



Implementation of Learner-Centred Approaches in Mathematics in Secondary Schools at Morogoro Municipality in Tanzania: Uses and Challenges

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ABSTRACT

The main purpose of this study was to understand teachers' effective use of the learner-centred approach in mathematics education to promote the mathematics achievement of secondary school students. Specific areas covered were to; reveal the use of the learner-centred approach and investigate the limitations of using the learner-centred approach among secondary school teachers in Morogoro Municipality. The research used a descriptive survey design. Data were collected through interviews and observational methods of data collection. Data from interviews and observations were analyzed in terms of content and topic. The results show that teachers used both teacher- and learner-centred approaches due to the unfavourable environment for implementing a learner-centred approach. It also showed that teachers should be trained to enable them to apply learner-centred approaches effectively. It is recommended to ensure that all key educational actors play their part, without which good teaching practices will always remain on paper. Here, too, an increase in the funds for the schools was recommended. The study concludes that applying the learner-centred approach in secondary schools is important.

Keywords: *implementation, learners-centred, secondary school, approach, and Morogoro*

1.1 Background of the Study

Many nations make mathematics a compulsory subject from primary to secondary school because it is a fundamental subject for human life (Makondo and Makondo, 2020). However, as indicated by various sources, it was poorly executed. For example, according to the OECD (2019), the International Student Assessment Program (PISA) in ASEAN countries shows that most students worldwide underperform in mathematics. In the Philippines, for example, students scored an average of 353 points in mathematics literacy, well below the OECD average (489 points) and classified as below level one. In addition, the National Assessment of Educational Progress (NAEP), which assesses student performance in 8th-grade math in both public and private schools across the country, indicates that the problem persists, with math scores in 2019 (282) lower than the score in 2017 (283). In Asia and America, the situation of mathematics in Africa was worse, as Mullis et al. (2012) reported that the Trends in Mathematics and Science (TIMSS) study revealed that between 68 and 90 per cent of African boys and girls in 8th grade failed to meet the low international benchmark in mathematics.

In addition, the International Mathematics Union (2014) points out that more than half of all students have not attained minimum proficiency levels in mathematics by the end of primary school. Some of the victim countries are Chad, Mali and Niger, which register fewer than 20 per cent of students who achieve such a minimum level in mathematics by the end of primary school. Furthermore, Bii (2019) notes that although mathematics was an important subject in the school curriculum, the performance of students in this subject at the KCSE level has declined over the years in the Kenyan education system. In addition, Reddy et al. (2016) also showed that South Africa remains a low-performing country in mathematics in the 9th-grade TIMSS report. This reflects the national average score of 372 in mathematics, which ranks South Africa 38th out of 39 countries.

In Tanzania, which was the focus of this study, the state of Mathematics was no exception, especially in secondary schools. For example, NECTA (2017) reported that about 80% of the students who sat for the national mathematics exams failed the exam. Likewise, NECTA (2018) claimed that only 20.2% of the students taking the form four (IV) national examinations passed Mathematics. A similar trend was also evident in the 2019 fourth-grade (IV) national exams, where Basic Mathematics performed poorly compared to all other subjects (NECTA, 2019). In addition, NECTA (2020) also found that the candidates who did form four (IV) exams had only a 20% pass rate in mathematics. With this evidence, it is justifiable that mathematics performance in Tanzania is worse every year. Morogoro in particular, as part of Tanzania, has long been affected by poor performance in mathematics despite efforts that have been taken to deal with the problem. To address these concerns, the results of the latest five-year form four national exam, in the selected secondary schools show that the problem exists in the region as a whole and Morogoro Municipality in particular. The distribution of schools and their respective mathematics performance was summarised as follows:

Many factors have been linked to poor performance in mathematics in secondary schools. These include learner interest, inadequate curriculum, school environment and use of a teacher-centred approach (Bramlett & Herron, 2009). Lack of competent teachers, inadequate teaching and learning resources such as books, and teaching aids, and understaffing in most schools (Ponera, Mhonyiwa, & Mrutu, 2011). Low teacher motivation, teacher attitudes towards students, poor teaching strategies, weak content knowledge of teachers (Mazana et al., 2019, & Michael, 2015), and teachers' emotions in the classroom (Frenzel et al., 2009; Klusmann et al., 2008). Other factors include; Examination situation, teachers' poor preparation for curriculum implementation (Uysal & Banoglum, 2018), lack of learning support, teachers' dissatisfaction with in-service teacher education in mathematics, and learners taught by teachers who have not participated in professional development (Asikhia, 2010).

Various efforts have been made to address the problem of underachievement in mathematics in the country. Some of them include; Training more mathematics teachers, and introducing information and communication technology (ICT) in teacher education and secondary schools in early 2002 (Kafyulilo, Fisser, Pieters, & Voogt, 2015). Also, the government made various inventories to conduct a full evaluation of all mathematics teaching materials, initiating several projects to improve teachers' pedagogical content knowledge and teaching approaches (Kitta, 2004). Furthermore, providing schools with adequate teaching and learning resources (Sumra & Katabaro, 2014), training teachers to build students' confidence about mathematics as the easiest subject, encourage questioning and creates room for curiosity, emphasises conceptual understanding over procedures, provides authentic problems that increase students' drive to engage in mathematics, shares positive attitudes towards mathematics (Kinyota, 2013 & Masele, 2018), making the best use of existing mathematics teachers (URT, 2010), applying classroom practices such as problem-solving and using visual aids (Pantziara & Philipou, 2007), and applying learner-centred methods (Mitu, 2014, Kafyulilo, Innocent & Ikupa, 2012 & URT-MoEVT, 2010).

Therefore, the learner-centred approach as the focus of this study insisted on constructing learners who can solve problems, be familiar with their real life, perform their tasks participative, and survive in their real-world context. This approach replaced the teacher-centred approach as the old approach to teaching, which academics and educators have found suffers from limitations in fostering learner understanding and adequate knowledge transmitted across all cohorts and grade levels, including university (MoEC, 2004). The reality was that a learning environment in which learners sat in their study area while the trainer acted as the sole actor in the lesson's progress made the learners inactive and lacked attention in the lesson which made it impossible to learn properly and effectively (Valls & Ponce, 2013).

