# The Effect Of Teacher's Instructional Methods On The Learners Academic Performance In Mathematics Subject In Secondary Schools, A Case Study Of Buwesswa Secondary School In Manafwa District 

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#### Abstract

The focus of the research was to figure out how various instructional strategies affected students' academic performance when learning mathematics at Buweswa Secondary School in Manafwa District. The three main goals of the research were to: determine the impact of teaching strategies on students' academic performance in mathematics; describe the various strategies used in teaching mathematics; and propose some efficient strategies for secondary school courses. The researcher combined both qualitative and quantitative data management strategies with a descriptive survey design. The study relied on a sample size of 220 respondents chosen from teachers and students at Buweswa Secondary School utilizing a purposive sample and simple sample selection procedures. The material was produced by the researcher using data collection techniques such as questionnaires and interviews. Using the SPSS application, the data was evaluated to assess its reliability and for data analysis. According to the researcher's study, the following conclusions were drawn: bad math performance is a result of the characteristics of math teachers, including their methods, attitudes, expertise, training, and access to teaching resources. A student's interest, attitude, expectations, and sense of discipline are among their traits. They are also influenced by their parents, teachers, and peers. Average class size, the quality of the math facilities, and the math teachers are all characteristics of the school. Conclusion, Activities for teaching and learning should guide students towards to the desired learning outcome. This is dependent on the teaching strategy the teacher employs. To avoid boredom and to increase engagement, the teacher should approach the subject while the pupils are focused and engaged. Beginning lessons from the known to the unknown will help students quickly understand the subject matter. Near the authors are the respondents from Buwesswa Senior Secondary School. According to their views, teaching methods contribute in a greater extent to poor performance in mathematics.


Keywords: teacher's instructional methods and academic performance

## Background information

Since mathematics has a broad range of uses across many different fields and disciplines, it has always received significant attention in schools. Moreover, student math achievement has frequently been the subject of attention and is widely seen as a big global problem. In addition to being regarded as a difficult topic, problems with math have also been linked to students' lack of control over their learning.

Self-regulation is a comprehensive concept that includes the before to, during, and post-learning phases (Wolters, 2010). Students are greatly impacted by the education system's and its delivery techniques' quick changes. Due to this circumstance, kids must learn efficiently and with greater self-direction (Winters, Greene \& Costich, 2008).

To achieve this, teachers are encouraged to use a variety of teaching methods when teaching mathematics. This leads to student motivation which is a very important element in the learning process as it is an inducer and propeller for one to do a task successfully. Therefore, motivation is essential for an individual to successfully face challenges in academic setting.

Also, students will ascribe or use motivation as a factor of their behavior in terms of learning and performance. Students' capacity to deal with the challenges of daily school life will be influenced by their behaviors that are linked to their academic motivation, such as their desire to complete challenging work and persist longer in difficult conditions (Masaali, 2007). Despite teachers using a variety of techniques, it has been noted that arithmetic achievement is still dismal. This study aims to look into how different teaching strategies affect secondary school arithmetic instruction and learning.
It has been heavily emphasized how well students around the world perform in math and scientific classes; this is due to information is used so widely in fields like medicine, pharmacy, and agriculture. Several diseases that formerly posed a serious risk to human

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life have been eliminated thanks to medical knowledge. Ergo, with industrialization having a considerable impact on the economies of most nations and production in terms of manpower output, man has been able to keep his health. Although the creation of computer and their widespread use has been a major step forward for technology, understanding mathematics is essential for computers to function properly.
Also knowledge of mathematics is applied of weapons thus enabling the development of some lethal weapons for wars. Education is designed to achieve a specific national goal aiming at attaining full industrialization but if the goal is to be achieved, it means better performance in mathematics

## Problem statement

Experience has demonstrated that the performance of Ugandan students in mathematics is concerning. According to the website of the Uganda National Examination council ( neco Board (UNEB), candidates have historically received zero marks in mathematics throughout national exams. According to UNEB, there are a number of aspects that have a role in the learning of mathematics, with instructional methods being one of them. The mathematics performance has not improved for years despite a variety of teaching strategies that can be categorized as teacher-centered and learner-centered.

It has been noted that there has recently been a significant amount of advocacy for the use of a range of teaching methods in the teaching and learning of many subjects, particularly mathematics. Despite all of this work, however, nothing has been accomplished in mathematics in terms of test-day grades. The fact that the subject is still difficult for students prevents them from obtaining higher grades. In light of this, the researcher wanted to see the effects of the employment of various techniques that might contribute to students' subpar mathematics performance.

