billion (SA Government 2012). Good teaching resources are excellent teaching aids. They are resources for both educators and learners.

Research has shown that learning and teaching aids are needed to help educators conduct a conducive lesson within classroom especially with the use of textbooks and visual aids. Educators can only produce adequate and successful lessons when aided with resources that are adequate. Government as well as education officials have lost the passion and beauty of education due to shortage of teaching resources not only for mathematics teaching but for all subjects at different levels. Many schools have resources bursting at their seams while others make amends with the little they have and the little that is provided by the government (SA Government 2012).

The department of education distributes more than 50 million workbooks and other teaching resources as part of commitment to improve literacy skills of learners. Workbooks have been made available, but some schools have not received them. This has caused interruption that led to inadequate and insufficient learning and teaching in the classroom, this in turn causes a decrease in literacy, reading and writing academic result (Starr 2015).

Learners feel incompetent when they do not have the necessary means, materials and resources to learn in the classroom. This leaves learners feeling despondent and discouraged by the whole idea of enjoying school. Educators then find it difficult to encourage and motivate learners by using other strategies to alleviate the absence or insufficient supply of teaching resources. This then makes the job of an educator increasingly challenging as they not only have to conduct a practical and realistic lesson using scarce teaching resources but also need to keep learners inspired to take pleasure in learning new ideas and concepts in the classroom (Starr 2015).

According to Starr (2015), the aforementioned problems necessitate parental involvement in partnership with the government to fill the gap by providing some affordable teaching resources for their children. She said parental involvement is more important to the success of students at every grade level; educators have to involve families into their children's education by encouraging active parent participation in student learning (Starr 2015).

Educators play an important role in education sector. It was widely believed that there is no nation greater than the quality of her educators. For education system to achieve the desired goals and objectives, educators' efficiency must be taken into consideration. The efficiency of the teacher lies on the availability of teaching resources used by the teacher. The future of any educational level depends not only on the psychological factors but adequate teaching resources in schools (Adu et al. 2012). Educators' roles on students' academic achievement cannot be over-emphasized. The educational attainment of students depends on the efficiency of educators in using the instructional materials (teaching resources).

When educators' productivity decline, it has a correlation to the standard of education both short term and long term. Educators exert a great influence on students, the students look up to them for guidance, support and protection. Children are supposed to learn from them informally by observing their attitude, mannerism, conduct and general behaviour, and formally through their teaching in the classrooms. That is why Adu et al. (2012) points out that the things to do to make educators work hard for the interest of the school and themselves are fundamental to sustainable development in educational sector.

There is evidence (Ilori 2015) that if issues of teaching resources' availability are not considered they can undermine commitment to teaching.

Anyanwu (2012) contends that educators, like people in the industry, are affected by their experiences. No matter what, the zeal of the educators to put in their best can be hampered by many by unavailability and underutilization of teaching resources. These factors are referred to as educators' commitment to work life (Adu et al. 2012). The quality of work has significant effect in teaching and learning as well as educators' social interaction within and outside the school environment. According to Bharathi et al. (2011), the quality of resources and the relationship a teacher has with these resources will determine his or her job satisfaction as a result of improvement in learners' performance.

Adequate Teaching Resources and its Impact on Teaching and Learning Process

Research done by Mwong and Wanyama (2012) revealed that teaching and learning materials not only enhance a child's acquisition of skills but also ensures that the transition from pre-primary to primary school is smooth. This means that all the education stakeholders should ensure that the teaching and learning materials are available in schools so that learners at primary schools will be able to identify things and help them in their teaching and learning.

Onyango (2014) suggested that educators should use variety of teaching resources easily found within the locality, even though it is the education stakeholders' responsibility to provide the resources for teaching and learning. He noted that the educator is the main source of teaching and learning materials in that he/she initiates their provision in the centres like, involving the children in the material collection. In all, parents and the community as a whole get the role of being resource donors to their children education.

