East African Journal of Education and Social Sciences
EAJESS November –December 2023, Vol. 4, No. 6, pp. 120-126.
ISSN: 2714-2132 (Online), 2714-2183 (Print). Published by G-Card
DOI: https://doi.org/10.46606/eajess2023v04i06.0339.

Experiences of Learners with Mathematics Learning Difficulties in Regular Classrooms in Malawian Secondary Schools

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Abstract: The purpose of this study was to establish the experiences of learners with mathematics learning difficulties in regular classrooms in Malawian secondary schools. The study embraced the qualitative approach and it was conducted in the Central West Educational Division in Lilongwe, at one secondary school with the learners' population of 1,100. Forty learners were sampled at the school to be involved in the study. Data was analyzed using the thematic method. Out of the results of the study, it was concluded that students experienced lack of support from their teachers as most teachers had negative attitude towards them. Teachers' use of poor Mathematics Instruction techniques caused the learners to have difficulties in the subject. Furthermore, lack of teaching and learning materials made the teaching and learning of Mathematics more theoretical than practical, which made the subject even more difficult for learners with Mathematics Learning Difficulties. The study recommends that the Ministry of Education needs to orient the general education teachers in mainstream schools on the effective teaching of learners with learning challenges such as those with Mathematics Learning Difficulties. Furthermore, there should be school based Continuous Professional Development programs for teachers of Mathematics to improve their classroom delivery of Mathematics lessons. The Ministry of Education should provide required teaching and learning materials in order to facilitate the teaching and learning of Mathematics.

Keywords: Inclusive education; Mathematical Learning Difficulties; Special needs education; mainstream.

How to Cite: Mitumba, H. B. and Chirwa, G. W. (2023). Experiences of Learners with Mathematics Learning Difficulties in Regular Classrooms in Malawian Secondary Schools**.** East African Journal of Education and Social Sciences 4(6), 120-126.Doi: https://doi.org/10.46606/eajess2023v04i6.0339.

Introduction

Today's classrooms are made up of learners with diverse cultures, languages, experiences, background knowledge, talents, interests and ability levels. In many countries across the world, students with disabilities are mainstreamed in general education classes. However, Wade and Zone (2000) argue that mainstreaming is more associated with cutting the costs of educating learners, creating a situation where students with disabilities may not receive the necessary support and specialized services to advance their learning.

There are about 70,000 learners with special education needs in Malawi and there are many categories of special educational needs; however, the most common needs observed in Malawian classrooms include physical impairments, visual impairments, hearing impairments, learning

difficulties and gifted abilities. Physical impairment refers to those children who have difficulty using certain parts of their bodies because they are handicapped in one way or another. Visual impairment, on the other hand, refers to those children who have problems seeing or children who cannot see at all. Hearing impairment refers to children who have problems in hearing or children who cannot hear at all. Learning difficulties refers to children who are slow in grasping concepts. These are children who require a bit of time before they can understand things. They are commonly referred to as slow learners. The gifted or talented children are those who learn very fast. They understand concepts quickly. These exceptionally bright children require special attention because they present special problems just like the other children with special needs (Kirk & Gallagher 2000).

Despite the efforts made by the government in the country to improve the provision of special education services, the current educational situation is still far from addressing the needs of every child. Adapting to educational programs is one of the major problems that a child with special needs such as learning difficulties faces when integrated in the regular classroom. Therefore, some form of educational support is necessary for these children to reach their potential (Kirk et al., 2000). Yet, little consideration is made for such children when designing the curriculum, planning for instruction, delivering the lesson and when conducting assessment.

Currently, the design of the Malawi education system only allows children with special needs to be integrated within normal classrooms and compete at the same level with the same learning conditions. Integration entails bringing the needs of children with special needs in line with the system of education, which, on the whole remains unchanged and is not adapted for them. On the other hand, inclusion means reforming the schools and planning school facilities and curriculum to meet the wants and needs of all children without exception (Irskaia-Smirnova & Loshakova, 2004). The consequences of having such inflexible standards are serious and have lifelong implications for the country such as school dropout and low literacy rates. Therefore, the country cannot realise the world goal to provide access to education to all individuals without addressing the needs of children with special needs. In order to successfully provide education to all and ensure that no child is left behind, educators should ensure that the needs of every child are considered at all levels from curriculum development, instructional planning and delivery and assessment.

