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INCLUSIVE TEACHING STRATEGIES: EXPLORING GRADE 10 ALGEBRA LEARNING IN TWO TOWNSHIP SCHOOLS IN PINETOWN DISTRICT KWAZULU-NATAL PROVINCE

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Abstract

This article draws on social constructivism theory to understand the Grade 10 learners' experiences of learning algebra in two High Schools in the Pinetown Education District, KwaZulu-Natal Province. It adopted a qualitative, case study research methodology, using qualitative questionnaire and semi-structured individual interviews for data collection. Findings reveal the difficult experiences the Grade 10 learners encounter in learning algebra in class. It shows that some of the learners found learning algebra boring because of teaching approach and language limitation. The study recommends further research, the need for Grade 10 mathematics teachers to employ variety of teaching strategies in teaching algebra in class, and importance of using learner's home language in teaching algebra and mathematical concepts to enhance participation and better understanding of the topic.

Keywords

Algebra, Instructional Strategies; Learner-Centered Approach; Learning Experiences.



1. Introduction

In the global context, learners are reported as under-achieving in mathematics (Foong & Ee, 2002; Agaliotis & Kalyva, 2019; Shamaki, 2015). Kumah & Wonu (2022), explain that learner underachievement in mathematics is usually associated to poor teaching of mathematics in schools. However, findings indicate that learners' poor mathematics achievement is as a result of the outdated teaching practices (Colbert, 2021) and lack of basic content knowledge result in poor teaching standards of mathematics in schools (Copur-Gencturk, 2021; Chand, *et al*,2021). This suggest that there is a possible explanation of the connection between poor learners' achievement in mathematics and poor teaching of mathematics is perhaps the lack of teaching strategy in classroom delivery of the subject. Therefore, a good teaching strategy is known to have the potential of not only ensuring adequate delivery of subject content by the teacher, but perhaps more importantly, of making learning concrete in ways that connect to the lives and lived experiences of the learner (Voltz *et al.*, 2010). In South African schools, mathematics teachers are often seen as a key in learners' performance in mathematics. However, an experienced teacher has a richer background of experience to draw from and can contribute insight and ideas to the course of teaching and learning (Bwenvu *et al.* 2020; Onyenyili, 2018). Despite the different methods suggested by the South African Departments of Basic Education (DBE) through the CAPS policy to be employed by mathematics teacher in order to effectively teach this subject to the learners, several studies confirm the persistent

of learners' poor performance in mathematics education (Department of Basic Education, 2013; Spaul, 2016). The study by Oliphant & McCarthy (2013) reveals that there is an increase in the number of learners underperforming in education, particularly in the area of algebra). This shows a challenge in the learners' performance from Grade 9 to matric. More so, the study by Spaul (2015) reveals that learners encounter problems in algebra during their Grade 10 level in the FET phase. Spaul (2015) further indicates that most learners drop out from the mathematics classroom in their Grade 10 and 11 classes.

1.1 Significance of the Study

Studies suggest that mathematics teachers emphasize procedural knowledge as opposed to conceptual understanding of the mathematical concepts (Rittle-Johnson & Jordan, 2016; Lawson, 2007). This suggests that if mathematics teachers emphasize procedural knowledge to teach Algebra, then they might not be using a variety of teaching strategies such as problem-based teaching supporting conceptual understanding. The idea is that learners not only have to retain ideas, but relate them to other things they encounter, using each new situation to add nuance and sophistication to their thinking. These kinds of teaching strategies promote deeper learning. Usiskin (2004) contends that lack of depth in understanding of algebra may result in the learner being unable or inept in applying or even understanding ideas and concepts in related areas of the sciences, economics. This article tends to explore how Grade 10 learners experience the

teaching strategies employed by their mathematics teachers in the teaching of algebra in class. This study focuses on Grade 10 learners because in South Africa, Grade 10 is the entry grade of the Further Education and Training (FET) phase.

1.2 Perceptions about teaching and learning of mathematics

Mathematics is perceived as a challenging subject, which is only accessible to few. Hence, there is a perception that mathematics is for the intelligent ones or for those who have inherited mathematical ability. It is also perceived as a subject meant for boys only, as boys are falsely perceived to do better in mathematics than girls (Mutodi & Ngirande, 2014). These perceptions could affect the attitude of learners, especially girls towards learning of mathematics. Moreover, studies have revealed that mathematics teachers concentrate more on procedural content knowledge than conceptual knowledge (McGehee, 1990). Also, learners are required to memorize methods and procedures in mathematics and this inevitably makes them believe that mathematics is mainly a matter of following disconnected rules and symbols (Hiebert & Carpenter, 1992). Furthermore, Boaler (1998) findings on the experiences and understanding of open and close mathematics reveals that learners who learn mathematics in an open, project-based environment developed conceptual understanding. This provides them with advantages in a range of assessment and situations, while learners who followed a traditional approach developed procedural knowledge that was of limited use to them in unfamiliar situations. Boaler (1998) further

argues that the traditional approach that focus on procedures is disadvantageous to learners because it encourages learning that is inflexible. Mapolelo (2009) study on learners' experiences with mathematics teaching and learning identified that mathematics was lecture oriented. In agreement, Hlalele (2012) explores rural high school learners' experiences of mathematics anxiety in academic setting also found that learners always experience anxiety due to the kind of teaching strategies employed by their mathematics teachers. He then recommends the need for mathematics teachers and schools to implement good teaching strategies' that will alleviate the effects of mathematics anxiety.

