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DEVELOPING STUDENTS' MATHEMATICS PROBLEM SOLVING SKILLS, THE CASE OF MATHEMATICS FIRST YEAR STUDENTS IN WOLKITE UNIVERSITY

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ABSTRACT
The objective of this research study was developing students' mathematics problem solving skills. Quantitative and qualitative designs were used. Purposive sampling approach was used to select study population. Questionnaires were administered to the study population in order to collect the data for the study.
The research findings showed that some of the problems were students' poor skills to identify and use appropriate mathematics problem solving strategies and mathematical keywords or indicators, to put connections among mathematical concepts and procedures as well as mathematical ideas with different real world situations, to transform givens in to solutions. It was found that the problems are multifaceted and accordingly the solutions require overall effort from all concerned stakeholders.

Keywords:
Problem solving strategies, subject matter knowledge, problem solving skills.

INTRODUCTION

Mathematics is the aggregates of mathematical problem solving, and theoretical knowledge. Problem solving is the process through which required solutions for a given solving as ''a process of moving from a given state to a goal state with no obvious way to progress from one state to the other state'' (mathematical problem solving encompasses the use of knowledge, skills and strategies to solve problems''. The ability to solve and justify problems is the ultimate goals of mathematics''. The mathematical processes that support effective learning in mathematics include problem solving, and reasoning." The prominent and powerful tools for a person to have good skills in solving mathematical problems, which are marked by different investigators, are the general problem solving strategies, ability to identify key words during mathematical problem solving, use of appropriate diagrams for mathematical problems solving, use of worked examples for the development of problems solving skills, ability to personalize and relating mathematical problems with real word experience, language and culture similarity in the learning of mathematics, students' positive attitude towards mathematics and use of technology for mathematical problem solving, (Agizew, Kassahun Tesfaye et al., 2018 G. C). The core study of this research is thus, developing students' mathematical problem solving skills.

Statement of the problem

Problem-solving strategies are what we do in our heads as we make sense of and solve problems.' They are our tools for simplifying problems and revealing the possible paths to solutions'. Developing students problem-solving abilities can be a challenging task. Building problem-solving skills through the teaching of strategies requires attention to building mathematical skills and the thinking process. One of the most commonly referenced approaches to problem solving involves the use of keywords. This also has been described as direct translation. Students are taught to look for particular cue or indicator words in their word problems. The typical strategy is to search for a keyword information such as ''more'' which can sometimes mean ''to add', and use this information to directly translate the problem into its computational form. It is, of course, also easy to write story problems with key words alone, that suggest incorrect operations for the problems. Problems related to learning Mathematics are common Phenomenon among students around the world. This holds true in the Ethiopian context too. As Mathematics teachers in University, we had the opportunity to observe closely the overall competencies of students in mathematics problem solving skills, which is unsatisfactory. These initiated us to do research on the problem.

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Objectives of the study

- Developing students' mathematical problem solving skills.

Materials and Methods of the study

Research Design

- Quantitative and qualitative designs were used, (Agizew, Kassahun Tesfaye et al., 2018 G. C).

Methodology of the study

Study population

The study population was mathematics first year students in Wolkite University.

Sampling Technique

- Purposive sampling technique was used for selection of the study population.

Sample Size Selection

- The entire population of mathematics first year students in Wolkite University.

Tools of data collection

Questionnaires were used to assess students' background about using important and relevant inputs for solving mathematical problems. General Information concerning about students experience in solving different type of mathematical problems in the classroom. So, the researchers designed questionnaires/ Likert Scale for the students to obtain the information. The main reason why the researchers used questionnaire/Likert Scale was that the researchers believe that the questionnaire/Likert Scale enables students to explain their lived-in-it experiences about the study, (Agizew, Kassahun Tesfaye et al., 2018 G. C).