The history of Special Needs Education in Malawi goes back to early 1950 by Scottish missionaries and South African Evangelical Missionaries at Chilanga in Kasungu District and Lulwe in Nsanje District. Special Needs Education services provided here were for children with visual impairments. Special Needs Education for learners with hearing impairments was introduced later in 1968. This started with the establishment of Maryview School for the Deaf in Chiradzulu District by the Fathers of Immaculate Conception of the Roman Catholic Church. In the same year, looking at the need for specialist teachers for these schools, the Roman Catholic Church started training specialist teachers at the Montfort College campus. The teacher training program was run and supported by the missionaries and other organizations. To supplement the earlier programs for the visually impaired and hearing impaired, the Malawi government, through the Ministry of Education and Vocational training, came in to assist as a partner in the training of specialist teachers and introduced another program known as Learning Difficulties in 1996. This program focuses on all learners with intellectual disabilities and it aimed to equip specialist teachers with skills to educate children with specific learning difficulties. The program explicitly targeted learners with exceptionalities (Mcheka, 2009).

Mathematics Learning Difficulties is a widespread problem among Malawian learners and is evidenced by the fact that some learners drop Mathematics or they deliberately opt to absent themselves from public examinations in the subject (Ministry of Education, 2020). Such reports of learners not liking mathematics reveal severe and persistent difficulties that learners face in learning this subject. However, there is very little research on Mathematics Learning Difficulties among learners in Malawi. It is against this background that this study was undertaken to establish the experiences of learners with Mathematics Learning Difficulties in regular classrooms from the learners' perspectives. The study was guided by a number of research questions.

Literature Review

This section presents the literature review that addresses the problem under investigation.

Understanding learning difficulties: what are they?

Learning difficulties is both an applied field of special education and is an area of research on individual differences in learning and performance. Similar to the concept of inclusive education, learning difficulties does not have a universal definition. However, the term learning difficulties is broadly defined as a general term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, spelling, reasoning and mathematical abilities. Learning difficulties in this study imply those disorders in which a person has limited abilities to perform specific skills or complete tasks by him/herself or if taught in conventional ways. Intrinsic to the individual and presumed to be caused by the central nervous system dysfunction, learning difficulties can occur across the lifespan of a person. Learning difficulties may range from mild to severe and may occur together with other handicapping conditions like sensory impairment, mental retardation and serious emotional disturbances. This, however, does not imply that learning difficulties are caused by these conditions (Torgesen, 1998).

Learning Difficulties in Mathematics

Learning difficulties are a common problem in Malawian secondary schools. Karagiannakis, et al. (2014) described Mathematical Learning Difficulties as a wide variety of deficits in maths skills, typically pertaining to the domains of arithmetic and arithmetic problem-solving. While mathematics difficulties manifest in different forms, Lunde (2004) recognized the following four forms: interference in systematic thinking and conception of space, poor learning methods (strategies), weak understanding of concepts and poor automatization.

Disturbances or interference in systematic thinking and spatial perception is the first form of mathematics difficulties among school-age children. Learners under this category find it challenging to think systematically and perceive the spatial concept correctly. These skills are crucial for one to understand the world around. Learners with these difficulties struggle to differentiate symbols; for example, they mistake + and – symbols. They also fail to distinguish between 12 and 21, 129 and 1029. This applies to children who have not fully developed number combinations. Such children also have problems when it comes to different stages in algorithms. Thus, although they understand the purpose of algorithms, they cannot generally solve successfully algorithms problems. This often shows itself as a concentration problem in the mathematics subject and is easily interpreted as an element of carelessness or negligence by learners (Lunde, 2004, p. 23).