Kibuuka (2010) was of the opinion that availability of teaching resources encourages understanding rather than rote learning. When educators fail to use the resources, it is possible that rote learning will be the order of the day. Learners only master concepts without in depth understanding. With the use of teaching resources, learners relate what they learn with the real life aspects. Teaching resources enable learners

to open up their minds and explore their inspiration as well as their wide range of thinking.

According to Karaka (2009), use of concrete teaching resources assist in the development of five children's senses. This reduces the monotony of the teacher using only one material to enhance learning. Teaching resources can assist the learner to learn and acquire new knowledge. Aids such as charts, pictures can enable a child to learn and remember the concepts learnt. The classroom should be well organised and be spacious for free movement of learners and educators to access materials and enable the teacher to pass around assessing the learners' activities and motivate them. He concluded and said that equipment needs to be installed and fixed in a stationed place where learners can access them.

METHODOLOGY

Research Approach

The research approach used for this study is qualitative approach. Qualitative approach is appropriate for this study as it is suitable to provide the researcher with the responses to the questions in this study. The researchers attempt to gain a clear understanding of the situations which learners deal with when making choices. Litchman (2013) emphasizes that qualitative research is concerned with conditions or relationships that exist, beliefs and attitudes that are held, effects that are being felt and trends that are developed.

Research Design

Research design is a plan outlining how the researchers will explore the topic. This study adopted a case study research design. Creswell (2014) posits that a research design is the blueprint, a detailed plan, a map of the various elements of research and how they relate to each other. This study views the research design as the framework that details how a researcher intends conducting his/her investigation (Litchman 2013).

Sample and Sampling Techniques

Population is defined as the universe of elements from which sample elements are extract-

ed. The population is also the group of elements to which we want to generalize the result of research (Yin 2011). The sample that was purposively selected for this study consisted of two educators in one school from East London Education District.

Data Gathering Instruments

The instrument used for collecting data is semi-structured interviews. The aim of the qualitative approach during the interviews is to ascertain the educators' perceptions on the importance of teaching resources for mathematics. A semi-structured interview, also known as the non-standardized or qualitative interview (Creswell 2014), is a hybrid type of interview which lies in between a structured interview and in-depth interviews. Semi-structured interview was ideal for this study since it enables the production of in-depth data by getting first-hand information in this case on the importance of teaching resources for teaching mathematics (Litchman 2013).

Data Analysis

Qualitative analysis is a systematic process of selecting, categorizing, comparing, synthesizing and interpreting to provide a description of the phenomena of interest (Litchman 2013). The data was analysed using tape recorded responses from different respondents interviewed which were later transcribed. After transcribing, data was categorized into themes. The data collected from the respondents was analysed using thematic approach of developing themes from the research questions after transcribing and coding it. These results are shown below.

RESULTS AND DISCUSSION

Table 1 shows the demographic data of the respondents.

Table 1 shows the profile of the two educators purposively selected for the study. It consists of one male and one female (gender sensitivity). Their age ranges are different but teaching at the same class.

Types of Resources for Teaching Mathematics

According to the respondent A, (Educator)

Table 1: Respondents' profile (Educators)

Respondent	Age	Gender	Teaching experience	Highest qualification	Grades teaching
R1	42 years	Female	13 years	Bachelor of education	9
R2	38 years	Male	8 years	Bachelor of education (Honours)	9

Teaching becomes boring to me without using teaching resources, so I use different textbooks, from different authors for them to get understanding.

When asked if she knows any other resources and if she uses them, she said,

Yes, other resources I use in my teaching of mathematics is Internet. I use Internet when the topic is not flexible, for me to get more ideas, and to make it fun.

According to respondents B (Educator)

She is aware of graphs, charts, shapes, posters, videos, bulletin boards, games and puzzles, magazines, real object analysis and television etc. but real object is very compulsory, after writing it you need to show them and need to see it visually for example, when teaching shapes, patterns- you need sticks, beans to make patterns for them to practicalize what is been taught in the classroom.

