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Psychosocial Factors Influencing Grade 7 Learners' Performance in Mathematics Classes at Primary Schools in the Northern Cape, South Africa

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Abstract

This study explores the psychosocial factors influencing Grade 7 learners' performance in mathematics classes at primary schools in the Frances Baard district in the Northern Cape Province of South Africa. The study adopted a qualitative interpretive approach infused with a multiple-case study design. The thematic analysis results show that some learners were not fully engaged in the mathematics classes despite having the necessary resources, including qualified teachers. The study revealed that family and community issues affect learners' academic performance in mathematics classes. It further found that some learners struggle to comprehend mathematical concepts taught in English, their second language. The study recommends that teachers should enhance their pedagogical approaches to fit learners' home languages, locations, and socioeconomic circumstances.

Keywords: Academic Performance, Grade 7 Learners, Mathematics Classes, Mathematics Teachers, Primary Schools.

1. Introduction

Researchers are increasingly interested in investigating learners' academic performance in mathematics classes. High performance in mathematics is depicted as a fundamental part of human knowledge and a central pillar in the modern technological revolution (Ernest, 2000). Similarly, understanding mathematics is a crucial component of human life, as it effectively builds mental development and encourages logical reasoning and critical thinking skills (López-López et al., 2022). This suggests that mathematics plays a significant role in education and the nation's socioeconomic development. This role explains how education helps individuals enhance their quality of life and improve their living standards (Oginni, 2021). If society does not get the education of the youth right, studying mathematics will remain an unrealistic dream for many.

Jojo (2019) highlighted that educational reform in South Africa has generally been politically driven. Consequently, the past 20 years have reduced education to serving economic ends, coupled with the conflation of mathematical prowess and problem-solving skills for the knowledge economy (Jojo, 2019). Attempts to redress the situation sought to ensure that all learners are exposed to mathematics at school before completing their matric. Poor academic performance in mathematics has attracted much attention among concerned stakeholders in South Africa. Despite

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many curricula reforms by the South African Department of Basic Education, from the NATED 550 to the Curriculum and Policy Statement (CAPS), most learners still struggle to pass mathematics. South Africa recently adopted the CAPS document as the education policy, which is constructivist, meaning that we are moving away from a theoretical underpinning of teaching mathematics towards a more relevant way of teaching it.

Learners still experience challenges with the subject, especially when transitioning from primary to high school. A study conducted in Zimbabwe examined the causes of poor academic performance in mathematics at a high school in Zimbabwe (Makondo, Makondo, 2020). Other studies have recently focused on factors contributing to poor learner performance in mathematics at selected schools in Mpumalanga Province in South Africa (Michael, 2015; Mabena et al., 2021). Extant literature reveals the negative attitudes embedded in the teaching methods and the negative attitudes of pupils, teachers, and parents towards mathematics and related subjects (Makondo, Makondo, 2020; Chand et al., 2021). Other scholars reported that mathematics teachers' poor experience and inadequate resources were the causes of poor performance in the subject (Suleiman, Hammed, 2019; Makondo, Makondo, 2020). Chand et al. (2021) found an ineffective mathematics curriculum to be the main reason for poor secondary school performance in the subject.

Similarly, Suleiman and Hammed (2019) explored the perceived causes of learners' failure in mathematics at junior secondary schools. The study found that transferring mathematics teachers, learners' poor socioeconomic circumstances or backgrounds, flawed teaching methodology, inappropriate periods allocated for mathematics, and overcrowded classrooms caused poor mathematics performance among learners. Owan (2012) indicated that private primary school pupils perform better in mathematics than public school colleagues. Michael (2015) found poor teaching environments, poorly managed mathematics departments, inadequate self-practice, and learners' poor backgrounds contributed to low grades obtained in mathematics. Literature has shown that learners showed disengagement in the class despite having what they needed in the mathematics classroom (Purdasseea, 2022). A study confirmed that schools must move away from teacher-centred approaches and adopt more learner-centred approaches to teaching (Mackatiani, Komo, 2018). The situation remains the same in various schools in many districts in South Africa. Literature shows that the parents or caregivers of learners must have a good social relationship with schools if learners' academic performance is to improve (Jimmyns, Meyer-Weitz, 2021). Furthermore, positive attitudes and emotions should be fostered among learners in the classroom when teaching and learning mathematics (López-López et al., 2022). Some scholars highlighted that learners' involvement, learner-learner interactions, teacher-learner interaction, satisfaction, task orientation, competition, order and organisation, teacher control, and innovation could be pertinent psychosocial factors that affect the teaching and learning of mathematics in Nigerian schools (Oyenuga, Lopez, 2012).