With all these efforts, including using a learner-centred approach as a particular focus of the study, it was expected that the problem of underachievement in secondary schools in Tanzania in general and Morogoro Municipality in particular, might no longer exist. On the contrary, the problem persists. Therefore, it was necessary to collect the opinions directly from the teachers who regarded the effective and efficient use of a learner-centred approach as a remedy for underachievement in mathematics in these schools.

1.3 Research Objectives

The main purpose of the study was to understand the effective use of the learner-centred approach by teachers in teaching mathematics subjects to improve students' performance in secondary schools in Morogoro Municipality. In particular, this study intends to achieve the following objectives.

- i. To unveil the use of the learner-centred approach among the teachers in secondary schools in Morogoro Municipality.
- ii. To examine the constraints of using a learner-centred approach among the teachers in secondary schools in Morogoro Municipality.

2.0 Literature Review

2.1 The use of a Learner-centred Approach

In Thailand, a study done by Treesuwan and Tanitteerapan (2016) revealed that teachers applied a learner-centred approach. The approach helped teachers and learners to interact well by sharing and making collaborative discussions on different subjects, thus boosting students' confidence in articulating their feelings and sentiments.

O'Neill & McMahon (2005) did a study on the implementation of a learner-centred approach and realized that mathematics has always been taught in the traditional way, where the teacher is the main person teaching through lectures and activities, with the students being mostly in passive receiver mode. The study by Arakaza & Mugabo (2021) on teachers' practices in teaching mathematics in selected schools of Bujumbura Mairie Province in Burundi revealed that mathematics teachers use both learner-centred and teacher-centred teaching methods, but the classroom instructions are dominated by teacher-centred teaching, contrary to which national curriculum claim on emphasizes the use of learner-centred teaching practices. The targeted observation showed that many mathematics teachers focus on formal assessment rather than informal assessment.

In addition, Kapenda (2007) examined learner-centred approaches used by three mathematics teachers in the Khomas region of Namibia and found that learner-centred teaching is the officially adopted and encouraged way of implementing the curriculum in Namibia, although many incumbent teachers appear to have problems in implementing learner-centred education. Verbatim transcribed video lessons were used to highlight evidence of a learner-centred approach in three mathematics classrooms at the senior secondary level. The teachers' lessons show some traces of learner-centred approaches.

Muvumba and Mtitu (2022), conducted a study on the use of learner-centred approaches in Mathematics subject: A Case of Pugu Secondary School in Ilala District, Tanzania. The results indicate that the teacher very often used lecture methods, questions and answers, and think-pair-share methods. The

teacher often used group discussion, problem-solving, inquiry-based learning and discovery learning approaches. This implies that there is a mixture of methods of teaching teacher-centred methods and learner-centred methods of learning.

Lucinda, (2016) conducted a study on exploring Competence-Based Education (CBE) in Rural Secondary Schools in Tanzania: The results revealed that teachers preferred the use of question and answers and lecturing methods. Therefore, teachers should be trained on how to use a variety of learner-centred approaches to enhance students' achievements in mathematics.

Chimwanga (2014) conducted a study on the use of a learner-centred approach in the teaching-learning of French in O-level state secondary schools in Dar es Salaam. The study aimed at finding out the extent to which French language teachers put in place the LCTLAs which were adopted in 2005, The study found that teachers largely used teacher-centred approaches (TCAs) as they encountered transitional challenges such as insufficient instructional materials, overcrowded classes and poor proficiency of French which seemed to prevent them from effectively applying the LTCAs

Furthermore, Cosmas (2019) examined the learner-centred approach to teaching and learning mathematics in the Mvomero district of the Morogoro region. The results show that mathematics teachers were aware of the classroom learner-centred approach, although they did not use it in mathematics classrooms. In addition, the study also showed that most mathematics teachers prefer a teacher-centred approach to teaching and learning mathematics.

While this was the case for Mvomero, Mgyabuso & Mkulu (2022), they examined the implementation of the learner-centred approach and the repositioning of education in public secondary schools in Nyamagana district, Mwanza-Tanzania, but the results show that learner-centred approach has a significant role in the development lifelong learning skills of students. It develops creativity, critical thinking, problem-solving skills and innovation. Notwithstanding, the study found that while teachers and students viewed the use of a learner-centred approach positively, its implementation in public secondary schools is minimal due to environmental issues that result in poor academic performance among students.

In line with that, the study conducted by Phiri (2019) investigating the effects of using a variety of teaching methods in teaching and learning secondary school Mathematics, in Munich, GRIN Verlag asserts that there are numbers of methods that teachers use in Mathematics lessons, that may be grouped as teacher-centred and learner-centred, but still, for years the performance in Mathematics has not been any better. Pedagogy of mathematics includes the application of different teaching methods like a lecture, inductive, deductive, heuristic or discovery, analytic, synthetic, problem-solving, laboratory and project methods. The instructional methodology of every teacher should be adaptive according to each unit of the syllabus, available resources and the strength of the students.

Following this, Torp and Sage (1998) argue that mathematics and science can achieve success by implementing problem-based learning. Furthermore, according to Herman (2006), problem-based learning trains students to think flexibly, solve problems, and find common rules.

Regarding the studies reviewed above, it was found that the learner-centred approach to teaching and learning Mathematics is valued and applied in most countries. In addition, it was shown that many teaching methods are considered to be learner-centred. However, little was known about the application of the learner-centred approach to mathematics in Morogoro Municipality. Therefore, this study aimed to examine the application of learner centred approach that is specifically taken by mathematics teachers in selected secondary schools in Morogoro municipality.