1.3 Learners experiences of teaching and learning of algebra

According to Kunwar (2020) learners' difficulty in learning algebra in class are due to the teacher's aversive teaching approaches. Studies on learning experiences of learners identified that many learners experience difficulties in learning algebra at high school due to mainly teaching approach adopted by teachers (Chow, 2011). Furthermore, studies indicate that teachers' medium of instruction contribute to learners' lack of interest in learning algebra and difficulty in understanding the concepts (Agustyaningrum *et al.*, 2021). Barrios, Lopez-Gutiérrez & Lechuga (2016) also maintain that the challenge learners experience in learning of mathematics especially algebra is partly associated with the medium of the instruction in class. Similarly, Mpho (2018) argue that mathematics teachers are not ready to apply varieties of teaching methods in their teaching and resort to the use of a particular teaching method

that makes the lesson boring and uninteresting. In addition to un-engaging lessons, the nature of the topic is very challenging and calls for diversified and suitable methods for teaching algebra to make the learning more engaging and relevant to learners' everyday life reality – where they can make connection with what is learnt in clear and their real life experiences. Some of the points raised here constitute into barriers that inhibits learners from learning and understanding the topic as it should be. Furthermore, Mupa & Chinooneka (2015), argue that teachers of this subject do not go extra mile to make learning easier for their learners. Teachers are not able to clearly explain the subject concepts to their learners by giving accurate illustrations and examples to make them understand better. Jourdain & Sharma (2016) argue that language barriers are one of the challenges the Grade 10 learners experience in learning algebra in class. Studies have shown that South Africa battles with the dilemma of the use of mother tongue and English language as medium of instruction in teaching and learning mathematics and mathematical concepts in class (Chikasha, 2021). In South Africa, many learners are non-English language first speakers but are required to take their school examinations in English language (Leung & Valdés, 2019). This is to say that the teachers are using abstract language that does not connect to their reality. On the other hand, in South Africa, majority of the high school learners are not motivated to learn algebra due to lack of understanding of the concepts (Mabena *et al.*, 2021). Although, the key findings of a study conducted by Williamson & Paulsen-Becejac

(2018) indicate that the learners who engaged in peer learning achieved their learning outcomes successfully. Many studies indicate that some learners have positive learning experiences especially when they learn with peers (Hurst *et al.*, 2013). This includes learners who share ideas on the concepts of the subjects they do in class. When learners work in peers, they learn the value of peer interaction leading to the development of teamwork and problems solving skills (Herro, McNeese, *et al.*, 2021). Similarly, the study of (Ghavifekr, 2020) added that learners who are involved in peer learning acquire professional skills. Studies indicate that South African learners who participate in the peer sessions had positive learning experiences and developed skills. For example, problem solving skills while they work with peers. Drawing from the above, it will be proper to consider team and collaborative work/engagement among learners as one of the effective strategies in teaching and learning of algebra in class. This strategy should be adopted by teachers for more effective process of teaching and learning algebra in class.

1.4 Need for a variety of teaching strategies in teaching algebra

The primary purpose of teaching at any level of education is to bring a fundamental change in the learner (Tebabal & Kahssay, 2011). It is important that mathematics teachers always bear this purpose in mind when teaching algebra in class. Aldossari (2018) maintains that the education system still faces many challenges because of the wide spectrum of learner differences, needs and concerns and patterns of thinking. Studies indicate

that the greatest factors affecting learners' ability to learn and comprehend algebra is the teaching methodology employed by teachers in class (Dorgu, 2016). Furthermore, Sanger (2020) found that many teachers tend to structure their teaching strategy directly by their own interpretation without considering the diversity and different learning abilities that exist among learners in class. Thus, teachers are not only challenged to identify certain instructional strategies but also challenged to develop the ability to apply the strategies that are appropriate in teaching their learners. Thamara & Narayana (2015) maintain that a 'strategy' is a procedure which serves as a way of reaching a goal. Therefore, teaching strategy should include sequences, choices made and steps taken in attempting to reach and accommodate a variety of learners learning abilities and styles in class. According Bhalli, *et al.*, (2016) teaching strategy is a method, techniques and procedure a teacher uses during instruction to achieve a desired learning outcome. Furthermore, Prawat (1992) maintains that a teachers' teaching approach/ strategy is always aligning with his or her philosophy of education. Also, studies by Ayeni (2011) and Ozcan (2021) argue that the teaching approach that a teacher adopts is one factor that may affect learners' achievement and facilitate high standards of learners' outcomes. Therefore, there is a need for a teacher to set patterns, routines and help the learners to get relaxed and be able to catch up with the flow of the lesson. Therefore, to successfully achieve an effective teaching and learning of algebra in schools, teachers should employ a variety and more inclusive teaching strategies that

will cater for the variety of learning abilities and styles among learners in class in order to enhance/enable learners to grasp the content and concepts in algebra.

1.5 Different teaching approaches employed by teachers in class

According to Tularam & Machisella (2018), teacher-centred traditional teaching approach entails teacher centered instructional methods where learners are taught in such a way that they are more of passive listeners. Also, according to Liu and Long (2014), this teaching approach entails that learners are just listeners. Thus, the teacher asserts control over the material that learner's study (Sawant & Rizvi, 2015). Coe *et al.*, (2014) maintain that traditional teacher-centered teaching approach is the most common teaching approach employed by teachers in many classroom contexts. Furthermore, in a traditional teacher-centered classroom, teachers introduce concepts in algebra and learners are expected to listen and understand the concepts (Osei, 1998). Consequently, this becomes a boring learning process for learners as they find it difficult to meaning of the concepts and to connect them to their everyday realities (Mpho, 2018). Furthermore, studies also reveal that teacher-centered traditional teaching approach places emphasis on rules, as such, learners are made to learn only rules to solve problems in algebra (Liu & Long, 2014). On the contrary, effective teaching and learning entails a teaching method that engages the learners as primary participants in the learning process, and enables them apply what is taught in real live situations (Zakaria, *et al.*, 2010). On the

other hand, Serin (2018) is of the view that many teachers have always strived for a more ideal teaching method for more effective teaching and learning process in the classroom. During the last decades, teacher-centered teaching and learning method has been replaced by learner-centred teaching and learning method (Weimer, 2002). However, for many years the traditional teaching method of teacher-centered approach has been the dominant method of teaching in many contexts (Ahmed 2013). For instance, Soleimani & Parvaneh, (2017) highlight that for many years, traditional or old approach of teaching and learning, which is the teacher-centered approach has been the dominant teaching approach in Iran. In South Africa, the National Department of Education introduced the curriculum and Assessment Policy Statement (CAPS) for a more effective teaching and learning in various subjects including in the teaching and learning of Mathematics across the grades. CAPS requires that teachers adopt a learner-centred approach of teaching and learning such as, role-play, inquiry-based approach, constructivist teaching, cooperative learning approach, and classroom discussion method in order to ensure learners participate actively during the teaching and learning process (DoE, 2011).