Poor performance in mathematics in junior high school is not an isolated issue but a far-reaching one worldwide. Some scholars reported that mathematics self-efficacy, mathematics anxiety, motivation, parental influences, adequate teacher support, teachers' competencies, and classroom instruction could influence poor mathematics performance (Kaskens et al., 2020). In South Africa, many studies have focused on factors contributing to poor learner performance in mathematics (Mabena et al., 2021). However, insufficient attention has been paid to psychosocial factors or non-structural problems such as resilience, anxiety, and language barriers, among others. Therefore, this study explores the psychosocial factors influencing Grade 7 learners' academic performance in mathematics classrooms in Frances Baard District in the Northern Cape, South Africa. This will bridge the gap in the existing literature, particularly in the context of South African high schools and the world at large, because the factors vary from one location or institution to another.

3. Methods

Research design

This study adopted a qualitative research approach to explore the phenomenon of losing momentum in learning in its natural surroundings (Athanasou et al., 2012). It employed an interpretive paradigm, which helps participants to share their ideas while maintaining integrity (Creswell, Creswell, 2018). A multiple case study design was suitable for this study since it allows the researchers to isolate and define an issue in its actual setting while yielding genuine and

authentic data and allowing for an in-depth interpretation of findings (Karlsson, 2016). The participants in this study were mathematics teachers.

Participants

This study's participants were six mathematics teachers in Frances Baard District in Kimberley, Northern Cape Province, South Africa (Sarfo et al., 2021). These teachers came from six schools, three of which were urban, well-resourced, and maintained, with a functioning School Governing Body (SGB). The other schools were moderately maintained and situated in regions of lower socioeconomic status, with SGBs that were not functional. The researchers invited all participants to the boardroom and explained the purpose of participating in this study based on their availability and willingness to participate. It was believed that these participants could provide enough knowledge and experience of the psychological, social, and academic factors that influence Grade 7 learners in mathematics classes. The participants had at least five years of experience teaching mathematics in Grade 7. Their race, gender, highest qualifications, home language, residential area, and teaching subjects were considered in this study. Participants had a mixture of home languages, including Afrikaans and vernacular languages.

Instrument

This study used semi-structured interviews with mathematics teachers for data collection. Although time-consuming, semi-structured interviews allowed researchers to elicit valuable data from the participants, with a rich tapestry of information. This instrument comprised open-ended questions about the psychological and social factors influencing Grade 7 learners' performance in mathematics. Some of these factors include learner resilience, learner enthusiasm, disengaged learners, learner confidence, and learners' behaviours influence their learning. The social factors include peer relationships, community issues, and family-related issues. The interview sessions lasted 45 minutes for each participant and were recorded with the participants' permission.

Data analysis

Data were analysed using the thematic analysis technique, which helps to organise and give meaning to data (Mills et al., 2012). There is no risk of contaminating the data during this analysis, making it a safe data analysis method (Bryman, 2012). This technique was chosen for its flexibility, allowing researchers to determine the recurring themes that emerged (Hawkins, 2018). The recordings of the interviews were transcribed, and the researchers read the data thoughtfully and insightfully, gaining familiarity with it. The researchers refined the data by recognising the essential themes related to psychological, social, and academic factors that emerged; the recurring themes became the main themes. Regarding the trustworthiness and credibility of the data, all data collected for this study was scrutinised and transcribed by an electronic device. The confirmed data was then protected, providing dependability to the study (Maree, 2020).

Ethical considerations

Permission to conduct the study was sought from the Ethics Committee at the University of the Free State. The Department of Basic Education in the Northern Cape Province granted approval to conduct the research at the selected schools (UFS-HSD2021/0315/21). Copies of the consent form, which explained the nature and intended outcomes of the study, were given to all participants. Appointments were made with each of the principals, seeking permission to have their mathematics teachers take part in the study, and all of them provided this permission. The researchers contacted each participant and indicated the purpose of the study before the data collection began. The interviews lasted between 45 minutes and an hour each. The transcriptions of the interviews were stored electronically on a memory stick.

4. Results

Biographic results

Table 1. Biographic results

Participants	Gender	Age	Subjects taught	Schools
Participant 1	Female	31	Mathematics; PE and Technology	City Schools, well-funded.
Participant 2	Female	53	Math and Social Sciences	
Participant 3	Female	55	Mathematics and Economic Management Sciences	

Participants	Gender	Age	Subjects taught	Schools
Participant 4	Male	56	Mathematics	Lower economic income schools and less funded schools.
Participant 5	Female	33	Mathematics	
Participant 6	Male	42	Mathematics, PE, and Technology	