Procedures of Data Collection and Techniques of Data Analysis

The first step in this process was administering questionnaires for the students to get information about their mathematics background, mathematical feeling, and family support for developing important mathematics skills etc. This was planned to collect relevant information about their instructional approach and general experiences in mathematics learning. To analyze the data statistical method of data analysis (SPSS) was used. In the data analysis three procedures have been considered. The first procedure was organizing the collected data based on the items of the questionnaires. The second procedure was presenting the data using SPSS. The third procedure was analyzing and interpreting, (Agizew, Kassahun Tesfaye et al., 2018 G. C).

Results and Discussions of the study

Descriptive analysis

Note that: SA = strongly agree, A = agree, U = undecided, D = disagree, SD = strongly disagree

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Statement on attitude and self-confidence versus student's response

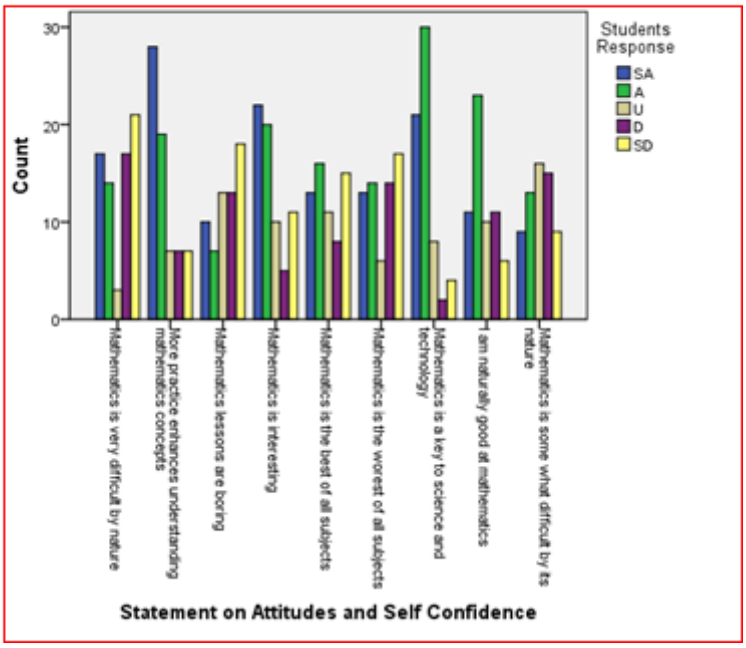

Figure 3.1: Vertical Bar chart

The result of the descriptive analysis from figure 3.1 indicates that the students have attitude problem towards mathematics subject.

Teaching Resources * Frequency of Teaching resource used

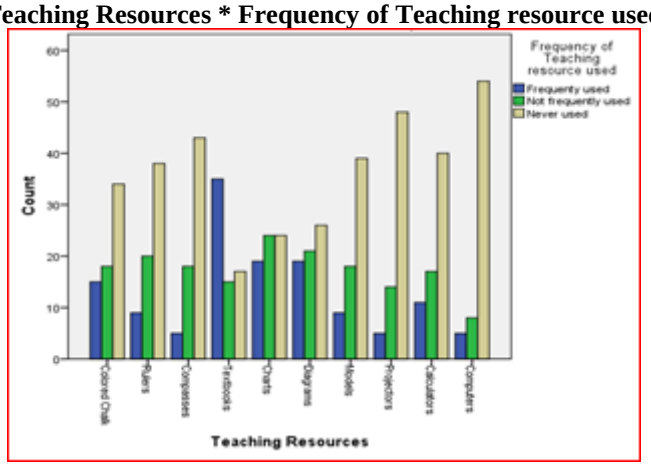

Figure 3.2: Vertical Bar chart

The result of the descriptive analysis in the Vertical Bar chart in the figure 3.2 indicates that except text book materials like colored chalk, rulers, compasses, charts, diagrams, models, projectors, calculators and computers are not frequently used. This indicates that only text book is frequently used for learning and teaching process.