2.2 Teachers' Difficulties in the Use of Learner-centred Approach

A study conducted by Olana & Amante (2017) examined the factors influencing the implementation of student-centred learning in the regional state of Oromia in Colombia and found that factors such as low attitude towards student-centred learning, insufficient teaching resources and lack of time for each lesson as well lack of teacher motivation The unfavourable working conditions are responsible for the low practice of the learner-centred approach. Furthermore, the insights from Du Plessis'(2020) research, which focused on student and teacher perceptions, experiences and challenges regarding learner-centred teaching, indicated that student teachers have a limited understanding of learner-centred teaching and are currently confronted with three serious challenges along the way, including disciplinary issues, overcrowded classrooms, and time constraints. Mavumba et al. (2019) conducted a study focused on the implementation of learner-centred teaching and learning approaches in advanced mathematics at Jangwani Secondary School in Ilala Municipality, Dar es Salaam. Common challenges uncovered included the lack of relevant teaching and learning resources, the overloaded curriculum for advanced mathematics, the inability of learners to engage with advanced mathematics subjects, the limited time available for teaching in the classroom, the lack of teacher training; and poor collaboration among students themselves. In addition, Kitta's (2010) study identified the challenges of an income-based assessment approach, namely the lack of teacher training. In this context, Kitta suggests that teachers need to be trained to be aware of the gaps in their skills and knowledge, weaknesses and strengths in developing learner-centred assessment methods applicable in mathematics and how they can be managed. to be aware. centred approach to mathematics teaching in secondary schools in Morogoro Municipality. With the growing demand for a learner-centred approach to mathematics education. Therefore, the present study aimed to examine in depth what challenges mathematics teachers face when implementing a learner-centred approach in their teaching process, especially in Morogoro Municipality.

3.0 METHODOLOGY

The basis of the study was the social-constructivist worldview. Qualitative research approaches with descriptive research design have been used extensively. Conducted in the municipality of Morogoro in Tanzania, the study was aimed at academics and mathematics teachers. A total of

ten samples were selected from five selected schools, involving five academics and five mathematics teachers. Data were collected using interview and observation methods. The data were analyzed using systematic and thematic analyses. All ethical procedures have been carefully followed.

3.1 Findings and Discussion

Implementation of Learner-Centred Approaches in Teaching Mathematics

The presentation of the results is mainly based on the evaluation of in-depth interviews with mathematics teachers and university teachers as well as the observation data. The analysis is based on two main questions which are underpinned by two specific objectives, namely: how the learner-centred approach is put into practice by mathematics teachers in secondary schools in Morogoro Municipality and what are the limitations of using the learner-centred approach for the teachers in mathematics teaching in secondary schools in Morogoro Municipality? Mathematics teachers and university teachers were interviewed. The researcher also conducted classroom observations of mathematics teachers. Using the learner-centred approach was one of the bases for the researcher to identify different interview responses. The interview responses were provided by both mathematics teachers and academic teachers. The results showed that there are three groups with different usage perspectives. Some preferred a learner-centred approach, others a teacher-centred approach, while some preferred using both at the same time.

When surveyed by the researcher, teachers who preferred the learner-centred approach responded that common methods of teaching mathematics include group discussions, question-and-answer techniques, individual work, demonstration, and brainstorming. The results show that the main method of the learner-centred approach was a group discussion conducted by dividing the students into five to ten groups of 10 members each. For example,

Zuberi on the use of group discussion said,

...I prefer to use group discussion First; I divide students into groups. Sometimes one class will have seven to ten groups depending on the number of students. Then I select the chairperson to monitor groups and I provide questions to discuss with a limitation of time for example 3 or 5 minutes then I appoint one student to answer.

Similarly, Yusuf commented on the group discussion,

Always in group discussion Mathematics teachers like to arrange students into groups and provide questions to them, then they proceed to tell students to present what they have discussed.

The above argument implied that math teachers took on the superintendent role in forming student groups, as they divided student numbers into five to ten depending on the context of the classroom, the books available, and the total number of students per teacher. This result is comparable to the results of Gachuhi (2013) who found that group discussion has been used extensively as a method of learner-centred approach in mathematics teaching by dividing students into manageable numbers and giving questions for discussion. Again, active collaboration with the method appears to improve student performance in secondary schools. A similar study by Olana and Amante (2017) found that the use of group discussions was 34.8%, with each group having five to seven students. The finding also corresponds to the studies by Buabeng et al. (2014) in Ghana, who found that the dominant teaching method was the discussion method, where mathematics teachers like to divide students into groups and ask them questions. Then they asked the students to present what they had discussed. In addition, a study by McGregor et al. (2000) showed that most teachers prefer group discussions by dividing students into groups and assigning each group different questions for discussion, which they then present to the class. Also, a study by Larson (1997) indicates that classroom discussions are conducted by grouping students in manageable numbers, which would help encourage students to think at a higher level in the learning process. However, the researcher observed that only three of the five teachers conducted group discussions in a logic that the teachers managed to split the students between five and seven. After that, they raised the responsible question for discussion, although no strict supervision by the teachers was observed during the discussion process. The other two teachers did not use group discussion at all. This implies that some mathematics teachers tried to use group discussions in their lessons, but there was still a problem using them effectively, while others refused to use them fully. This could be due to a lack of in-service training for mathematics teachers. Another important method reported to be used within the learner-centred approach was the question-and-answer technique. The results showed that math teachers start asking students questions and require them to answer the question.

For example, Patricia claimed that

I tend to provide questions to the students and students do those questions individually and provide answers.

Moreover, Joseph said on question-and-answer techniques that,

... they also like to use a question-and-answer technique whereby most of my Mathematics teachers prefer to use question-and-answer when they need to assess the level of understanding and knowledge of their students. They start by asking students questions and announce to students to respond to that questions..