Thematic results

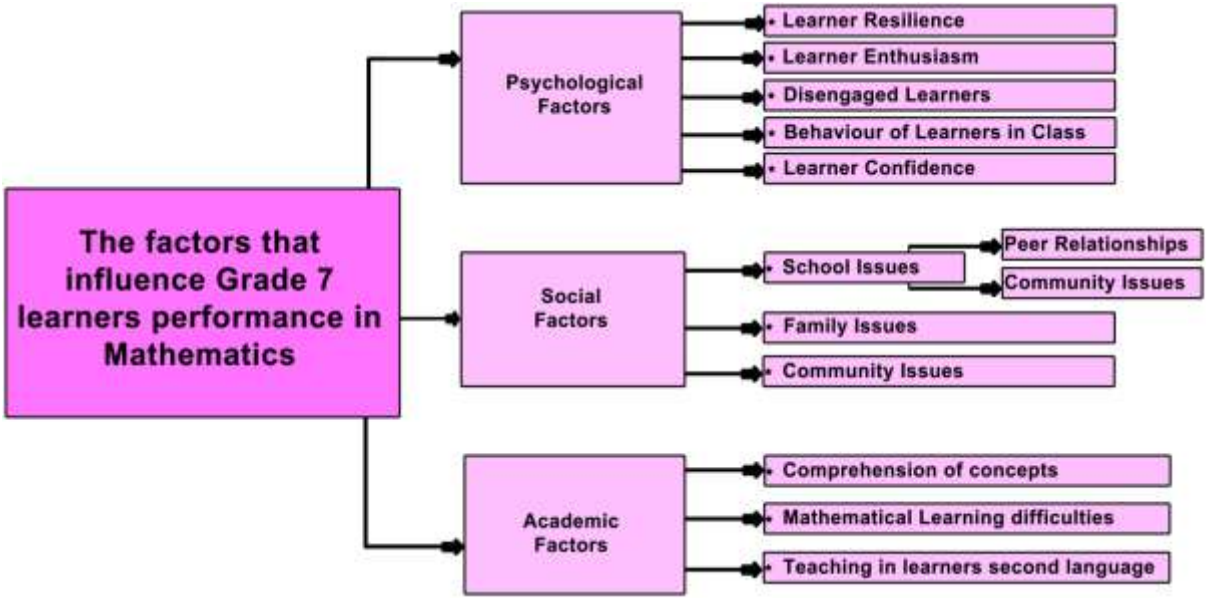

Fig. 1. Psychosocial factors influencing Grade 7 learners' academic performance in mathematics classrooms (Ajimudin, 2021)

As illustrated in the framework diagram in Figure 1, it explains factors influencing Grade 7 learners' performance in the mathematics classroom. Three types of factors are involved: psychological, social, and academic. Psychological factors included strong learners despite their difficulties and enthusiasm for mathematics. Some were, however, disengaged despite having what they needed to succeed. Social factors influencing learners' performance included issues like good relationships with teachers and friends, and family and community issues in the immediate environment where learners live, which could affect their performance. Academic factors are related to the teaching and learning issues that Grade 7 learners experience. Some have continuous difficulties with mathematics, meaning they have a learning problem; some must re-learn the basics of mathematics, so they do not perform optimally. Comprehension of concepts refers to learners sometimes missing and not fully understanding the concepts of mathematics when they reach Grade 7.

Psychological factors

This study found that resilience, enthusiasm, disengagement, teacher attributes, anxiety, learners' demeanour, and confidence are among the psychological factors influencing the performance of Grade 7 learners at selected primary schools in the Frances Baard District.

Resilience

This study found resilience to be a psychological factor influencing the academic performance of Grade 7 learners in mathematics classrooms at the selected primary schools. Some teachers highlighted that learners must cope with negative situations, especially during COVID-19 when schools were on lockdown. They stated that learners exhibit resilience when they persist in their school work. When satisfied in their classroom, they often work hard and accept responsibility for their learning:

"Resilience occurs when learners persist in a task till they have mastered it" (Teacher 2).

Learners show resilience by bouncing back and remaining on their feet when faced with a complicated situation. Despite the difficulty that learners experience with mathematics, they can still do their work and be productive individuals. Perhaps adults underestimate learners' resilience,

perceiving them as weak. However, because they are young, they may be able to develop greater resilience in the face of adverse situations. The participants stated as follows:

"Learners' emotional situations make them either strong or weak" (Teacher 1).

"Despite experiencing difficulties, learners still do well" (Teacher 2).

"Learners are even more resilient than we give them credit for. We need to come down to their level. The way I teach makes them resilient" (Teacher 5).

"Learners have low resilience; however, only odd children persevere through difficulties. Some learners do not even try, and in a class of 40 learners, I reach out to four or five children, 10 % of the learners. That is scary" (Teacher 6).

Teachers from the selected South African schools expressed various opinions regarding the resilience of their learners. Some learners were reportedly resilient because of their challenging circumstances, while others were said to be struggling; hence, their resilience was still questionable despite the support they received from teachers.

Enthusiasm

Enthusiasm could be a psychological factor influencing the academic performance of Grade 7 learners in mathematics classes at the selected primary schools. The teachers interviewed stated that in the mathematics class, the learners' feelings determine the level of their satisfaction and success. Similarly, learners' enjoyment and attention in class signify their happiness. Their willingness to attend school regularly and participate in their lessons indicates their happiness. Learners' level of engagement within the mathematics class signifies learner satisfaction:

"If a child is working in class, they are comfortable in that space, which makes them prosper" (Teacher 2).

"Nothing breeds success like success itself. Mathematical thinkers are good at it, and this breeds enthusiasm" (Teacher 6).