1.6 Importance of learning algebra in schools

Studies have shown that algebra plays a major role in the way learner's access educational opportunities in a variety of science disciplines (Gronmo, 2018). Learner's ability to master and understand the rules and the concepts in algebra is a key success in future mathematics courses

including geometry and calculus. In line with this, Makonye & Stepwell (2016) are of the opinion that elements of algebra are found in all mathematics topics including geometry, statistics, trigonometry, vectors, and metrics which are covered at basic high school Grade 10 level curriculum. However, Gronmo (2018) noted that learners need algebra to understand and possess mathematical skills of reasoning and to make necessary connections with daily living experiences, they need algebra. However, Star *et al.*, (2015) argue that such skills of reasoning are sometimes described and perceived as imposing high cognitive load or challenging working memory which can interfere with learner's ability to learn. Therefore, Yerushalmy & Chazan (2008) recommend that learners should have access to algebraic reasoning since the ability to reason algebraically is a prerequisite for participation in higher levels of mathematics. From these viewpoints, the researcher argues that developing strong knowledge of algebra in high school is important for success in learners' mathematical development (Rittle -Johnson, 2017). According to Mhakure *et al.*, (2014) the lack of competence in algebra, poses a problem in learning mathematics for many learners in school and is a major global concern. Algebra remains a substantial problem for many learners in high school mathematics in South Africa and in other countries (Pournara *et al.*, 2016). Furthermore, Ramirez, *et al.*, (1991) suggest that teaching the learner mathematics without ensuring a good understanding of algebra is comparable to "a child immersed under water in order to teach her to swim". Thus, they argue that

algebra is a key topic in learning mathematics notwithstanding the fact that learners complain that it is challenging. Algebra forms the basis of high school mathematics. And other topics including concepts in mathematics are dependent on competency in learning algebra (Permata *et al.*, 2019). It can be argued that a good foundation in algebra at Grade 10, which is perceived as the level where learners advance their learning, higher than elementary algebra, build up advanced algebraic concepts to develop competency in mathematical algebra concept. However, study conducted by Usiskin (2004) found that lack of in-depth in understanding of algebra may result in the learner being unable to understand ideas and concepts in related areas of the sciences, economics, business, and to make wise decisions. It is therefore germane that the ways in which algebra is taught and learnt in high schools' mathematics, particularly at Grade 10, is given attention. Exploring the learners' experiences of teaching strategies, in algebra at Grade 10 level, is considered as a critical step, given the context of poor mathematics performance in the KwaZulu-Natal province. Hence, the next section explores what a teaching strategy means and the diverse teaching strategies that could be employed by mathematics teachers to teach learners algebra.

2. Social Constructivism as the Theoretical Framework of the Study

This study employed Social Constructivism as the theoretical framework. Social Constructivism theory was developed by Lev Vygotsky in the year (1978) who strongly suggests that individual understanding improves by the virtue of social

interaction. Thus, social constructivism theory is a theory of knowledge that examines knowledge and understandings of the world that are developed jointly by individuals (Aminah & Asl, 2015). Similarly, Mohammed & Kinyo (2020) are of the same notion that through sharing and social interaction, ideas are developed. In the same line, Ernest (2006) is of the view that social constructivism theory recognizes that learning and understanding are constructed by social interactions. Similarly, Okita (2012) maintains that learners develop knowledge and understanding through social interactions with their peers. Thus, Social Constructivism states that knowledge is co-constructed and that individuals learn from each other in the process (Thompson, 2013; Lialikhova, 2019). Furthermore, Vygotsky (1978) and many other studies (Salomon & Perkins, 1998) argue that learning only takes place with the help of peers who are more knowledgeable thus contributing to the social aspect of the theory. Also, in the context of learning, Bredo (1997) posits that social construction of learning presents learning as a social and cultural process that occurs in the context of human relationships and not just in the heads of individual learners. According to Brophy (2002) learning involves negotiating understanding through dialogue or discourse shared by two or more members of the community. In this study, social constructivism theory enabled a deep understanding of the participants' experiences of difficulties in learning algebra in class. Furthermore, the theory offers direction and illuminates the findings of this study since it evolves into a process that seeks reality from

individuals' narratives of their experiences (Cilesiz, 2009; Neubauer, *et al.*, 2019). Added to this, Cuthbertson *et al.*, (2020) argue that the social constructivist theory recognizes that individuals seek to understand their world and develop their own meanings from their lives experiences. Thus, learners' experiences in the classroom is a real source of knowledge, a kind of cultural capital that can be tapped by teachers to improve the pedagogic practices (Schall *et al.*, 2020).