The above view shows that some teachers liked to use question-and-answer techniques as these teachers felt obligated to ask students questions and ask students to respond to the given question to ensure that all students participate in the learning process. These teachers believed that once students actively responded to questions during the lesson, they would be easy to teach and manageable and would ultimately do well in school. This result is related to that of Gachuhi (2013) who found that using learner-centred methods such as question and answer by asking questions and choosing students to answer the question helps them to actively participate in the learning process. However, during classroom

observations, it was found that four teachers used the technique, but it was not enough to encourage students' critical thinking in the sense that the teacher solved the question while the learners listened to the teacher and only one teacher neglected to use it. This means that most mathematics teachers are familiar with the question-and-answer technique, which is one of the learner-centred methods. With such knowledge, they fail to use it in the required manner to advance students' thinking. This can be a factor in poor performance in mathematics among secondary school students. In addition, the finding related to the use of the learner-centred approach was individual activities. The math teacher gives students homework and asks them to return it the next day before class.

For example, Ally said that

...Then after I employ individual work, by arranging questions and assigning students to answer them separately.

Another respondent Salim commented on individual works,

Mathematics teachers apply for Individual works, as all of my Mathematics teachers prepare Mathematics questions and provide those questions to students to answer separately, always this individual work is submitted the next day or lesson.

The above results implied that providing students with individual work after the end of each lesson was collaborative activity by mathematics teachers, which they believe helped students find solutions to a specific question on their own to enhance their critical thinking and thus simplify the acquisition of knowledge for students and mathematics teachers in general. This result was similar to Kawishe (2016) who found that some teachers provide learners with take-home activities such as assignments because their numbers made it easier for them to find some relevant materials than a teacher who had to work hard to find to find materials. After evaluating the work, a teacher can find relevant information and record it for future use. However, during classroom observation, the researcher found that only one of the five teachers offered students individual activities to further their learning. This implies that there was a discrepancy between what was spoken and what was practised in the classrooms, which directly impacted students' math performance in secondary schools. Another well-known result was the use of the brainstorming method. The results showed that some math teachers tend to create problems for their students, forcing students to think outside the box to get an answer. This method encourages all students to share their ideas and find an answer. For example, Salim commented on the brainstorming on this

...they also like to use brainstorming methods, where some of my Mathematics teachers tend to provide problems to their students which forces students to think out of the box to get an answer and method encouraging all students to share their ideas and to come up with an answer.

This implies that teachers use a brainstorming method, which is very important to activate students' minds while they are in the classroom. Brainstorming helps teachers track students' understanding of a particular concept in math. For this reason, teachers have preferred to apply it in the classroom, believing that it has helped to encourage students' critical thinking in mathematical concepts. This finding was consistent with Salema (2005) who found that teachers preferred a learner-centred approach, which was brainstorming in which students were asked multiple questions to boost their minds and encourage them to come up with wonderful ideas. However, it was observed that only one teacher seemed to use the brainstorming technique well, as he asked the students questions and allowed more than three students to respond to a single question. This helped the teacher and the students themselves get an idea from more than one student in a single question. Two teachers also used them, but not in the way mentioned above, which supported the teaching and learning process. Two teachers did not fully utilize the technique. This indicated that mathematics teachers were not proficient in applying brainstorming techniques, which impaired students' critical thinking and eventually led to poor student performance in the subject. Another important result was the demonstration method used in the learner-centred approach. The study found that some math teachers prefer to associate an idea step-by-step with visual materials such as flipcharts, posters, and PowerPoint to help students understandably understand the concept. Joseph had this to say;

...Mathematics teachers used demonstration methods as sometimes teachers show what they said practically. For example, when they are teaching a set, they come up with a real object to show how the set is completed and students get an understanding of the issues of the set.

As per the quote above, it was implied that for effective learning there should be an interactive demonstration of the materials in the classroom setting. The interactive demonstration technique has been shown to help students have confidence and encourage independent learning. This result was similar to that of Buabeng et al.(2014) who noted that an interactive demonstration was conducted by the teachers who used to communicate an idea in a step-by-step process using visual means such as flip charts and PowerPoint. In addition, the observation found that only one teacher in five schools uses a projector. However, his methods did not effectively encourage students' critical thinking and collaboration between the students themselves and their teachers. This was because, from the beginning of the lesson to the end, the teacher dominated the class using a projector as a teaching tool and was not dominated by the students. The results imply that even the available low performance of students in secondary schools may be due to teachers' efforts in implementing the approach. However, during the observation, the methods were challenged by insufficient teaching and learning resources, overcrowded classrooms, and few teachers compared to the number of students. This is due to lower government investment in the education system. The next group are thematic teachers who prefer a teacher-centred approach and use question-and-answer. For example, Amina stated that

In the lecture method, I just start by introducing topics and then solving different examples and students they are supposed to take note of. Also, in question-and-answer techniques, many times I prefer to ask my students questions at the end of sub-topics to know the level of understanding concerning the topic.

Furthermore, Yusuf commented on the lecture method,

Mathematics teachers prefer to apply lecture methods as they tend to use direct teaching methods while they are teaching. Teachers start to teach from the first of the lesson up to the last of the lesson without involving the interaction of the students in the classroom.

From the point of view of the teachers mentioned above, this means that students are seen as meaningless thinkers who are supposed to be imparted knowledge. Therefore, it affects the students' direct mental ability in the learning process. Similar thoughts were raised in the study by Olana and Amante (2017). Furthermore, O'Neill and McMahon (2005) found that mathematics has always been taught in the traditional way, where the teacher is the main person teaching through lectures, with the students being mostly passive participants. This was also consistent with the observation that showed mathematics teachers used a teacher-centred approach, where the teacher taught while the learners listened. The question-and-answer method was also used during class time. This was reflected in the fact that almost all of the time spent in class one teacher as the main participant using chalk and blackboard, which hurts the implementation of the learner-centred approach. This means that most teachers use traditional techniques instead of the learner-centred approach, which may be due to an unfavourable environment for teaching and learning. It can be recommended that the government insists on a learner-centred approach by providing adequate equipment for the implementation of the learner-centred approach. Finally, there was a group of mathematics teachers who prefer to use both learner-centred and teacher-centred approaches at the same time. For example, as quoted by Juma

When I want to use a discussion method, I start by grouping students into five up to seven groups with 10 members in each group. Additionally, I also apply the Lecture method. When I apply the lecture method, I just start by introducing topics then teach and end with questioning students to know if the lesson was well captured by students.