When asked if she knows any other resources and if she uses them, she said,

I use different type of teaching resources in mathematics; they are calculator, textbook, computer, posters, ICT

The two respondents alluded to the fact that there are many teaching resources used in class while teaching mathematics and according to ADEC (2013), educators use a wide range of stimulating and exciting materials to teach the concepts outlined in the curriculum to ensure that learners are actively involved in their learning. That these resources allow the instructional space to be flexible, and make students' activities and learning to be more visible.

Importance of Using Teaching Resources In Mathematics Class

According to the same respondent, (Respondent A) teaching resources:

helps the learners to grasp the concepts, to have more interest and knowledge in the particular topic teaching in mathematics and It makes them to have more in-depth in my class,

lesson became so easy when using teaching resources in my teaching.

While respondent B says:

These teaching resources are just like sugar in tea, that make it enjoyable and effective; Other thing is that, it really makes my teaching so easy and interesting, and it motivates learners to be active in the lesson. It also makes lesson delivery content so clear to the learners and they do have clear understanding most especially when resources like ICT devices, such as E- learning and internet are used whereby what needed to know has been programmed in the devices. It enables me to manage the time or period in a particular lesson.

The two respondents (educators) emphasize the importance of using teaching resources in mathematics class; they are of the view that when using the resources, the lesson delivery is clear and less cumbersome. These findings are in line with Ilori (2015) that says if issues of teaching resources' availability are not considered they can undermine commitment to teaching. Sorto and Sapire (2014:20) support these results by citing that "In order to keep learners attentive educators should capture learners' attention through the use of appropriate and inspiring teaching materials/resources."

The Effect of Using Teaching Resources in Grade 9 Mathematics Class

Concerning the effect of using teaching resources to teach mathematics,

Respondent A says:

What I noticed was that when I use complete teaching resources, I always see good result when evaluating them at the end of the lesson. When I use teaching resources they understand better than when I did not use teaching resources in mathematics class.

While respondent B says

Most of the time, end result showed the understanding of the learner. That is, at the end of the lesson when I assess the learners by giving

them class activities, whether in oral or in written forms, I always notice that they normally perform very well than when I did not use any teaching resources

This is in line with Anyanwu (2012) who contends that educators, like people in the industry, are affected by their teaching experiences. No matter what, the zeal of the educators to put in their best can be hampered by unavailability and underutilization of teaching resources. Similarly, Adu (2015) was of the same opinion that one of the factors that can enhance educators' job performance and productivity apart from organisational climate is the use of teaching resources. According to him, availability of teaching resources promotes effective teaching and learning which will in turn lead to good academic performance.

CONCLUSION

The findings showed that the use of teaching resources in mathematics is very important to facilitate effective teaching and learning, it promotes learner's performance and removes mathematics phobia from learners. The study also revealed that educators are well satisfied with their teaching when there are available resources. Learning environment becomes more fascinating and conducive when the educator interacts effectively with teaching resources for mathematics.

RECOMMENDATIONS

The researchers recommended the following:

The schools should update the resources for teaching mathematics and try to be creative with the introduction of information and communication facilities in this 21st century. Educators too should try to use contemporary examples to promote effective teaching and learning mathematics since according to the learner "what they see, they remember".

Educator must know that what they prepare may not be of any importance if they do not enable the learner to learn. If teaching resources are displayed well, they pre-occupy the learners when the educator is not in class and this will enhance learners' learning in the absence of the teacher. This can be done by displaying on walls, hangings, mobiles, soft boards using pins, placed on shelves and learning centres like shop

corners, curiosity tables among others from this perspective, learners should be allowed to learn through discovery and make their own conclusions. They should be allowed to solve their own problems while in groups' manipulation materials which will boost their self-esteem.

There should be a close collaboration between parents and educators to ensure that some expensive resources are provided to learners.

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