"When learners are interested in learning and if they love the subject, they exhibit enthusiasm and progress" (Teacher 4).

Enthusiasm could be a major psychological factor influencing learners' mathematics success. The successes they experience motivate them to put in the effort needed to attain their ultimate success.

Disengagement

Disengagement could be considered one of the psychological factors that influenced Grade 7 learners' academic performance in mathematics classrooms at the selected primary schools. The teachers interviewed mentioned that learners did not openly declare their unhappiness in a class; they reportedly displayed it as disengagement. They exhibit a disruptive and inattentive disposition towards the teachers and adopt a lackadaisical approach to their work. One teacher mentioned that some learners display anger by becoming violent toward others and the environment. Another expressed her concern over learner disengagement, which manifests in their results. Ultimately, the learners' emotional instability manifests in their dissatisfaction with classroom activities:

"*Learners hardly show dissatisfaction; they display disinterest and are not focused. This manifests in their low marks. Sometimes, learners show dissatisfaction by displaying anger* (Teacher 6).

"They do not show dissatisfaction with our thoughts but act out their dissatisfaction" (Teacher 5).

"Learners do not openly show their dissatisfaction in the classroom; however, they display defiance, sometimes not working and not paying attention" (Teacher 1).

Learners display disengagement from the classroom by showing weakened results. This impedes learners' success.

Anxiety

The responses in participants' transcripts demonstrate that Grade 7 learners' anxiety could be a psychological factor influencing their academic performance in mathematics classrooms at the selected primary schools. Teachers stated that Grade 7 learners experience fear in the classroom, and this anxiety precipitates learners' poor performance. The anxiety the learners' experience is usually expressed as fear, as some were reportedly afraid of talking to teachers. One teacher

observed that learners had felt some sort of anxiety during the COVID-19 pandemic, thus causing a decline in their performance in mathematics. In extreme cases anxiety can cause sickness in learners. Friends often exacerbate learners' anxiety, thus pressuring them into certain behaviours. A teacher expressed regret at not having enough opportunity to show concern for the learners' situations. Another said that some learners' anxiety emanated from the nature of the subject:

"The anxiety and difficulty learners experience emanate from the issues they face daily. Some of them experience anxiety because of COVID-19" (Teacher 5)

"Learners experience anxiety. However, this is not obvious as they do not openly show it. They can only show it when they have an opportunity. I have not given them enough opportunity to express their issues" (Teacher 6).

"Some of the learners do experience anxiety. One girl constantly faints in class, and this adversely affects her performance, including that of other learners, sometimes" (Teacher 4).

Learner anxiety often manifests in their behaviours and attitudes toward classroom activities. Some learners present with physical signs of anxiety, such as fainting and being sick when the subject content of geometrical and algebraical mathematics quantity (numbers), structure, space, and change are covered. A group of learners also presented with anxiety emanating from aspects of the subject, which evolved through abstraction and logical reasoning from counting, calculation, measurement, and the systematic study of the shapes and motions of physical objects.

Misbehaviour

The participants' responses indicate that the misbehaviour displayed by Grade 7 learners could be considered a psychological factor influencing their academic performance in mathematics classes at school. Teachers said that learners' demeanour determines their poor performance in mathematics classes. Learners who behave well and engage with the teacher perform well in their schoolwork. Teachers expressed that learners' performance signifies their behaviours in class and that a culture of learning in the school positively impacts learners' performance.

"Learners are just not interested in what we teach them" (Teacher 5).

"*Some learners sit in the hall, but even those in the classrooms are not well-behaved. More than half are battling concepts*". (Teacher 4)

"They are given rules right at the beginning, and they know what is expected of them. Learners will only misbehave when the teachers give them the permission to do so" (Teacher 4).

The learners' classroom behaviours largely depend on the teachers' ability to instill discipline and respect by applying rules and regulations. Teachers who can control learners do not experience these disciplinary issues in their classes and pre-empt misbehaviours by keeping students engaged when learners are not following classroom or school rules. Learners sometimes present with disciplinary issues because they do not listen to the lessons and prevent other learners from learning. Teachers reiterated the need to control the behaviours of the learners:

"During COVID-19, the classes were made smaller; hence, we should keep a finger on the pulse. The learners will struggle when they all return" (Teacher 2).

"I do not experience disciplinary problems in my classes. My learners are generally well-behaved and rarely give me problems" (Teacher 1).

Learners who experienced COVID-19 conditions in the classroom behaved better as the classes were smaller. However, the general behaviours of learners constitute a significant factor determining learners' success in the mathematics classroom.

Confidence

Responses from participants' transcripts indicate that the confidence shown by Grade 7 learners could be considered a psychological factor influencing their academic performance in mathematics at the selected primary schools. Learners display confidence in class when they are sure of themselves and not afraid of making mistakes. They often demonstrate confidence when they receive adequate support from their teachers and parents and have grasped the concepts. When learners' self-esteem is boosted, they feel it is necessary to raise their performance in the mathematics classroom. Learners' success leads to their confidence in the classroom; their confidence will wane if they struggle academically. Learners who understand their work in class will have confidence, enhancing their mathematics performance:

"Their confidence grows when they succeed academically. They even feel superior about their work" (Teacher 6).