As quoted by Fatuma that

Most of the teachers prefer to apply group discussion with students, usually with similar experience and educational level who often discuss Mathematics concepts within 10 up to 15 minutes to check their understanding of those contents. Finally, they use lecture methods by starting to teach topics without involving interaction with the students in the learning process. For example, they provide examples and make solutions to that examples to the learners to impart knowledge to those students.

The above views show that teachers are willing to adopt a learner-centred approach when teaching mathematics subjects, but face difficulties in applying it, forcing them to adopt a teacher-centred approach. This result is consistent with the study by Michael (2015) who found that teachers used participatory methods in teaching and other student-centred methods. The teachers divide the students into their groups to discuss the given math question. The problem is that the students are not active because they have trouble deriving mathematical concepts. This prompts teachers to apply teacher-centred methods in actual classroom practice. Also, the finding is in line with the study by Arakaza & Mugabo (2021) which found that teachers use both learner-centred and teacher-centred teaching methods in mathematics teaching, but classroom teaching is dominated by teacher-centred teaching where the teachers used lecture method in their teaching, and the students respect or listen to the teacher, and this occurs after the students have not been active in sharing an idea. Furthermore, this was consistent with the observation that showed that mathematics teachers started with direct instruction, where the teacher taught and the learners listened during the lessons. It was also observed that approximately 25 minutes was used to impart knowledge, and then the teacher used the group discussion for almost seven minutes, followed by six minutes of brainstorming. Finally, they used the question-and-answer technique based on a teacher-centred approach for about five minutes. This indicates that teachers felt that students were empty and stubborn and should be influenced by knowledge first before other methods such as group discussions could follow. Therefore, these beliefs influence students' attitudes towards learning mathematics, leading to massive failures in mathematics. This departs from the thinking of Vygotsky (1978), namely that communication between teacher and learner should involve learner collaboration and mutual support in solving mathematical problems. Social constructivism in mathematics implies that mathematics should be taught with an emphasis on problem-solving, where there will be an interaction between teachers and learners and the learners themselves.

Learners need to be encouraged to develop their problem-solving strategies. Therefore, researchers argue that the learner-centred approach helps learners easily recall what they have learned because learners are involved in knowledge generation (learning by doing makes learners perfect). Therefore, the responsible bodies and organizations should work to raise awareness on how to implement a learner-centred approach, create learning materials, improve teachers' working conditions and review the time allotted to each lesson for easy implementation of the learner-centred approach.

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3.1.1 Findings Three: Constraints of Using Learner-Centred Approach.

This is the final section that presents and discusses the results relevant to answering the third research question, namely: What are the limitations of using a learner-centred approach for the teachers in secondary school mathematics teaching in Morogoro Municipality? Also, the presentation and discussion will follow the same format of reporting as was used in the quest for one and two. Regarding the limitations of using an acquirer-centric approach, there were multiple responses from respondents. One of the limitations was overcrowded classrooms. Most teachers responded to the survey that there was a problem with the large number of students compared to the available classroom. It reached a time when a classroom was overloaded with up to 80 students at a time.

For stance, Ally said,

...Also overcrowded classrooms do not support the implementation of a learner-centred approach to be in smoothly way.

Another Zuberi claimed,

When I'm teaching Mathematics, I find difficulty in applying learner centred approach because you may find that one class is carrying more than 60 students thus, how can I implement learner centred approach in my class?

Based on the above teachers' view, this means that the failure to implement the learner-centred approach was due to the problem of a higher number of students compared to the number of classrooms available. This result was consistent with that of Mtitu (2014) who noted that one of the challenges in implementing the learner-centred approach was a large number of students in the class, which hampered implementation due to the difficult supervision of the groups. The groups are too large for the teacher, resulting in the teacher failing to engage their students. The methods are well implemented when there was an average number of students in an average class, ie 45 students. Also, the result was consistent with the study by Du Plessis (2020) who found that teachers experienced the problems of crowded classrooms when trying to implement a learner-centred approach that almost ended with the lecture method. The researcher's observation also revealed that out of the five teachers, only two teachers who had a serious challenge with a large number of students were observed. It was observed that three teachers had a reasonably satisfactory ratio of students in the classroom, ranging from 45 to 55. This indicates that the schools have a large number of students enrolled compared to the available classrooms in their schools. It can therefore be recommended that schools enrol multiple students depending on the number of classrooms available. The government should provide development grants to build new classrooms that compensate for and meet the needs of communities. Negative attitudes towards the subject of mathematics were also identified as another limitation of using the learner-centred approach. It has been said that learners show no interest in learning mathematics. They considered math a difficult subject, an attitude they often inherited from their parents and society. This led to poor implementation of a learner-centred approach in schools. Juma claimed that,

When I'm teaching Mathematics, I do face the problem of a negative attitude toward learner centred approach, my students believe that learning by themselves and understanding Mathematics concepts is difficult, they all want the teacher to do everything like explaining and solving different questions which mean they don't show a positive attitude toward learning which hinder the implementation of the learner-centred approach.

Furthermore, Joseph argues that,

I'm also a Mathematics teacher so I observe the challenge of a negative attitude students toward Mathematics subjects which affect the use of a learner-centred approach.

This finding implies that the tendency of students to shift their role, to learn actively and to do everything possible for teachers, such as explaining and solving different questions, because they believe that mathematics is a difficult subject, has an impact on the implementation of the learner-centred method had an approach and academic performance of students. This result was comparable to that of Andamon et al. (2018) who noted that learners' attitudes towards mathematics and conceptual understanding of mathematics were the factor contributing to the implementation of the learner-centred approach. This was also similar to the observation that found that in only two of the five schools, students were not interested in learning mathematics. In the remaining three schools, it was found that the students showed interest in the subject by showing little cooperation between them and the teacher, although this was not enough to support their learning. This means that students are exposed to an inferiority complex when learning mathematics. From this, it can be concluded that there is a need to convey to students, teachers and communities in general that mathematics is the simplest subject even used in our daily life. Therefore, students should not be afraid while learning mathematics. The lack of in-service training for mathematics teachers on how to implement a learner-centred approach in mathematics teaching was another major obstacle hampering the application of the learner-centred approach in mathematics teaching. For example, Salim had these that,

...Inadequate training is the main challenge facing Mathematics teachers in implementing learner-centred approaches in my school.