The second form of mathematics difficulties is concerned with poor learning methods or strategies. Such learners, as already mentioned, have underdeveloped strategies for learning new material and they experience challenges in solving problems. This manifests in how they plan their work; thus, they often face challenges and appear disorganized in planning how to solve and complete tasks in mathematics. Although they may know algorithms, they may not fully understand how to apply them. They can also calculate but this takes a long time for them to do so.

Insufficient understanding of concepts is the third form of mathematics difficulties among children. Learners who fall in this category need support to understand the mathematical problem or how the problem is related to different mathematical operations such as subtraction and addition. Thus, they struggle in dealing with texts that involve several calculation operations. They have a significantly reduced abstraction level, meaning they can only manage concrete tasks. This often applies to a group of pupils whose ability level is low. The final form of mathematics difficulties concerns poor automatization. Learners in this category of difficulties in Mathematics cannot memorize such tables as multiplication and addition tables and must therefore calculate everything from the start every time and do not learn from the mistakes they make for improvements. This often applies to learners with low reading skills, poor memory, poor understanding of numbers/numeracy and those without task accuracy (Sjøvoll, 1998).

Learning Theories in Mathematics

Many theories and models explain how Mathematics is taught and learned more effectively. Among these many theories, cognitive-constructivism and socio-cultural theories explain how Mathematics is effectively taught and learned, especially for learners with learning difficulties in Mathematics. According to the Cognitive Constructivism theory, learning involves mental processes. This is quite the opposite of the behaviorism perspective, which believes in learning as a change in behavior resulting from responding to

stimuli. According to the cognitive learning theory, a child already has knowledge that needs to be developed and strengthened. A child has to develop new knowledge, which is also advanced. This one, however, needs sound mental processing, that is processing the information it has received from the sender (teacher) and accommodating it into its old experiences to form a new series of schemata (form).

According to Cognitive learning theory, children learn from simple to complex operations. The cognitive learning theory has several implications for learners with learning difficulties in mathematics. This relates to issues of knowledge construction, metacognition, adjusted teaching, and learning. How the teacher plans, organizes and delivers the content is crucial to ensuring that learners with learning difficulties benefit from the teaching. The teacher's role in mathematics is to stimulate learners to carry out independent mathematics experiences and therefore construct their own experiences. The teacher's task is to inspire learners and act as a supervisor, idea creator and leader. Another vital component in this theory is that of social interaction. In teaching mathematics, the teacher should act as a facilitator among learners where he/she manages to bring learners' subjective thoughts into the discussion, eliminate irrelevant ones and adjust the rest through discussion for every class member's benefit. For this process of interaction to take place, it requires active communication between the teacher and learners (Holm, 2002).

The socio-cultural theory which was founded by the Russian psychologist and educator Lev Vygotsky is another theory which explains how Mathematics is taught and learned more effectively. Vygotsky's socio-cultural theory of human learning views learning as a social process and the origination of human intelligence in society or culture. According to the theory, learning is seen as participation in social practices. The school is considered one of the arenas of learning and learning occurs through the learners' participation and interaction with teachers and other learners (Dysthe, 2001). The implications of Vygotsky's theory to learners with learning difficulties in mathematics is that such learners should be provided with socially rich environments in which they will explore knowledge domains with teachers, fellow learners and outside experts. Furthermore, technological tools such as computers and calculators should be used to support the learning environment. Collaborative learning should also be encouraged among learners. Teachers should give extra help to learners who struggle with their learning to help scaffold learners' evolving understanding and cognitive growth. Thus, given the assistance and collaborative activities, those with learning difficulties finally learn and internalize the strategies and language used by others in tackling the tasks. They finally manage to do the tasks without the help of others, thus reaching their zone of actual development.