"Learners' confidence in mathematics varies according to their ability. When they know the concepts, they exhibit more confidence" (Teacher 5).

Learners' confidence stems from their knowledge and ability to navigate the subject. The most confident learners are those who succeed in mathematics.

Social factors

This study demonstrated that the social factors that influence the performance of Grade 7 mathematics learners in the Frances Baard District seem to replicate themselves in the school, family, and community.

Social factors in the school

Learner-learner relationships

The responses from participants' transcripts show that learner-learner relationships could be considered a social factor influencing the academic performance of Grade 7 learners in the mathematics classroom. Thus, learners' relationships impact their performance:

"In our school, interactions are subdued, as the school is very small and there are no major social issues" (Teacher 4).

"We have girls that form groups, and some want to be worse than others. Maybe this is hormonal, and such learners are problematic. They agitate each other to be difficult" (Teacher 5).

"Learners in a group model and emulate each other; this benefits problematic learners and the rest of the class" (Teacher 2).

Despite these adverse situations, the learners can still perform well. The groups in mathematics classes motivate each other:

"They can perform well despite the friendly situation prevailing in the class" (Teacher 1).

"The culture in our school ensures that most learners will learn because their groups are competitive and want to compete for the best position" (Teacher 6).

Learner-learner social interactions determine learners' success in the mathematics classroom. This interaction determines how learners interact with the learning material.

Learner-teacher relationship

The responses from participants' transcripts show that learner-teacher relationships could be a social factor influencing Grade 7 learners' academic performance in the mathematics classroom at primary school. The teachers' attributes directly affect how learners cope and perform. If the teacher is too strict, the learners fear expressing themselves and will not be responsive in class. Learners' performance will be raised when teachers know their content and are enthusiastic about teaching. The teacher is the main driving force behind classroom performance, as they are responsible for the atmosphere that prevails in the classroom, which impacts learning. Learners need encouragement because they are young and vulnerable. The teachers believed that if educators presented the lessons enthusiastically, learners would keep up their interest, significantly enhancing the classroom climate. Teachers who use positive reinforcement encourage learners to work hard:

"I enjoy teaching my learners new concepts, as shown in my presentation" (Teacher 6).

"My learners love my lessons, and the videos I use keep them entertained. Effective teaching methods help to maintain discipline. The learners' behaviour depends on the teachers' teaching methodology" (Teacher 2).

"Teachers ought to consider the learner's situation. They need to care for the children's needs, looking at the situation from their perspective" (Teacher 3).

"The teachers' attitude communicates a lot to the learners; when they are confident, they will capitalise on that and will also be confident" (Teacher 5).

Teachers' relationship with their learners hugely impacts the learners' attitudes and how they learn. This also adds to the enjoyment they experience in class.

Family issues

Responses from participants' transcripts indicate that family issues among the Grade 7 learners could be a social factor influencing their academic performance in the mathematics

classroom at selected primary schools in South Africa. The teachers mentioned that they knew of the family-related social issues their learners experienced, such as living with grandmothers and having parents working away from home. Learners may live with older siblings, which means they do not always have the support of strong family relationships. Some teachers felt that their learners were getting the psychosocial support they needed, and thus, family structural issues should not be a problem. Many teachers attested that their learners remained strong despite these difficulties. The parents' economic situation profoundly affects the learners' social background.

One teacher mentioned that the on-site social worker cares for the learners grappling with adverse social situations the school cannot handle. When learners from poorer homes come to school, they are more likely to be affected by the situation at home than their peers from wealthier families. Teachers lamented situations where parents only take responsibility for their children's physical needs, leaving the rest to the educator. Five teachers declared they witnessed little or no parental involvement in their child's schooling. If parents were perhaps more involved, this would instill accountability among the learners. As three participants noted:

"The family situation either positively or negatively affects learners" (Teacher 5).

"Many learners face social issues at home, often negatively impacting their schooling. Such issues are not always evident but do come up often" (Teacher 4).

"Parents feel that once the learner is in school, they cease to be their responsibility. They avoid taking care of their children" (Teacher 1).

Learners come to school with certain feelings, depending on their origins. This stems from their relationship with their families. Learners residing in the Frances Baard district often live with other family members, which determines how learners feel at school.

Community issues

Responses from participants' transcripts suggest that community issues are a social factor that influences Grade 7 learners' academic performance in mathematics classes at primary school. The school is a microcosm of the larger community, and those social ills that are prevalent in the community permeate into the school system. The participants stated that some difficulties that learners face emanate from their communities, such as bullying of weaker learners. The areas that some learners come from have a stigma attached to them, and learners are often affected by that reality. Most schools provide learners with food; however, this is not the only social issue that learners face. The poverty that the community experiences influences learners' performance in class. One educator mentioned that the different factions learners subscribe to result in learners discriminating against each other despite their minor differences. There were various factions in one of the schools, and these groups came into the school and disturbed its harmonious functioning:

"My learners are affected by the community they come from; some of them come from very poor communities, a situation that negatively affects them. They come from rough areas" (Teacher 1).