3. Research Design

3.1 Research Site

The study was conducted in two schools in the Pinetown Education District in KwaZulu-Natal Province. The two schools are located in two separate townships under the Pinetown District. In South Africa, a township is referred to underdeveloped part of an urban area, usually close to an industrial layout. Townships are therefore, communities where low income earners and families of unskilled factory and mine workers live. These workers move from the townships to work in the nearby factories and mines. Townships are mostly made up of black and coloured communities. Schools located in townships are commonly referred to as 'township schools'. The two schools used for study fall within this category as they are located in the township settings and are therefore township schools. Township schools mostly serve the disadvantaged black and coloured working class and poor communities. Townships schools across South Africa are usually characterised by lack of adequate teaching and learning resources especially when compared to the so called Ex-Model C schools. Ex-model C schools

on the other hand, refers to schools that served only the white communities –formerly for only white learners. These schools are located in the suburbs and city centres, and they are characterised by well-equipped teaching and learning resources. Ex-Model C schools also usually have highly qualified teachers with good teaching experience. Unlike the Ex-Model C schools, the townships schools most often lack qualified and experienced teachers, especially for mathematics and science subjects. In many instances, township schools are mainly staffed with recently qualified teachers with limited professional teaching experience. Given that the two schools were used in this study, and for the purpose of anonymity and clarity, the two schools were tagged as school A and school B respectively. School A was a public mixed school - meaning that the school was made up of boys and girls. Teachers in the school were employed and paid by the South African Department of Education. Learner enrolment stood about 860 learners and 36 teachers. School A was characterised by large class size. The school was made up of learners from low socioeconomic class – meaning that the learners were mostly from working class families (families of unskilled factory workers). School A is made of black learners and teachers as the school is located in a black community. School B like school A was also a public mixed school. Teachers in the school were also employed and paid by the South African Department of Education. Learner enrolment was about 925 learners and 30 teachers. School B had a better class size than school A. Also, school B is better resourced than school A, with classrooms

better equipped with teaching and learning resources. Like school B most of the learners come from low income family backgrounds. Like school A, school was made up of black learners and teachers as the school is also located in a black community. The two schools were selected for this study because of the schools' willingness to participate in the study. Furthermore, the schools represent typical South African school contexts with the existential teaching and learning challenges present in most public schools in South Africa.

3.2 Sampling

Purposive and convenience sampling technique were used to select the two schools for the study. The participants in this study were comprised of twenty grade 10 learners and two mathematics teachers. Ten learners and one teacher were selected from each of the two schools. The participants were comprised of ten male learners and ten female learners. Five male learners and five female learners were selected from each school. Two teachers (one female and one male) were selected – one from school A and one from school B. The choice of the participants for the study was based on individuals who happen to be available and accessible, and who indicated willingness to take part in the study. Also, the choice of this study to focus on the two selected schools was based on the schools' mathematics pass rate in the grade 12 matric examination in the past years.

3.3 Study Methodology and Data Collection Methods

This study adopted a qualitative research approach. Qualitative research aligned with this study because of its credence to comprehend human experiences, behaviours, feelings and emotions. Qualitative research approach employs descriptive accounts of experiences collected as data from research participants' narratives given that people are storytellers and lead lives that are full of stories as opposed to data or information expressed numerically (Nnadozie & Morojele, 2023). In this study, qualitative approach was employed to explore in-depth the Grade 10 learners' experiences of the teaching strategies used by their mathematics teachers to teach algebra. Thus, the choice of this approach is that it enabled to access the thoughts and feelings of the research participants and the ideas regarding the Grade 10 learners' experiences of the teaching strategies used by their mathematics teachers. In this way, it enabled an in-depth understanding of the teaching strategies and the learning of mathematical algebra in South African schools. The data in this study was collected through questionnaire and individual semi-structured interviews. Questionnaires were given to the participants with set of questions which the participants responded to. Participants were given sufficient time to carefully go through the questions, ask questions for clarifications, and to adequately respond to the questions. Participants were provided guidance on how to respond to questions in questionnaire to enable them not to deviate from the focus of the study and to provide needed responses to the questions in the question. The purpose of the questionnaire was to enable basic understanding of the participants' thoughts

and feelings regarding their experiences of the teaching strategies used by their mathematics teachers. Individual semi-structured interviews were employed to deepen the data collected through participants' questionnaire responses. Individual interview with the participants took different length of time over a period six weeks. With permission from the participants, the use of a tape recorder helped in the accurate capturing of what each participant said and to make up for data not recorded in the note. Also, field notes were used to record the individual interviews with the participants especially the participants' emotions and body language. English Language was the medium of conversations during all the individual interviews with the participants. This did not create any linguist restrictions as all the participants were conversant with this.

3.4 Data Analysis Procedures

A qualitative data analysis was followed to drive patterns and themes in the data. Also, keeping with Brown and Clarke (2006) steps in data analysis necessitated reading and re-reading the text several times for accuracy in interpretation. This was followed by organizing and re-organizing the data collected, linking pseudonyms with informants and identifying sub-emerging themes related to the focus of the study. Data was then coded and meaningful similar data grouped together based on the overarching theme. Furthermore, the researchers concentrated on defining each theme and naming them, and looking at what is interested about the themes. Lastly, theoretically informed emergent themes from all the data were then finally coded, analyzed and

discussed based on debates in the field and creative interpretive abilities of the researchers.

3.5 Ethical Considerations

As a way of recognizing and to respect the participants' rights, ethical issues concerning the study was adequately observed. A written permission was sought and obtained from the principals of the two schools used in this study, through a written letter stating the purpose of the study. Ethical clearance was then obtained from the University of KwaZulu-Natal research office. Letters of consent were written to the parents/caregivers of the selected participants for the study explaining issues of confidentiality, privacy and voluntary participation. The consent of the learners (participants) was sought as the study considers learners as competent human beings who can decide on issues that concern their lives (Nnadozie & Morojele, 2023). Also, the consent of the two teachers who participated in the study was sought and obtained. Trust and respect was maintained throughout the research process and with all the research participants. The participants were also informed of their right to withdraw from the study if and when they so desired without any undesirable consequences. In order to maintain confidentiality, pseudonyms are used in this study to represent both the schools and participants.