## Specific objective

Specifically, the research is designed to:

1. To identify the various teaching methods that are used in the teaching and learning of secondary school Mathematics
2. To examine the effects of using various teaching methods in teaching and learning of secondary school Mathematics
3. To establish teaching methods that are more effective in the teaching and learning of secondary school Mathematics

## Research questions.

1. What are some of the effects of teaching methods to learners in mathematics subject?
2. Explain some teaching methods in mathematics subject?

## METHODOLOGY

## Research Design

This study was using a mixed research design. According to Mugenda and Mugenda (2003), mixed methods research is a type of study in which an individual researcher or group of investigators combines aspects of qualitative research methods (e. g., use of quantitative and qualitative viewpoints, information gathering, analysis, and inference techniques) for the general goals of breadth and depth of knowledge and corroboration. While creating a mixed methods design, there are a number of key factors that need to be taken into account. Expanding and strengthening a study's results and, as a result, adding to the body of published literature is the overarching purpose of mixed methods research, which combines qualitative and quantitative components.

In the study we used quantitative methods to present data in form of tables, pie charts and graphs. This was used to analyze data collected by use of questionnaires, more especially data collected through close-ended questions. For open-ended questions and interview, the researcher was used qualitative methods to analyze the data.

## Study population

Mugenda and Mugenda (2003) describe study/target population as the population to which a researcher wants to generalize the results of a study and should be defined according to the study. The researcher used cross sectional survey of the population that included: Mathematics teachers in the school and students who take Mathematics.

## Determination of the sample size

Amin (2005) suggested that sampling is important in picking components from a population in such a manner that case studies selected represent the population, hence a sample was employed to avoid unguided generalization. The participants in this study will come from Manafwa district's Buwesswa secondary school. Teachers and students of mathematics will make up the sample size. Knowing Strength and Rules of Thumb for Selecting The sample by Christine and Betsy will serve as the sample's guidelines (2007).

Table 1 below shows the summary of the sample size which was considered in the study

| GROUP | NUMBER |
| :--- | :--- |
| STUDENTS | 200 |
| TEACHERS | 20 |
| TOTAL | 220 |

## Sampling techniques and procedure

Sampling refers to the act, process, or methods of choosing a representative sample in order to ascertain the characteristics of the whole population. According to Koul (1990), the easiest and most typical method of distributing sample units across stratum is in proportion to the number of the strata. Stratified random sampling, according to Kombo and Tromp (2006), entails splitting your population into homogenous subgroups and taking a simple random sample in each subgroup. Purposive sampling and simple random sample were both methods the researcher to use. The term "sample random sampling" describes a method of choosing where every member of the designated population has an equal and unbiased chance of being chosen.

The purposive sampling will be used to select the 20 Mathematics teachers from the school. This technique, according to Gay (1996) though may not necessarily be a representative sample; but enables the research to acquire an in-depth understanding of the problem.

## Data Collection Methods

The researcher intended to employ the data collection methods below:

## Questionnaire surveys

This will entail writing open-ended and firmly shut questions that will be given to math teachers. Both open-ended and closedended questions will be created by the researcher; open-ended questions will give respondents the chance to provide their own answers, whilst close-ended questions will present the answers for them to select from.

This method was used since it has a broad coverage area and can concurrently contact a large number of responders. When an open-ended questionnaire is used, it will enable respondents to provide their own responses to the study.

## Interview

The researcher and respondents participated in question and answer sessions in person for this. The researcher will prepare an interview guide and use it to verbally question respondents. This was chosen because in-person interviews produce immediate responses. This is based on the notion that face-to-face techniques are extremely significant for reinforcing the confidentiality clause because they use the interview as a pipeline for obtaining and conveying information from the interviewee to the interviewers (DeVos, 2001). After conducting group interviews with the students, the researcher will hold focus group discussions (FGDs).

## Data collection instruments

The following data collection instruments was used during the study:

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## Questionnaires

The researcher intends to develop the questionnaire in line with the study objectives and the respondents are expected to answer the questions as per the guidelines given. The questionnaires for the teachers will consist of three sections. Section one on the demographic information including gender, professional and teaching experience. Sections two and three will focus on the classroom practices.

## Data Analysis

Based on the goal and purpose of the study project, the acquired data were analyzed. To answer the research question, the researcher combined qualitative and quantitative methods. Microsoft Tables were utilized to present the quantitative data that was analyzed from the closed- and open-ended questionnaire questions. Open ended research instrument questions will yield qualitative data that will be arranged in patterns and themes classified through analysis, and then presented in tabular forms with narratives.