"Some learners are indoctrinated into joining gangs early, and this accompanies them to school. This has become a serious problem these days" (Teacher 3).

Violence has always prevailed in South Africa, as communities are riddled with gangsterism and social ills. This issue hugely impacts learners' performance. Learners from these areas are mentally and emotionally affected by their surroundings.

Academic factors

The academic factors that influence Grade 7 learners' performance in mathematics classes include the inability to comprehend concepts, mathematical learning difficulties, the language barrier, and the lack of appropriate mathematical resources.

Inability to comprehend mathematical concepts

The responses from participants' transcripts indicate that Grade 7 learners' lack of comprehension of mathematical concepts is an academic factor that negatively influences their academic performance in mathematics classes at primary school. Teachers opined that the inability to comprehend concepts is believed to be the most familiar challenge, as this is the inner nature of mathematics; thus, the retention of facts can always be learned, though learners will get to use a calculator later. Mathematics requires learners to analyse and solve complex problems (Krawitz et al., 2022). Understanding mathematical concepts becomes easy if learners' conceptualisation of the

content is strong. Teachers think that if learners' foundation is not strong, they struggle to grasp mathematical concepts. Mathematical concepts are what learners need to learn in the lower primary grades; if their number of concepts were adequately consolidated, they would not have this problem. If they know the relationship between numbers, their understanding will be enhanced:

"The retention of facts is problematic to learners, as they hardly apply themselves enough. They can understand everything, though they do not clearly understand the concepts" (Teacher 1).

"The retention of facts and concepts is balanced in difficulty, some retention and others concepts. They know what numbers are. It does not have to be difficult" (Teacher 2).

"Strong learners understand the concepts and retain the facts. On the contrary, weak learners cannot do any of those things" (Teacher 3).

Two major factors affect mathematics learners: the retention of facts and understanding of concepts. Learners with these two attributes are less likely to struggle during mathematics classes.

Difficulties with learning mathematics

The responses from participants' transcripts demonstrate that difficulties with learning mathematical concepts is an academic factor influencing the performance of Grade 7 learners at primary school. Educators expressed issues with mathematical difficulties, some of which are prevalent because the learners do not know the basics of mathematics. Some teachers advocated adopting and modifying teaching strategies to overcome this problem. These teachers felt that there were no difficulties in learning mathematics, arguing that everyone was capable and they just had to apply themselves. The curriculum has perhaps rapidly moved on to abstract teaching, and learners often cannot visualise what is being explained. The Grade 7 curriculum vastly differs from the previous grades in that fractions, for example, jump from looking at a fraction wall in Grade 6 to no use of the wall in Grade 7. The teachers mentioned that concrete manipulatives should be used, but consecutive numbers were mentioned as problematic.

Learners struggle to understand specific topics, such as fractions and geometry, which must be concretised to enhance their understanding and mastery of mathematics. In geometry, the learner must be pre-exposed to certain educational games. Some teachers mentioned that geometry is challenging for learners with developmental difficulties. If learners are not at the expected developmental stage, where they can understand how these shapes can be manipulated, they will face difficulty in understanding three-dimensional (3D) shapes. Two teachers said that the teaching strategies that should be used have to be adapted to the learners' level. Learners do not always understand what they are reading, which becomes a problem:

"When learners are at the right developmental stage, they do not struggle with 3D shapes. Those who struggle with it did not have enough exposure to it" (Teacher 1).

"Learners have not been taught well in the earlier years; hence, they struggle" (Teacher 5).

"Consecutive numbers are a problem, but when learners eventually get the concept, it will be too late, and the concepts will be difficult at that stage" (Teacher 4).

One crucial factor that could contribute to learners' success in the mathematics classroom is having a solid foundation of the subject in terms of number concepts and number sense. This is because mathematics is a scaffolded subject, meaning that what is learned early on is essential for learners' later success.

Teaching mathematics in the learners' second language

The participants reported that teaching mathematics in the Grade 7 learners' second language is an academic factor influencing their academic performance in mathematics at primary school. Teachers reported that teaching and learning mathematics is a complex issue, and when learners are taught in their second language, this becomes a barrier. The language of teaching and learning is essential as it enhances understanding of the concepts taught. It is important to note that the language of school instruction differs from the learners' home languages. The vernacular language of learners in the Frances Baard District differs from the medium of instruction, which may negatively impact their teaching and learning. Some teachers expressed the desire to know more about their learners and thought that if they did, they could reach out to more of them:

"There is a language barrier, as learners do not understand me. Language is a big barrier" (Teacher 4).

"Learners are not taught in their home language, which is a huge problem. I am not familiar with their culture. If I knew more about them, I could have reached out to more learners" (Teacher 6).

"If we could teach them in their home language, it would be a great advantage for us and the learners" (Teacher 3).