4. Results and Discussions

The findings unveiled aspects of the experiences of the grade 10 learners in the teaching strategies used in teaching algebra by their Mathematics teachers. The findings reveal that all twenty learners who participated in this study from the two schools have similar experiences of difficulties in

understanding the method and concepts in algebra. The findings are organized to explore and address the grade 10 learners' experiences of the teaching strategies used in teaching algebra by their Mathematics' teachers

4.1 Learners' Negative Experiences of the Teaching Strategies

The findings revealed the participants' negative experiences in the teaching strategies their teachers used in teaching them algebra. This has great effect on the learners' interest in learning algebra as a topic and their understanding of its concepts and methods. This also impacts on the participants' overall performance in Mathematics and other sciences.

All learner participants in this study both in the interview sessions and in the questionnaires responded that they experience learning algebra as a boring topic because they do not understand the basic concepts and methods in the topic.

4.1.1 Algebra is boring

The findings reveal that the participants experience their algebra lessons as boring. Accordingly, their lessons were unexciting, and the learners were not motivated enough to engage both the learning content and classroom learning interactions. The participants indicated both in the interview sessions and in the questionnaires that they felt so bored each time during the lessons because the teacher neither interacts nor explain how they arrive at the right answers. Learner 4 (School A) *I really don't like the way our teacher teaches us. I can't say I understand a thing he taught us on Algebra. Sometimes he makes it boring. All I can say is most of the time in class I feel like I want to*

sleep, the lessons are not exciting at all especially as I don't understand how our teacher is arriving at the answer to the problem he is solving on the board. Learner 7 (School B) I always get bored during the class. He (the lesson teacher) is hardly audible, no one could hear him well, just like mumbling to himself. Not even when he tries to explain the concepts, we can barely understand his heavy accent. Our teacher is a foreigner you know Eish, he can't say these things in isiZulu and there also is the problem. Learner 9 (School B) He (the teacher) usually gets angry and frowns at us when we complain and ask him to repeat what he said after we didn't hear him well. Secondly, it's always difficult for me to answer questions because there are things, I could only say in Isi-Zulu, so I felt so bored in the classroom since he does not like it when you try talk in Zulu. The participants perceive the topic 'algebra' as a difficult one, pointing to the teacher as key to making it uninteresting. According to the participants' responses in the questionnaires, they struggle to follow what their teacher is teaching and how the teacher arrives at the right answers. This is not helpful, when their teacher, as learner 9 puts it, "usually gets angry and frown at us when we complain and ask him to repeat what he said after we didn't hear him well" The participants in their questionnaires responses echo each other in their assertion that the topic is 'boring', given the combination of the situations where;

1. They are unable to understand some concepts,
2. Their teachers hardly explain in a way they can understand,

3. They find the lesson un-engaging because they are not allowed to ask questions

4. Their teachers do not encourage conversation to clarify learning.

One of the participants from school B (Learner 5) comments that algebra lessons are boring where the teacher is not audible when explaining the algebraic concepts. This makes the teacher- learner communication ineffective, which hinders the learner interactions with both the lesson content and their teacher. Kathard & Pillay (2015) suggest that quality of teacher-learner interaction impact mathematics learning in high school. These studies affirm the findings in this present study, and together suggest the key role effective teacher-learner communication in classroom teaching of high school mathematics plays. As the findings further suggest, learners in this study experience their learning of algebra as boring because they were not actively engaged as they barely hear what their teacher says. Furthermore, Ying, *et al.*, (2020) also identified language barrier experienced by Grade 10 learners as cause of less commitment to learning algebra. The findings of this present study show language barrier as one of challenges the Grade 10 learners experience in their classroom that affects their understanding of algebra. The study participants found their algebra lessons boring because their teacher usually gets angry whenever they complain about the language and sought for the concepts to be explained in their first language which is isiZulu. One of the participants, points to their teacher's limitation to speak isiZulu as the barrier. Accordingly, the interaction in the classroom is influenced by this limitation because

the teacher could not answer questions or engage their conversation in the first language. Yet, there are certain things their teacher could not explain to their understanding in English but could have easily explained if expressed and made clear in isiZulu for all learners to understand. The above reveals that some of the learners found algebra boring, owing to an array of factors, some related to language of instruction. The findings resonate with Djam'an, (2021) studies that suggest that learners in high schools and colleges in South Africa find algebra lessons in mathematics a boring topic. Other studies (Agustyaningrum *et al.*, 2021; Gafoor, & Kurukkan, 2015; Li *et al.*, 2013) document learners' experiences of learning algebra as boring due to the teacher related issues and teaching styles. When probed further to find if it is only algebra or they also find learning other mathematics topics and the concepts boring, the participants' responses were revealing. They confirm that some other topics in their mathematics are also boring, because if their teacher fails to make the lesson come alive by engaging conversation and break the concepts down in ways they can understand or use their first language to make clearer. There was communication barrier between the mathematics teachers and their learners since the Grade 10 learner could only actively interact and participate in the lesson using isiZulu which their teachers do not use to clarify and make the lesson topic interesting and easy to follow. In contrast, the study by Sharma (2019) reported that teachers use English to teach algebra because they struggled with how to use their home language to maximize learning in their classrooms.

Regardless, in the context of this present study, it is contentious to assert that the teachers' use of English, which is the learners' second language, 'maximizes' learning in the Grade 10 algebra lesson classroom. It would be interesting to explore this in future studies.