Also, Yusuf claimed that,

...lack of in-service training among mathematics teachers on how to implement learner centred approach is considered to be a major hindrance in implementing learner centred approach in my school.

From the above results, it is clear that a lack of in-service training has a profound impact on the implementation of the learner-centred approach among mathematics teachers and the teacher training to apply the approach. This affects the implementation of different methods, as teachers lack basic knowledge about their profession. In addition, the result agreed with the study by Mavumba et al. (2019) who found that lack of teacher training and poor collaboration between students are the main obstacles to implementing the learner-centred approach. Similarly, Kitta (2010) cemented that teachers' lack of training in implementing a learner-centred assessment approach results in students not understanding mathematical concepts. In addition, the observation revealed that not even one of the five teachers had received any training on the use of the learner-centred approach. This means that most teachers teach as they learn. Therefore, it is recommended that there is active in-service training that improves teachers' ability to apply the approach in teaching the subject. Another major limitation was the language barrier. The English language has been identified as one of the barriers to implementing an income-based approach to mathematics for both teachers and students. This negatively impacts reading comprehension, interpretation, and understanding of mathematical concepts. It also affects poor school performance. For example, Kambwili commented:

...Language barriers and Mathematics phobia. All hinder the implementation of a learner-centred approach.

Similarly, a study conducted by Imam (2016) showed that language barriers have a huge negative impact on the implementation of the learner-centred approach, resulting in poor performance in mathematics. This means that students do not do very well based on language understanding; It seems that from elementary school onwards, students lacked basic knowledge of the English language. Therefore, it is necessary to form a strong base of the English language from elementary school, or the government should change the language of communication learning from English to Swahili because of their mother tongue. In addition, it was reported that the lack of teaching and learning resources was another barrier to using a learner-centred approach. Patricia commented on this, for example

I found it difficult to apply a learner-centred approach in teaching Mathematics subject because of inadequate resources so it is better to apply teacher centred than learner centred approach.

Kambwili also commented that,

...inadequate electricity system, inadequate computer facilities, and books are the factors affecting the implementation of learner centred approach to mathematics teachers in teaching mathematics subjects.

About the above views, it was evident that the government does not allocate enough funds to buy the necessary requisites for teaching and learning. Therefore, the government needs to consider and take action to ensure that the learner-centred approach does not address the problems of cash shortages by increasing the resources available. This finding was also related to that of Mavumba et al. (2019) who found that inadequate teaching and learning resources such as books, materials, computers, software, projectors, and projects prevent learners from actively participating, especially resources that can be managed and manipulated by learners. Also, the result was similar to that of Olana and Amante (2017) who showed that insufficient teaching resources, too little time for each lesson and lack of teacher motivation due to unfavourable working conditions are responsible for the low practice of the learner-centred approach. Already during the observation, it turned out that, there were problems with missing projectors, books, display boards and electrical equipment. Given the above discussion, it seems that teachers do not implement the learner-centred approach due to the unfavourable environment. Therefore, it is recommended that the responsible bodies and organizations work to raise awareness of the learner-centred approach, provide learning materials, improve teachers' working conditions and re-examine the time allotted to each lesson. The last limitation that leads to the failure of the implementation of the learner-centred approach was the lack of time. All mathematics teachers claimed that the time allocated was insufficient to implement a learner-centred approach to teaching the concepts of mathematics. Zuberi claimed

When I'm teaching Mathematics, I find difficulty in applying learner centred approach because time coverage becomes the problem according to the time required to accomplish the topics

Similarly, Yusuf stated that,

...There are many contents to cover in a limited time which acted as a major hindrance in implementing learner centred approach in my school.

This implies that teachers are willing to apply the learner-centred approach, but this prevents them from allocating time to each lesson because they believe that allowing students to build their own knowledge through learner-centred classroom activities is time-consuming. The result was similar to Gachuhi (2013) who found that lack of time was the main challenge for teachers to implement an income-based approach. The author emphasizes that lack of time prevents teachers and students from implementing active learning in the classroom. The observation also found that only one in five teachers suffered from not having enough time to cover the necessary content in mathematics. The other four teachers suffered from the same problem while struggling to manage time, ensuring that the time allotted for each question was maintained in the group discussion. However, the finding contradicts the thinking of Vygotsky, who proposed that adults enhance children's cognitive development both by passing on the meanings their culture assigns to objects and events and by helping children with challenging tasks (Vygotsky learning theory, 2012). Vygotsky emphasizes the relationship between people and the sociocultural context in which they act and interact in shared experiences (Vygotsky, 2009). Therefore, learning development is the result of interaction between the child and their environment. To counteract this, the researcher recommended guiding principles that include seminar support and participation, reflection and the responsible intervention of mentor teachers along with improving the learning environment.

3.2 Conclusions

The focus of this study was to examine teachers' perceptions of the use of the learner-centred approach to fostering the mathematics achievement of secondary school students in Morogoro Municipality. The following conclusions were drawn from the research results: All teachers understand what the learner-centred approach is, so there is no problem with the meaning, but with the application. Both math teachers and college professors stated that some teachers use a learner-centred approach, some teachers use a teacher-centred approach, and some teachers use both at the same time. Those who indicate using the teacher-centred approach and both methods at the same time stated that there is no favourable environment for implementing the learner-centred approach. However, when researchers made an observation, it showed that all math teachers implemented a teacher-centred approach while teaching math and these could be the main factors influencing the math achievements of secondary school students in Morogoro Municipality.