One educator felt there was no need for culture and considered it an issue that should be excluded from the class.

5. Discussion

The findings present the factors that influence the academic performance of Grade 7 learners in mathematics classes. The factors were divided into psychological, social, and academic categories. Psychological factors include learner resilience, learner enthusiasm, learner disengagement, learner anxiety, and learners' behaviours and confidence in the classroom. The social factors included school, family, and community issues. School issues fall into two categories: peer relations and learner-teacher relationships. Academic factors included a lack of comprehension of mathematical concepts, mathematical learning difficulties, and teaching mathematics in the learners' second language.

This study demonstrated resilience as a psychological factor influencing the performance of Grade 7 learners in mathematics at the selected primary schools. They worked hard and accepted responsibility for their learning. Learners were happy in the class and displayed this by doing what was expected of them. Teachers professed that despite learners' difficulties during COVID-19, they remained positive and maintained their psychological balance. Despite harrowing conditions, resilience has been conceptualised as learners' ability to succeed (Hutauruk, Priatna, 2017). A resilient learner can persist through complex mathematical issues (Hafiz, Dahlan, 2017). The teachers who participated in this study said that learners persisted with a problem until they had mastered a particular mathematical concept taught in the classroom.

The enthusiasm the Grade 7 mathematics learners display in the classroom was found to be a psychological factor influencing their performance. The learners' enthusiasm during classroom activities reflects how successful they are. A learner who fully engages in class activities displays enthusiasm. A study in Tanzania established that learners' enthusiasm can be enhanced when they are interested in using technology (Uchidiuno et al., 2019). An Iranian study supports that the classroom environment determines learner enthusiasm (Khajavy et al., 2018).

This study found disengagement to be a psychological factor influencing the performance of Grade 7 learners at primary schools. Sometimes learners are not disengaged, but their results show that they are not working, as they are not at a developmental level where they can clearly express their feelings; thus, they show their feelings by acting out and being disengaged. In this context, disengagement does not mean behaving badly; they are simply disinterested in what they are being told to do. When learners are disengaged from the class, their performance will be seriously hampered (Engels et al., 2019).

Learner anxiety was found to be a psychological factor that tended to influence Grade 7 learners' performance in mathematics at the selected primary schools. Anxiety involves the learners anticipating that something bad will happen to them. The study showed that learners could manifest anxiety due to COVID-19. The teachers expressed that those learners felt anxious, and despite this, they still came to school. It was highlighted that pressure from teachers and parents regarding mathematics could contribute to the learners' anxiety. Segumpan and Tan (2018) reiterated that teachers might be partly responsible for the anxiety learners experience in the classroom. Similarly, Boaler et al. (2019) emphasised that when learners are under pressure and stress, their brain function is not at its best due to anxiety.

This study found that as a psychological factor, the behaviours of Grade 7 learners in the classroom influence their performance in mathematics classes at primary school. They act out by obtaining substandard results. Some learners sit passively throughout the lesson and then ask a friend for help. Such learners seldom misbehave. Thus, teachers should be able to control learners' behaviours (Tran, 2015). One teacher with over 25 years of teaching experience said, "I wish they were as behaved as they seem because their results show that they do not understand the concepts being taught in the class". When learners were exposed to the idea that they 'can' do mathematics,

this positively influenced their performance (Boaler et al., 2019). Teachers in this study mentioned that learners struggled to cope with everyday issues in the class.

Learner confidence was a psychological factor possibly influencing Grade 7 learners' performance in mathematics classrooms at primary school. Learners' confidence is a major factor that impacts their performance. Several factors can be attributed to learners' confidence in the classroom, including academic success, personal history, and individual differences (Wentzel, Miele, 2016). The participants in this study also alluded to this reality, acknowledging that their attitudes and attributes in the class directly affect learners' performance. Learners who showed confidence put more effort into their work, enhancing their performance (Velayutham, Aldridge, 2013). The link between what learners think of themselves and their performance is a factor that highly affects their performance in mathematics. Learner confidence increases when they have adopted the skills needed in the classroom (Bernales, 2016). This study found that learners' mindset distinctly affects their confidence level in the classroom.

This study found peer relationships to be a social factor influencing Grade 7 learners' performance in mathematics at primary school. Peer interaction among learners could impact their learning in mathematics when their friends encourage them to be studious to succeed. However, it may negatively impact learners when their peers influence them to misbehave. It could be positive when it benefits learners by promoting the values of academic and social relationships at school. According to Camerini and Schulz (2018), peer relationships are necessary for developing learners' social well-being at school.

This study also found that teacher-learner relationships might be a social factor influencing the Grade 7 learners' performance in the mathematics classroom at the selected primary schools. These relationships contribute directly to learners' engagement with the content and knowledge of the subject in classrooms (Yuan et al., 2018). The literature demonstrates that teachers' relationships with their learners enhance learners' academic performance and achievement (Sneyers et al., 2018). Teaching new concepts with great enthusiasm and confidence could enhance the learners' preparedness and confidence to work hard and prosper. As the teacher-learner relationship impacts learners' performance, teachers need sufficient support and must acquire the required skills to support their learners (Albright et al., 2017). A teacher's positive attitude makes the atmosphere in the class positive and conducive to teaching and learning.