Another essential component in Vygotsky´s theory is that children should learn from simple to complex materials. Thus, the mathematics teacher first works with learners within their developmental zone and then moves the child forward by working within the zone of proximal development. The learners are supposed to develop mastery in the area of concern before they are introduced to the next level of complicity. In order to help the learners develop new skills, the teacher does not just give children with difficulties in mathematics tasks that they can solve by themselves, but more complex tasks, tasks that they can solve with some guidance. In this way, instruction stimulates capacities in an embryonic state and pushes the development forward (Crain, 1992). It is evident that mathematics has more to do with abstract thinking and that most learners who face challenges in mathematics struggle with this area. Concerning Vygotsky´s way of thinking, children must learn abstract concepts and theories before thinking in abstract terms. The teacher must provide extensive support to the learners before they manage independently (Rasmussen 1997).

Research Methodology

Research Design

This study embraced a qualitative approach which was amenable to the study's objectives which sought to get insight into the experiences of Learners with Mathematics Learning Difficulties in regular classrooms in a Malawi Secondary school. Qualitative studies assume that multiple realities are socially constructed through individual and collective definitions of a situation (Creswell, 2014). The study used the collective case study approach.

Study Population

This study was conducted in the Central West Educational Division in Lilongwe. The study was done at one secondary school with the learners' population of 1,100. Forty learners were sampled at the school to be involved in the study.

Sources of Data

In this study, two methods of collecting data were used. These were face to face semi-structured interviews and classroom lesson observations. The two methods complemented each other to provide methodological triangulation which helped to cross check the credibility of the data in this study.

Statistical Treatment of Data

Data was analysed using the thematic method. According to Creswell (2009), this method of data analysis is described as a way of analysing data by organizing it into categories on the basis of themes, concepts or similar features.

Ethical Considerations

The study was conducted in accordance with the standard research ethics requirements of the Ministry of Education in Malawi. The researchers got permission from the Central West Education Division of the Ministry of Education to conduct this study in the schools involved in this study. The ethical considerations of the study involved securing the participants´ consent to participate in the study without being forced or tricked in any way. The participants were informed about the goals of the study, its advantages, and the implications of their involvement. Respondents had the right to withdraw from the study at any time. The real identity of the participants was kept confidential as pseudonyms were used in the study's final report.

Validity and Reliability

The study used methodological triangulation. Methodological triangulation helped to cross-check the credibility of the data in this study. This study thus involved different sets of interviews to provide methodological triangulation of the study. These interviews comprised learners with and without learning difficulties in mathematics and teachers. A pilot study was also conducted before the actual study. The pilot study helped with the identification of ambiguous questions and also less relevant questions. The researchers removed the unclear items.

Results and Discussions

This section presents the findings of the study and discusses the findings based on the literature. The section is guided by a specific research question:

Research Question: What are the experiences of learners with Mathematics Learning Difficulties in regular classrooms?

The study found that there are several challenges which learners with Mathematics Learning Difficulties face in regular classrooms as follows:

Lack of Support from Teachers

The study found that the majority of the learners with Mathematics learning difficulties described their teachers´ attitude towards them as being negative. Thus, most of them said that their teachers liked mostly those students who perform better in Mathematics compared to those who do not performing well. The students with Learning Difficulties in Mathematics complained that their teachers were not supportive in giving help to those who struggled with mathematics, and did not give them much help when they asked for it.

Poor Mathematics Instruction

The study found that although some students with learning difficulties in Mathematics perceived their teachers as having good methods and skills of teaching and competent in their job, the majority of the learners indicated that their teachers were neither qualified nor were having good knowledge of the subject matter. The study thus revealed some relationship between students´ performance and perception of their teachers. For example, the same students who were found in the study to have perceived their mathematics teachers as not well qualified and less knowledgeable of the subject are the ones who were also found to have been performing poorly in mathematics. These students also indicated that they never liked mathematics, and they put less effort in the subject and also they indicated that they sometimes missed mathematics lessons.