4.0 Recommendations for Further Research

From the results of this study on the effective implementation of the learner-centred approach among secondary school mathematics teachers in Morogoro Municipality, the following recommendations emerge.

- Other researchers could work to see if the learner-centred approach helps secondary school leavers earn a living by generating different projects from the opportunities available.
- Other researchers could find out if teachers improvise the available materials when implementing a learner-centred approach in secondary education.
- Similar studies should be conducted across the Morogoro region and in Tanzania, in general, to draw definitive conclusions as to whether the results of this study are transferrable to other regions

REFERENCES

- Akaro, E. A. (2017). Influences of the School Leadership Styles on the Students' Academic Performance in Tanzania Community Secondary Schools: A Case of Dodoma Municipality. Unpublished Master of Education Dissertation. Dodoma: The University of Dodoma.
- Andamon, J. C., & Tan, D. A. (2018). Conceptual understanding, attitude and performance in mathematics of grade 7 students. *International Journal of Scientific & Technology Research*, 7(8), 96-105.
- Arakaza, A., & Mugabo, L. R. (2021). Teachers' Practices in Teaching Mathematics in Selected Schools of Bujumbura Mairie Province in Burundi. *Rwandan Journal of Education*, 5(2), 140-152.
- Asikhia, O. A. (2010). Students And Teachers' Perception of The Causes of Poor Academic Performance in Ogun State Secondary Schools [Nigeria]: Implications for Counseling for National Development. *European Journal of Social Sciences*, 13(2), 229-242.
- Bii, K. J. (2019). Effect Of Collaborative Concept Mapping Teaching Strategy On Students' Attitudes Towards Mathematics In Secondary Schools In Kenya. *International Journal of Education and Research*, 7(7), 57-74.
- Braun, V & Clarke, V. (2006). Using Thematic Analysis in Psychology: Qualitative research in Psychology, 3 (2). 77-101. ISSN (1478-0887). Retrieved May 19th, 2018 from <http://eprints.uwe.ac.uk/11735>
- Bramlett, D. C. & Herron, S. (2009). A Study Of African-American College Students' Attitude Towards Mathematics. *Journal Of Mathematical Sciences & Mathematics Education*, 4(2), 43-51.
- Buabeng, I., Aquinas, T. O. & Ampiah J. G. (2014). An investigation into physics teaching in Senior high school. *World Journal of Education*, 4(5), 134-141.
- Chediell, R., (2004). Pedagogy reforms in Tanzania: Learning from Experience. In N. Mtana, G. Hojlund, E. Mhando (Eds.). *Teaching and Learning in Primary Education in Tanzania* (pp. 235-255). Dar es Salaam: Ecoprint.
- Cosmas, D. (2019). *Learner-centred Approach in Mathematics Teaching and Learning in Tanzanian Secondary Schools: a case of secondary schools in Mvomero District* (Doctoral dissertation, Makerere University).
- Dupin-Bryant, P. A., (2004). Teaching Styles of Interactive Television Instructors. A descriptive study. *The American journal of distance education*, 18(1), 39- 50.
- Du Plessis, E. (2020). Student teachers' perceptions, experiences, and challenges regarding learner-centred teaching. *South African Journal of Education*, 40(1).
- Gachuhi, S. K. (2013). Assessment of learner centred teaching and learning Methods in Mathematics and Science subjects in secondary schools in Gatundu North district (Masters dissertation, Catholic University of Eastern Africa, Nairobi, Kenya). Retrieved from <http://ir.cuea.edu/jspui/bitstream/1/110/1/Samuel%20K%20Gachuhi.pdf>
- Herman, T. (2006). Pembelajaran Berbasis Masalah untuk Meningkatkan Kemampuan Berpikir Matematis Tingkat Tinggi Siswa Sekolah Menengah Pertama (SMP). Disertasi Pada Sekolah Pascasarjana Universitas Pendidikan Indonesia Bandung. Tidak dipublikasikan.
- Imam, O. A. (2016). Effects of reading skills on students' performance in science and mathematics in public and private secondary schools. *Journal of Education and Learning*, 10(2), 177-186.
- Kafyulilo, A. C., Rugambuka, B. I., & Moses, I. (2012). The Implementation of Competence Based Teaching Approaches in Tanzania. *Makerere Journal of Higher Education*, 4(2), 311-326.
- Kafyulilo, A., Fisser, P., Pieters, J., & Voogt, J. (2015). ICT use in science and Mathematics teacher education in Tanzania: Developing technological pedagogical content knowledge. *Australasian journal of educational technology*, 31(4).
- Kapenda, H. M. (2007). Learner-Centred Approaches in Math Classes in Khomas Region: Namibian cases. In *Proceedings of the 15th annual meeting of the Southern African Association for Research in Mathematics, Science and Technology Education* (pp. 199-205).
- Kawishe, T. K. (2016). *Implementation of learner centred methods within the constraints of shortage of instructional resources and facilities: A case of Itigi district council* (Doctoral dissertation, Mzumbe University).