Family issues were also a social factor that possibly influenced the Grade 7 learners' performance in mathematics at primary school. The family unit is essential, as it shapes the holistic well-being of learners. When the family structure protects a child, it becomes easier for that child to navigate worldly problems. Learners who believe they have their parents' support do better academically as they are supported emotionally and socially (Peteros et al., 2019). Providing social and economic support to families is necessary to enhance learner engagement in the classroom (Asongu et al., 2019). It affords them some sort of security. Parents' working hours do not allow them to interact with their children and give them emotional support. The literature depicts learners with family support as more capable of achieving higher academic scores than those without it (Schulze, Lemmer, 2017).

This study found that community issues are a social factor determining Grade 7 learners' performance in the mathematics classroom at primary school. The social ills that a society experiences spill into the school system because the learners come from the same community. Learners who reside in socially unfavourable conditions struggle at school because they constantly fight for survival (Urbina-Garcia, 2019). They come from poor communities where the members have not been able to secure a better life for their children. A study conducted in Brunei proposes that for a learner to succeed, the focus must be on the communities surrounding the schools (Abdullah et al., 2018). An African study found that interventions are necessary to enhance learners' living standards (Asongu et al., 2019). Learners come from different backgrounds, and these differences culminate in them fighting when they are made to sit together in the same classroom.

The Grade 7 learners' lack of comprehension of concepts was found to be an academic factor influencing their performance in the mathematics classroom at primary school. Learners may be able to learn retention of mathematical facts, but failing to comprehend the concepts means that they cannot understand what is being taught. It would be excellent if teachers tried different strategies to get learners to understand that fractions and geometry are more complicated (Roesslein, Codding, 2019). The conceptual foundation has not been adequately laid down, so the learners struggle with mathematics in this phase.

This study found mathematics-related learning difficulties to be another academic factor that influences Grade 7 learners' performance in the mathematics classroom. Mathematical learning difficulties are prevalent among learners because teachers might use ineffective mathematical teaching strategies. An African study supports the idea that upgrading technology will foster educational enhancement in Africa (Samarakoon et al., 2017). Learning needs to be differentiated, as it gradually becomes abstract, taking advantage of what learners know and introducing what is not known (Fitriani et al., 2018). Teachers must adapt and modify their strategies to match learners' learning needs.

It was also found that teaching mathematics in the Grade 7 learners' second language is an academic factor that could influence their performance in mathematics at primary schools in South Africa. According to Choi et al. (2018), learners should receive intervention in the second language early to enhance their mathematical ability later in their schooling careers. Most of the learners in this study spoke English as their second language.

6. Conclusion

Based on the findings from this study, it is recommended that mathematics teachers create a conducive and stimulating atmosphere at their schools, regardless of learners' backgrounds, ethnicities, languages, locations, and gender. Mathematics teachers should consider increasing their interaction with learners who perform poorly in the subject and recommend them for involvement in make-up classes, tutorial classes, or special coaching. Teachers should encourage learners who personally want to enhance their achievements through questioning, better interpersonal relationships, and giving them special attention.

The study has highlighted the psychological issues that rural South African learners face in Mathematics classes. Much emphasis is usually placed on more populated schools; thus, this is an advantage of this study. The need for psychosocial intervention has been brought up to inform authorities. There is also a great need for academic intervention in the schools. The last issue that was raised is that there is a need for teachers to upgrade their teaching strategies.

Limitations of this study include the fact that the researchers collected data from six schools, one of which was private, and five public schools, all of which are under the jurisdiction of the State. Thus, the results cannot be generalised to the entire South African population. The study also focused only on one exit grade, Grade 7, when learners transit from the Intermediate Phase to the Senior Phase, but there are two more: the Foundation Phase (Grade 3) and high school (Grade 9). The study was also only conducted in the Frances Baard District, a rather more rural province than other provinces in South Africa. The study sample was smaller than required in a qualitative approach, limiting the study's results. This study also focused only on one subject, mathematics, and could have benefitted from exploring more subjects.

7. Declarations

Ethics approval and consent to participate

Institutional approvals and participants' consent were obtained before the commencement of the study. The authors ensured that the study met the requirements per the Declaration of Helsinki - Ethical Principles for Medical Research Involving Human Subjects, developed by the World Medical Association in 1964.

Consent for publication

All authors read and approved the final version of the manuscript for publication and agree to be accountable for all aspects of the work, ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Availability of data and materials

Available upon formal request to the corresponding author.

Conflict of interest statement

The authors report no conflicts of interest.

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Authors' contributions

All authors contributed equally to this work. They collaboratively developed the concept and design of the study, collected data, and contributed to the analysis and interpretation of the collected data. Additionally, all authors were involved in drafting, revising, and finalising the manuscript.

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