4.1.2 It's difficult to understand

Another theme that emerged is that algebra as a topic is difficult to understand. Pointing out that the methods their Mathematics teachers use to teach the algebra was not only difficult to understand. The participants in the interview session commented also that they find it not easy to apply what they learn to solve the problems on their own. Learner 3 (School A) *My worry is how I can understand the processes in Algebra to be able to solve expressions. I find it difficult to follow the teacher, and because I hardly participate during his (the teacher's Math lesson) class discussion, as I don't know anything to contribute. But it's not just me, some of my classmates feel the same though. It feels like wired if you (are) just there sitting and don't just get anything, yooo... it's difficult ehn...* Like Learner 3, several of the participants also comment about their difficulties in understanding the processes their teacher makes in solving algebra expressions. The participants in their questionnaire responses indicated that their main challenge is where their teacher does not clarify with them that they are following the learning but would go on and on while learners are lost and are not catching up. And because the learner teacher communication becomes de-linked when they are having difficulty to follow the lesson, the participants in this study say they find it

difficult to understand their teachers' method of teaching them algebra. This confounds their negative experiences of learning the topic. Learner 5 (School, B) *... is difficult to learn and understand because our teacher does not explain to us why he uses those methods and when to use them. So, I am always getting confused when am going through the examples of the work we did in class to do my assignments... it's just like, t's not there, I mean I can't see how to solve that...* From the participants' comments, they are finding the learning difficult because of the methods that their teachers adopt to teach the topic, which did not enable sufficient learner engagement with the learning. The teacher seems to be immersed in the solving of the mathematical problem thereby negating the underlining and important pedagogical requirement of teacher-learner communication involved in interactional and active learning (Hassana, 2022; Dine, 2021). Use of lesson approaches that ensure that content is well planned and designed, lesson is adequately developed, and tasks are well defined and followed is important in achieving a successful lesson, and in this instance, the algebra topic lessons. Simply due to the lesson method, in which the steps in solving algebraic expressions are not explained and broken down to the level that learners are able to understand, the teacher shortcomings lead to the negative experiences these learners have in learning the topic. However, studies (Baidoo, 2019; Samuel, Mulenga, & Angel, 2016; Marpa, 2019; Huang, & Kulm, 2012; Oliveira, *et al.*, 2021) suggest high school teachers do not have required knowledge of solving algebraic expressions. The

present study findings align with this suggestion as the participants' comments point to the esoteric nature of the teachers' methods of teaching that leaves their learners confounded and disengaged. The learners' loss of concentration in their learning, which for some mean 'difficulty' in learning algebra because of how their teachers teach them, leads to their conclusion that their teacher does not care about them, and that is, if the intended learning is taking place or not. Therefore, a similar view is taken from (Konicek-Moran, & Keeley, 2015) who suggest that the teachers should teach for a conceptual understanding. Learner 11 (School, A) *our mathematics teacher doesn't get to find out if we really understood what was being taught in the class or not, he just gives lessons and leave.* Learner 10 (School, B) *I find it challenging because since when we walk into the classroom and do mostly copy what our math's teacher writes, and as soon as time is up, our teacher leaves without minding if we understood well or not.* Learner difficulty to understand the lesson topic is affected by their level of engagement or non-engagement in the learning. Hence, Babincakova & Bernard (2020) explain that learners have difficulty understanding some of the methods their mathematics teachers use to teach algebra. They further argue that learner that struggle with understanding their teachers' lesson because of teaching methods also struggle to consolidate any learning that may take place (Babincakova & Bernard, 2020). A similar study (Mupa & Chinooneka, 2019) affirms that lack of proper teaching methods influences learners' understanding of algebra. Likewise, other scholars

like Magableh & Abdullah (2020) Juanda Shidiq & Nasrudin (2021) encourage use of appropriate teaching methods or teacher ingenuity to modify that in a manner that suits all learners in the classroom and enhance their understanding. Drawing from the participants' responses in the questionnaires and interviews, the present study confirms these findings that some mathematics teachers feel less concern about their classroom learners, that is, whether they understand what was being taught or not. Regardless, a plethora of other studies suggest that teachers apply different strategies to enhance their teaching of algebra and take time to see that their learners show understanding of the lesson before they leave the classroom (Sadita, *et al.*, 2018). However, in this present study, the teachers do not ensure learners understand what was taught in the classroom before they leave the class. In their verbatim responses, the participants' comments echo the literature, for examples, Khalid, *et al.*, (2020) and Cholily, *et al.*, (2020) that indicate learners' poor understanding of the algebraic concepts lead to negative experiences of learning the topic. As a foregoing observation, Sari & Yuce (2020) argues that the greatest challenges surrounding learning in public high schools is the inability of learners to understand what was being taught by their teachers in the classroom. This difficulty for the learner participants in present study is core to what they relate and express as negative experiences of learning algebra.

4.1.3 Teacher "goes on forever... School A"

The Grade 10 teacher responses suggest diverse teaching strategies they are using to teach the

Grade 10 learners' algebra. Given that learner perceptions of their teachers' content knowledge and subject competency matters for their levels of interest and engagement in the learning process and thus influence their learning experience, it was important to explore the teachers' teaching approaches. Learner 3 (School, A) ...I think he knows answers to the mathematical problems but seems to me he lacks the skill to impart this knowledge to us learners, you see. He goes on forever solving this thing without explaining it well to us. Sir, how do we know by just sitting there writing what he writes on the board? I want to follow him to know how is getting the right answers. The above responses from the learner participants show their negative experiences. Although, the approach in which teachers in mathematics utilize to teach their Grade 10 learners' algebra goes a long way in determining the success of the learners, the learners' responses show that their teachers' wrong approach or lack of appropriate approach that is supportive impact their experience of the learning negatively. Their responses also corroborate their teachers' which show what they explained as teacher-centred approach seems not to be working for these learners. Teacher 1 (School, A)...for me, teacher-centred remains the best approach for now due to the time shot to teach algebra to *get all* learners in the class practically involved. I use this approach as I want to benefit every one of the learners and make sure they all have inputs including the slow learners. In a vague allusion to same approach that Teacher 1 above commented about, he further adds. What is important especially when planning

to teach algebra is to devise a means for every learner in the class to be part of the lesson. What I do is to allow them to solve and provide answers then I do the corrections. So, I normally use this approach in my classroom so that all learners will participate, and no single learner will be left out. One thing that is coming out strong is the contradiction between learners' perception of their experiences of the algebra lessons and the teachers' assumptions of the learners' participation and full involvement in their class. The teacher participant in school "A" in the questionnaire response indicated being unaware of how delinked and lost their learners tended to be as he deploys the 'teacher-centered' approach in their teaching. More so, the teacher seems unaware of the dynamics the approach creates, and the resulting experiences that these learners' perceptions of their teachers' approach had in the learning environment. Yet, from the participants' questionnaire responses, it can be inferred that such teacher approach does not only inhibit learner active participation, but also negate promotion of the learners' fun and interest in the topic that are necessary to demystify algebra, make the learning exciting, relevant and concrete. Serin (2018) discusses issues of teacher-learner dynamic that play out in the classroom where teachers were, and or inadvertently assert they are, in charge. This present study resonates well with Mpho's (2018) assertion that when the classroom is teacher-centered, teachers tended to retain full control of activities. Hence, the learners' urge to express themselves, ask questions, direct their own learning, and interactively participation is overlooked in such teacher-centered teaching.