- Kinyota, M. (2013). Students' perceptions of factors influencing choice of science streams in Tanzania secondary schools. (Master's thesis). University of Massachusetts - Amherst.
- Kitta S & Tilya F. (2010), The Status of Learner-centred Learning and Assessment in Tanzania in the Context of the Competence-based Curriculum. *Pap. Educ. Dev.* 29: 77-91.
- Kombo, D. K., & Tromp, D. L. (2006). Proposal And Thesis Writing: An Introduction. *Nairobi: Paulines Publications Africa*, 5 (1), 814-30.
- Kothari, C. R. (2005). *Research Methodology: Methods and Techniques* Wiswaprakashan: New Age International (P) Ltd, publishers. *Dharmesh Printers, Delhi*.
- Larson, B., (1997). *Influences on Social Studies Teachers' Use of Classroom Discussion*. Washington DC: Merrill Publishers.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic Inquiry*. Newbury Park: California: SAGE.
- Makondo, P.V. and Makondo, D. (2020). Causes of Poor Academic Performance in Mathematics at Ordinary Level: A Case of Mavuzani High School, Zimbabwe, *International Journal of Humanities and Social Science Invention (IJHSSI) ISSN (Online): 2319 – 7722, ISSN (Print): 2319 – 7714* www.ijhssi.org, 9 (6)1, 10-18
- Mavumba at al (2019). Implementation of Learner-Centred Teaching and Learning Approaches in Advanced Mathematics in Secondary Schools in Tanzania: Achievements and Challenges. *Journal of Issues and Practice in Education (JIPE)*, 11(2).
- Mazana, Y. M., Suero Montero, C., & Olifage, C. R. (2019). Investigating Students' Attitude Towards Learning Mathematics.
- Mgyabuso, G., & Mkulu, D. G. (2022). The Implementation of Learner Centred Approach and Reposition of Education in Public Secondary Schools in Nyamagana District, Mwanza-Tanzania. *International Journal of Humanities and Education Development (IJHED)*, 4(1), 85-99.
- Michael, I. (2015). Factors Leading to Poor Performance in Mathematics Subject in Kibaha Secondary Schools (Doctoral dissertation, The Open University of Tanzania).
- Ministry of Education and Culture [MoEC]. 2004. Education Sector Development Programme (SEDP), 2004-2009. Dar es Salaam, United Republic of Tanzania.
- Mtitu, E. A., (2014). Learner Centred Teaching in Tanzania: Geography teachers' perceptions and experiences. Retrieved on 3rd March, 2015 from <http://researcharchive.vuw.ac.nz>
- Mullis, I. V., Martin, M. O., Foy, P., & Arora, A. (2012). *TIMSS 2011 international results in Mathematics*. International Association for the Evaluation of Educational Achievement. Herengracht 487, Amsterdam, 1017 BT, The Netherlands.
- NECTA (2018). Taarifa Ya Matokeo Ya Upimaji Wa Darasa La Nne (Sfna), Kidato Cha Pili (Ftna), Mtihani Wa Kidato Cha Nne (Csee) Na Maarifa (Qt) Iliyofanyika Oktoba, Novemba Na November 2017.
- NECTA (2019). Taarifa Ya Matokeo Ya Upimaji Wa Darasa La Nne (Sfna), Kidato Cha Pili (Ftna) Na Mtihani Wa Kidato Cha Nne (Csee) Na Maarifa (Qt) Iliyofanyika Novemba 2018. Retrieved from <https://www.mbulutc.go.tz/storage/app/media/uploaded-files/Taarifa%20ya%20Matokeo%20ya%20D4%20K2%20na%20K4%202019.pdf>
- NECTA (2020). Taarifa Ya Matokeo Ya Upimaji Wa Darasa La Nne (Sfna), Kidato Cha Pili (Ftna) Na Mtihani Wa Kidato Cha Nne (Csee) Na Maarifa (Qt) Iliyofanyika Novemba 2019. Retrieved from <https://www.mbulutc.go.tz/storage/app/media/uploaded-files/Taarifa%20`ya%20Matokeo%20ya%20D4%20K2%20na%20K4%202019.pdf>
- Olana, E., & Amante, T. (2017). Factors affecting the implementation of Learner centred learning methods. *Journal of Humanities and Culture Studies* r & d, 2(11), 516-530. Retrieved from http://www.academia.edu/31595680/Factors_Affecting_Implementation_of_Student_Centered_Learning_methods
- OECD, PISA 2018 National Result of the Philippines, 2019
- Orodho, A. J. (2003). Essentials Of Educational and Social Science Research Methods. *Nairobi: masala publishers*, 54, 71-82.
- Orodho, A. J., & Kombo, D. K. (2002). *Research Methods*. Nairobi: Kenyatta University Institute of Open learning.
- Pantziara, M., & Philippou, G. (2007). Students' motivation and achievement and teachers' practices in the classroom. In *Proc. 31th PME Conference* (Vol. 4, pp. 57-64).
- Phiri, T. (2019). Investigating the Effects of Using a Variety of Teaching Methods in Teaching and Learning of Secondary School Mathematics, Munich, GRIN Verlag, <https://www.grin.com/document/468270>
- Ponera, G., Mhonyiwa, J., & Mrutu, A. (2011). Quality of Primary School Inputs in Tanzania Mainland. policy brief Number 2, SACMEQ. Retrieved from www.sacmeq.org
- Reddy, V., Visser, M., Winnaar, L., Arends, F., Juan, A. L., Prinsloo, C., & Isdale, K. (2016). TIMSS 2015: Highlights of Mathematics and Science Achievement of Grade 9 South African Learners.

-
- Salema, M. H. (2005). Teacher and trainer training in education for democratic citizenship: competencies, methods and processes.
- Sandelowski, M. (1995). Sample size in qualitative research. *Research in nursing & health*, 18(2), 179-183.
- Sumra, S., & Katabaro, J. (2014). *Declining quality of education: Suggestions for arresting and reversing the trend*. Economic and Social Research Foundation.
- Torp, L., & Sage, S. (1998). *Problems as possibilities: Problem-based learning for `K-12 education*. Ascd.
- Treesuwan, R., & Tanitteerapan, T. (2016). Students' perceptions on learner-centred teaching approach. *The New Educational Review*, 45(1), 151-159.
- URT-MOEVT, (2010). The United Republic of Tanzania, Ministry of Education and Vocational Training: Basic Mathematics Syllabus for Secondary Schools – from I to IV (2nd edition). Tanzania Institute of Education (TIE): Dar es Salaam
- Uysal, S., & Banoglum, K. (2018). Hogging The Middle Lane: How Student Performance Heterogeneity Leads Turkish Schools to Fail In PISA? *Cypriot Journal of Educational Science*, 13(2), 448-460. <https://doi.org/10.18844/cjes.v13i2.3196>
- Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press
- Wilson, S. (2013). *Determinants of Poor Academic Performance in Community Secondary Schools in Tanzania: A Case Study of Kinondoni Municipality*. Unpublished Master Dissertation. The Open University of Tanzania.