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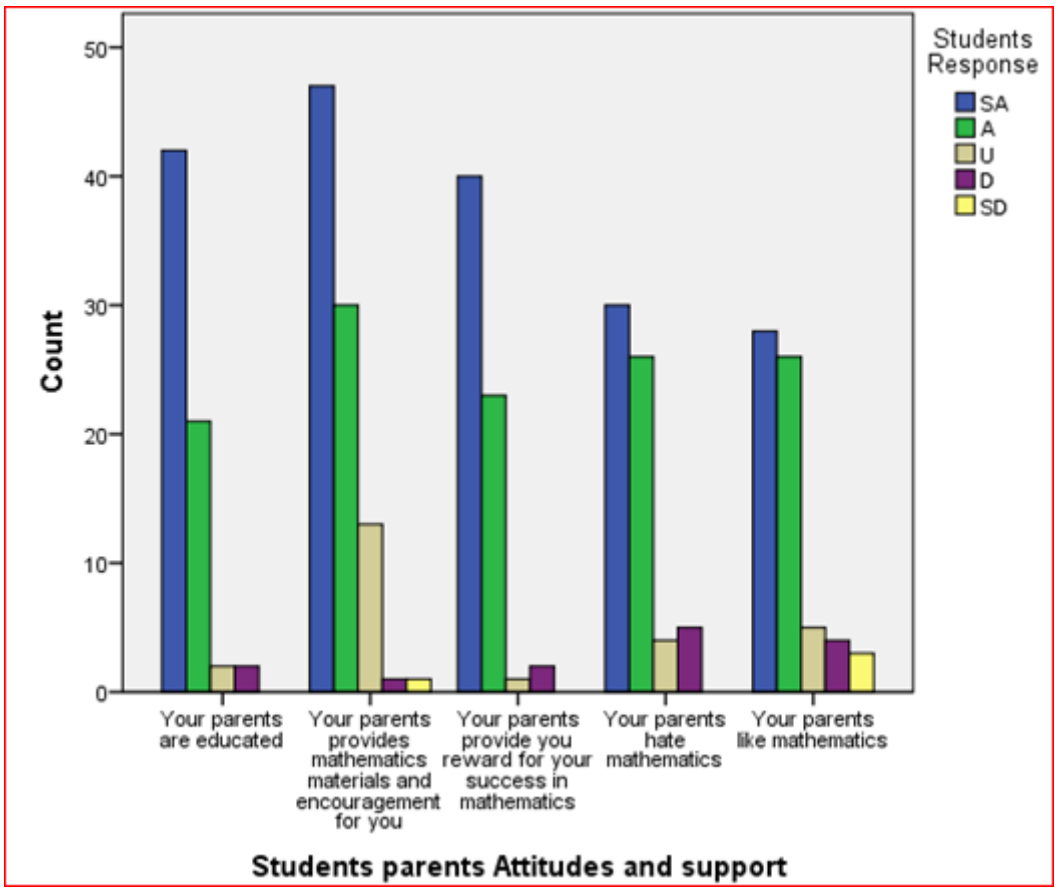

Figure 3.3: Vertical Bar chart

The result of the descriptive analysis in Figure 3.3 shows that student's parents are educated, but there is attitude problem towards mathematics subject among students' parents. The results also show that students' parents provide reward for their children for their success in mathematics subject.

CONCLUSION

The main objective of this study was developing students' mathematical problem solving skills. The study was based on the primary data collected from the study population.

Based on the descriptive result analysis, this study conclude that there is shortage of materials like computer, projectors, compasses, charts, and models in the University but there is no shortage of text book based on the data.

This study also concludes that there is attitude problem towards mathematics subject that mathematics is very difficult and its lessons are boring by its nature.

The result of the descriptive analysis also shows that student's parents are educated, but there is attitude problem towards mathematics subject among students' parents. The results also show that students' parents provide reward for their students for their success in mathematics subject.

Recommendations

Materials like computer, compasses, rulers, models and charts should be fulfilled in the University to improve students' mathematical problem solving skills. The University should continue in this way to improve students' mathematical problem solving skills because this way of teaching and learning process is good way of teaching intervention methods. To improve students' mathematics skills more, the University should work on attitude and self-confidence of the students towards mathematics subject.

Students' parent should have good attitude towards mathematics subject so as to encourage their children towards mathematics subject.

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