Thus, the combination of the teacher choice of approach to teaching algebra, in this case, the ‘teacher-centered approach’, and the apathy, disinterest and barriers to the learner active engagement that an unfitting approach results in, together plays crucial role in the high school experiences of learning algebra. This present study affirms these in negative experiences that the learner participants expressed, and the limitations of teaching approach can pose in terms of advancing the learning of algebra and indeed, mathematics, at this crucial grade in high school mathematics curriculum. The study also agrees with the contention that learners lose sight of their goals, become disinterested and are not actively involved in classroom learning of algebra (Du Plessis, 2020). These are crucial matters, and this present study posits that the meld of teacher-learner dynamics in terms of classroom interactions, learning environment, and the teacher’s use of teaching approach, as well as learner expectations can be either enabling or disabling of learners’ negative experiences of the topic.

4.1.4 Some of us are left behind school B

The reluctance the teachers tend to have in ensuring differentiation in their teaching is narrated by the learner participants. The narratives seem to suggest that not enough accommodation is made by the teacher for the varied and differential learner learning styles and their learning needs and levels of understanding of the topic in their lessons. Hence these participants’ perception of their teaching as focusing on some learners and not all learners in the class. The learners’ disappointment

with what they see as their teacher’s selective focus on certain learners is evident in the comments. Learner 1 (School, B) ... (the teacher) looks at bright learners and talks and interact with them only, some of us (other learners) are left behind as he talks to them and goes on. So, actually I feel lost and struggle to catch up but sometimes it’s hard...Learner 2 (School, B) Ehmm... for me I don’t give chances, I had seemed to develop my own method of studying which actually been helping me. In class, if you are not asked, I will keep solving along so long as I understand... just to tag along. The participants seem frustrated by the poor teacher-learner interactions. Their comments suggest that the teacher seems only to do teach a section of the class while ignoring others. Keiler (2018) highlight the importance of the classroom teacher teaching for a whole class and not focusing on just a section or certain learners in class. However, the teacher says: Teacher 1 (School, B) Teacher and learner centered approach works well for me. Simply because my learners are different, those who are smart learn better with learner centered approach whereas for slow learners, I use more of teacher centered. The above responses confirm the statement made by the learners. The teacher labelled some of his learners as slow learners or not being smart enough to be taught using a learner centered. In other words, he uses teacher centered to administer lessons for these learners he labelled as slow learners and this in turn has negatively impacted on the way they learn. This is also a serious matter because lack of teacher-interaction negatively impacts on the way the learners learn (Afshar, & Doosti, 2016). This

finding is consistence and in accordance with some recent literatures, such as (Murphy *et al.*, 2021) who argue that when classroom is teacher centered, learners work alone and tend to have less opportunity to work with one another (Muganga, & Ssenkusu, 2019). The finding of this study also reveals that some of the Grade 10 learners are not benefitting from their teacher, instead the teacher constrains their learning. Drawing from social constructivism theory, which indicates that human development and knowledge is socially constructed through interactions with others (Campbell *et al.*, 2018; McKinley, 2015). Thus, when the teacher refuses to neither interact nor support their learners, the learners learning becomes negatively affected (Cicekci, & Sadik, 2019). A similar view is taken by Willemse *et al.*, (2022) who suggest that teachers should provide their learners with all the necessary support for them to be competent and confident in their Grade 10 learning. But this was not the case in this study.

4.1.5 The Language

The findings in this study suggest that some participant's expressed challenges in understanding the language used by their mathematics teachers. This may explain why they have negative experiences of learning Algebra. In the line with discussion, the following views of learners were stated here related to language: Learner 10 (School, A) Ehmm.... one of the things I find challenging is the language used by our mathematics teacher. Most of the time, the lesson becomes very difficult to understand as the teacher does not use the language that we are familiar with. Other participants noted that the mathematics teacher

does not speak nor understand the local vernacular, isiZulu, a language well-spoken in the Kwa-Zulu Natal Province where the study is conducted led to their difficulty in understanding the topic. In line with the discussion, the following view of the learner is shared below: Learner 11 (School, A) The language was a little bit challenging, some of us feel shy to ask the teacher questions or seek for clarification of learning points in the language we are familiar with since the teacher doesn't speak or even understand the same language that we speak. Learner 9 (School, B) regarding my experience about learning the mathematical symbols and formulas in algebra was problematic. Eeish this teacher fails to interpret them further in the language I can understand better. Instead, he uses high words in mathematics I don't even understand well. The above responses show that the weak familiarity of language use by the mathematics teacher posed as a significant threat by the participating learners. These findings resonate well with the studies by (Owen-Smith, 2010; Saneka & de-Witt, 2019) that majority of learners in South African schools face a language barrier in their classrooms. For example, scholars like Janse van Rensburg (2016) found that learners in South African schools were afraid to answer questions requiring language skills due to the language barriers. Conversely, in another study by Bhengu (2015) on exploring the Grade 10 learners' responses towards the teachings of Isi-Zulu as first additional language. The finding also shows a massive positive response by these learners when taught by their native language. According to Tavoosy & Jelvey (2019) learners who cannot use

the language he or she can understand well, for example her home language in the classroom is disadvantaged and not likely to do well in class. This finding also supported the existing studies by (O'Neill, Russell 2019; Mehan, 2020) who indicated that some learners cannot ask question nor make suggestions in class when the home language cannot be used. This in turn has a negative impact in the way they learn. Drawing from the learners' questionnaire responses, these Grade 10 learners experienced challenges due to a language barrier that impacted on their experiences because, mathematical symbols and formulas are in themselves a language on their own, and for high school learners, interpreting them in language they understand cannot be anything short of effective teaching. Therefore, the learners' perception of their effective leanings experience is one that concretizes their learning by using terms, imageries, examples and illustrations in the language the best understands which is and makes the learning accessible to the learners.