## DATA ANALYSIS

Population of respondents

Table 1: Sex and Gender

| Gender status | Number of respondents | Percentage (\%) |
| :--- | :--- | :--- |
| Boys | 120 | 54.55 |
| Girls | 77 | 35 |
| Female Teachers | 8 | 3.63 |
| Male Teachers | 15 | 6.82 |
| Total | 220 | 100 |

## Source, Primary data:

The youngest category was falling between 13-15 years, $16-20$ and the oldest were $24-50$ who Were teachers. The table below shows the age structure

Table 2: Age structure

| Respondent Age group | Number of respondents | Percentage (\%) |
| :--- | :--- | :--- |
| $13 \_15$ | 150 | 68.2 |
| $16 \_20$ | 50 | 22.7 |
|  |  |  |
| $24 \_50$ | 20 | 9.1 |
| Total | 220 | 100 |

## Source, primary data.

150 respondents $(75.5 \%)$ were students with no distinct qualification as they were students of Buwesswa secondary school. 16 teachers had Diploma and only 4 respondents had degree.

Table3: Showing Education Background (Qualification)

| Education | Number of respondents | Percentage (\%) |
| :--- | :--- | :--- |
| Senior one | 30 | 13.6 |
| Senior two | 50 | 22.7 |
| Senior three | 10 | 4.6 |
| Senior four | 60 | 27.3 |
| Senior five | 15 | 6.8 |
| Senior six | 35 | 15.9 |
| Diploma teachers | 16 | 7.3 |
| Degree teachers | 4 | 18 |
| Total | $\mathbf{2 2 0}$ | $\mathbf{1 0 0}$ |

The summary of Questionnaire Findings According to Objectives stated.

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## Impact of teaching methods on academic performance in mathematics

Table 4: Showing Analysis of data related excellence and Qualification of teachers

| Academic professional qualifications | Number of teachers | Percentage (\%) |
| :--- | :--- | :--- |
| Diploma teachers | 16 | 80 |
| Degree teachers | 4 | 20 |
| Post graduate teacher | 0 | 00 |
| Total | 20 | 100 |

## Source, primary data.

Whenever asked to list their preferred methods of instruction, teachers chose 16 to use demonstrations and methods and 4 to use lectures and group discussions. The majority of respondents ( $70 \%$ ) agreed that there is an impact on kids' academic performance, while $30 \%$ disagreed. The following were the justifications offered by those who said yes: the approach should be carefully selected to support the intended learning objectives.

More importantly, the teacher should build their instruction on their students' prior learning and should prioritize tasks that help students connect what they have learned to real-world situations. Also, a teacher should proceed from the known to the unknown; yet, some choose subjects about which the pupils have no prior knowledge, leading one to the conclusion that teaching strategies have an impact on students' academic achievement in mathematics. Two math instructors have a combined teaching experience of seven years when it comes to effectively imparting mathematical concepts. They may have picked up and learned different teaching techniques needed to help students do better. The argument is that instructors have experience, and that experience may not be a factor in bad mathematics achievement.

Most of the student respondents noted that their mathematics teachers are very boring in class, some never involve their students even by asking questions, they just lecture us in confusion, and others say that their teachers do not give work especially in mathematics subject when it reaches time of exams when things are new.
.Some respondents say that some teachers are not audible in class, they don't use simple language.

## Resources and approaches/methods necessary in the proper teaching and learning of mathematics

All respondents agreed that resources are very important for proper teaching and learning of
Mathematics in Buwesswa secondary school.
Students were requested to indicate the number of students who shared context books in

## Table below shows the response

Table 5: Showing Responses on sharing learning responses

| Class | Response |
| :--- | :--- |
| Senior one | One among 8 |
| Senior two | One among 6 |
| Senior three | One among 4 |
| Senior four | One among 2 |
| Senior five | One among 5 |
| Senior six | One among 3 |

## Source: Primary data.

The figure in the table above indicates majority of the students, constituting more than $40 \%$ of
The students who share one text book between many thus it's an indication that there aren't enough mathematics text books in the school which further contribute to the poor performance on both mathematics in the school. Respondents were asked whether lack of mathematics resources contribute to poor performance and the following data was collected.

Table 6: Showing Lack of mathematics resources on poor performance

| Opinion | Number | Percentage (\%) |
| :--- | :--- | :--- |
| Strongly agree | 120 | 54.5 |
| Agree | 40 | 18.2 |
| Not sure | 10 | 4.5 |
| Disagree | 30 | 13.6 |
| Strongly disagree | 20 | 9.1 |
| Total | $\mathbf{2 2 0}$ | $\mathbf{1 0 0}$ |

The lack of mathematics teaching and other learning materials, according to $65 \%$ of the student samples, is a factor in pupils' subpar arithmetic performance. This \% is a huge amount. Nonetheless, $25 \%$ of the sample believed that poor performance in mathematics was a result of a lack of learning resources (textbooks).