Unconducive Environment and Lack of Teaching and Learning Materials

The physical learning environment is a very crucial aspect when it comes to the process of teaching and learning. From the perceptions of the learners with learning difficulties in Mathematics, the study assessed three aspects of the classroom's physical learning environment. The first aspect related to the issue of classroom resources. The learners in the study described their mathematics classroom as being poorly equipped. Some learners thought that their classroom was poorly-equipped. For example, a Form One male student who felt that the classroom was poorly-equipped argued, "our mathematics classroom is poor in learning resources like text books. We do not have appropriate materials in geometry and we therefore end up

learning more theory than practice." Similarly, another Form One male student argued, "we lack certain important equipment for conducting experiments in certain topics in mathematics, we lack devices when learning about probability." When it came to the question of classroom space, the majority of the students with learning difficulties indicated that they studied in overcrowded classrooms. The overcrowded classrooms made the students not to have enough space for personal use and for practising solving Mathematics problems and this negatively affected the learning of Mathematics.

Classroom sitting arrangement was the other important aspect of the classroom´s physical environment assessed in this study. The study found that the majority of learners with learning difficulties perceived their classroom sitting arrangement as hindering interactions among them and negatively affecting their learning of Mathematics, which can be facilitated by the collaborative learning approach. For example, a Form one female student saw the classroom´s arrangement as problematic because the students were having freedom of choosing where to sit and most of the students chose to sit close to their acquaintances or friends and this was not constructive for promoting learning. The Form one student remarked, "many students sit close to their friends who are performing well and this does not enable us to interact with those who know the subject better for them to help us in the subject." The students' remarks show that those students with learning difficulties in the subject perceived their classroom arrangements as one of the factors contributing to their poor performance in Mathematics.

This finding on the influence of the physical environment on the learning of Mathematics concur with Nordenbo et al, (2008) who argued that classroom environment is one of the environmental factors in the school that affect learners´ social and academic learning. This type of environment can be looked at as a space or a place where learners and teachers interact with each other and use a variety of tools and information resources in pursuit of learning (Wilson, 1996). The nature of the classroom environment and social interactions that take place in it influence how students learn and achieve their goals. The classroom environment does not only affect the processes of teaching and learning but also influences learning outcomes and students' attitudes toward learning. Working in a preferred classroom environment that has required physical, social and psychosocial dimensions can improve learners' achievement (Fraser & Fisher, 1983). It is therefore not doubtful to argue that the environment has a role in students´ cognitive development as the environment is reported to influence the human´s behavior when one interacts with it. Therefore, the classes did not have good sitting arrangements that support learning. The sitting arrangements did not deliberately allow the learners with high abilities to sit together with those who had problems with their learning of mathematics. Therefore, this kind of sitting arrangement was a contributing factor to the problems in Mathematics faced by those learners who were experiencing learning difficulties in the subject.

Lack of Support from Fellow Learners

When learners with learning difficulties in Mathematics were asked about whether they were being supported by their classmates who were performing better in Mathematics, the majority of the learners with learning difficulties indicated that they were not being helped by their peers. Equally, the high performing students confirmed that they did not help their classmates who were facing challenges in Mathematics. The high performing learners indicated that they were not able to help their peers who had difficulties in Mathematics because they also considered themselves to have difficulties in certain areas in the subject, which meant that they also were in great need of help in the subject and therefore considered themselves not to have adequate time to help others.

This finding agrees with Nordenbo et al. (2008) who argued that good relationship among learners is one of the factors in the learning environment which are important for learners' academic and social learning.

Conclusions and Recommendations

Conclusions

The study concludes that students under investigation experienced lack of support from their teachers as most teachers had negative attitude towards them. Teachers' use of poor Mathematics Instruction techniques caused the learners to have difficulties in the subject. Lack of proper classroom sitting arrangement negatively affected the learners with Mathematics Learning Difficulties. Finally, lack of teaching and learning materials made the teaching and learning of Mathematics more

theoretical than practical, which made the subject even more difficult for learners with Mathematics Learning Difficulties.

Recommendations

The study recommends that the Ministry of Education needs to orient the general education teachers in mainstream schools on the effective teaching of learners with learning challenges such as those with Mathematics Learning Difficulties. Furthermore, there should be school based Continuous Professional Development programs for teachers of Mathematics in order to improve their classroom delivery of Mathematics lessons**.** Finally, the Ministry of Education should provide required teaching and learning materials in order to facilitate the teaching and learning of Mathematics.

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