The majority of participants noted that in addition to the textbooks that are required in the classroom, other resources like libraries, school clinics, school environments, restrooms, dining facilities, and recreational facilities, among others, have an impact on learning and performance outside of the classroom. According to $87 \%$ of the respondents, while these resources are present at their school, there is a need for more and/or better ones.

## Factors influencing academic performance in mathematics subject.

The respondent's views about the facilities affecting academic performance in mathematics can be summarized as in the table below
Table 7: Factors influencing academic performance in mathematics

| Factors | Frequency | Percentage (\%) |
| :--- | :--- | :--- |
| Attitude | 35 | 15.9 |
| Environment | 20 | 9.1 |
| teaching methods | 110 | 50 |
| Other factors | 55 | 25 |
| Total | $\mathbf{2 2 0}$ | $\mathbf{1 0 0}$ |

## Source: Primary data.

## Problems faced in teaching and learning of mathematics

The respondent's view on this topic is the mathematics teaching and learning are challenging. These are the reasons; lack of textbooks, small size, negative attitude and narrow curriculum scope among others. Students were requested to indicate their feeling towards mathematics. The table above indicates that $60 \%$ of the respondents have negative attitude towards mathematics. This is a problem that needs urgent attention.
Respondents indicate that mathematics teaching and learning is challenging and outlined the following as justification for their stand.
Lack of enough teachers and learning materials (resources), wide syllabus. Other problems or challenges faced during teaching and learning were analyzed as follows according to the respondents.

8: Showing Challenges or problems faced during teaching and learning of mathematics

| Problems | Number | Percentage (\%) |
| :--- | :--- | :--- |
| Lack of interest | 40 | 18.18 |

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| Lack of enough books | 25 | 11.36 |
| :--- | :--- | :--- |
| Boredom | 15 | 6.82 |
| Not marking books and absenteeism | 60 | 27.27 |
| Not enough teachers and time | 70 | 31.82 |
| Inadequate teaching and learning <br> resources | 5 | 2.27 |
| Poor evaluation and low intelligence <br> among learners | 5 | 2.27 |

## Source: Primary data.

To solve the above problems, sample suggested the following ways/methods

- Supply of different types of textbooks
- Doing more practice, widening.
- Using teaching methods such as inductive method, deductive method, discovery method, discussion method, and others.
- supply of resources needed in the teaching methods
- Increasing time and more coaching of students
- Adding more teachers and discipline improvement in school/class.
- Giving prizes ,being loud and clear/good communication.


## Conclusion

The researcher made the following conclusions according to the objectives discussed above the impact of teaching methods on learner's performance in mathematics subject

According to author views in the literature, mathematics teachers' use of effective methods of instruction is important in helping students in developing their conceptual understanding and reasoning abilities. The performance and achievement of the children may be impacted by overworked teachers who are managing huge numbers of students. With a big class size, the teachers are unable to sustain effective instruction and consistent grading of the students' work. More class time is necessary for effective math instruction because it allows students to practice their mathematical and manipulative skills. The teaching methodology is dependent on the student and teacher in a specific class and on a specific subject.

Good teaching is largely a matter of personal aptitude and require meticulous planning/preparation and a selection of approaches and methods that results to optimum learning. Teaching/learning should involve activities aimed at helping students to arrive at the learning outcome. This depends on the method the teacher uses to teach. The teacher should approach his/her lesson in the way students are alert and active to avoid boredom and this.

Teachers should also start their lesson from known to unknown and this will make students grasp the subject content quickly.

## Recommendation

The researcher recommended the following. 1. The government should hire additional math instructors, and it should provide inservice training for unskilled instructors through institutions like Makerere University, Metropolitan International University, and Kyambogo University. This will assist teachers in developing their instructional strategies to raise student achievement.
3. Both the basic and secondary mathematics curricula should be reviewed by the Ministry of Education. In order to encourage pupils to think analytically and critically, objective questions in arithmetic should be eliminated.

In this way the emphasis will be shifted from the (answer) as the most important thing to the process of steps being undertaker, thereby improving interest and attitude towards mathematics subject.
3. The school Board of Governors should prioritize buying of more mathematics text books and of different authors.

This will help and motivate the learners to work hard on their own. The monopoly of one book may discourage the learners because the language used especially if difficult. They should also provide resources necessary for proper teaching for performance to improve Buwesswa Senior Secondary School.
4. Remedial teaching especially in mathematics should be encouraged in schools where there is enough mathematics teachers learn teaching methods should be adopted.
5. The school administration should consider making the school a boarding school so that students may have enough time to practice exercise especially in mathematics. This will solve the problems faced by the teachers.

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