4.1.6 Teacher's nonchalant attitude

The questionnaire responses from the learner participants from both schools also indicated that the teacher's attitude was another inhibiting factor that strongly impacted on their learning. These ranged from the teacher's lack of interaction and communication, poor teacher and learner interpersonal relationships etc. Furthermore, one of the participants in the interview session expressed concern about the teacher's nonchalant attitude and how they teach them gave rise to absenteeism. Learner 2 (School, A) *Our teacher does not like interacting with us learners even to catch up with*

some jokes with us during the class... when we have challenges understanding the algebra lessons, we are afraid to ask help from him because of the way he shouts, talks and treat us. Sometimes I do not attend his class. Learner 4 (School, A) Eiiish.... there was a day I asked our teacher if I could be seeing him whenever I need some help in algebra which he agreed, So I had only seen him twice for help since this term and many times I went to his office, he will either say I came late or I must see him the next day. The next day he shouted at me when I went to remind him. He has attitude and less concern about us. Additionally, other than the observed negative attitude by the learners, some of the participating learners from School B noted that on several occasions, their mathematics teachers were not always in school, thus affecting how much they covered in preparation for their examination. The following quote provided evidence of the views generated from the participant: From Learner 6 (School, B) *sometimes he will be out for a medical check at the clinic and do not return to school before school closes for the day. The above responses from the participants showed that the Grade 10 learners 'developed the attitude of not attending classes due to poor teacher and the learner's relationships.* As reported in Odike & Nnaekwe (2018) that the teachers' nonchalant attitude discourages learners, causes an unpleasant learning environment, and limits their course choices thus, negatively impact on them i.e. if the foundation for a good relationship of a teacher and a learner is lacking (Blazar & Kraft, 2017). As a result, the learners will resist rules and procedures

and will neither trust their teachers nor pay attention to what they are saying if they sense teachers do not respect them (Kirby, 2020). Additionally, the above findings corroborate with Lazarevic & Bentz (2021) who identified that the lack of teacher and learner interaction can lead to stress and when a learner experiences a high level of stress, regardless of her age or level of studies in class, this may interfere with her ability to learn. The above findings also resonate with Sabates *et al.*, (2021) who in their study identified that the lack of teacher and learner interactions could lead to a low learner attainment level and consequently results to a lack of respect from the same learner. Conversely, the study by Akhtar *et al.*, (2019) concurred that if there is no-interaction between a teacher and his learners, impacts on learners' mind may be impossible. In contrast to this study, plethora of studies (Alemu, & Woldetsadik, 2020; Chen *et al.*, 2021; Engels *et al.*, 2021; Syahabuddin *et al.*, 2020) have shown that a good relationship between a teacher and his or her learners can have a considerable impact on learners' academic success. Therefore, learners who have positive relationships with their teachers are less likely to avoid school (Rimm- Kaufman & Sandilos, 2011). Drawing from the findings, the study discovered that some Mathematics teachers always absent themselves from their class duty with the excuse of going to the clinic for a medical check-up sometimes and do not return to the school before it closes for the day. Therefore, these teachers' attitudes negatively impacted on the learners' learning experiences. This finding is in line with the recent literatures that when a teacher is absent

from the classrooms, learners' learning is disrupted and when that occurs repeatedly, learner's success in academics can be seriously impacted in a negative way (Wallace, 2020; Medrano, 2019). Consequently, Finlayson (2009) states that the more the teacher is away from school the lower the learners will score during classroom test. However, the findings in this study also agrees with Wallace (2020) and Medrano (2019) who in their studies argue that when a teacher could not be found in the classroom during working hours, learners learning are disrupted and when that happens often, learners learning may be affected.

4.1.7 Lack Knowledge

Another theme emerging from the participants' responses was the lack of teacher's content knowledge. The comments from these learners indicated that the manner in which they are 68 taught algebras at the Grade 10 levels did not guarantee much in quality as this has greatly affected their learning. The following comments were made by the participants. Learner 1 (School, B) '*Ehmm, one of the things I noticed about our class teacher is that during class lessons, he focuses more on the worked examples from the mathematics textbooks. And when we ask why he always focus on the worked examples, he would say it's part of our class work. Eiiish... this thing is a problem and this has made some of us to begin to lose interest in learning mathematics. Another participant pointed out that in certain instances their mathematics teacher will get stuck while solving question on the board and he will ask the learners to find the solution to the problem. As a result, some of the learners do not want to be*

attending mathematics class. As expressed by the following participants: Learner 3 (School, B) There used to be time when our Mathematics teacher will get stuck with a question, he will then say guys attempt this question. Sometimes we encounter additional obstacles as we attempt to solve the question and because of this some of us do not want to be attending our Mathematics lesson. Another of the participant indicated: Learner 4 (School, B) Most times our teacher cannot comfortably solve questions freely on the board without having to carry his Mathematics textbook and look at previous examples. And this has made me to have the feeling he isn't good with the subject content. Hence, some of the participants advised that a professional teacher ought to be creative by the use of diagrams or pictures in order for their learners to have a better understanding of the concept. In line with the discussion, the following quote of the learners below serves as evidence of the raised view: Learner 11 (School, B) An experienced teacher has to create conditions that will encourage us and help us to understand the algebraic concept, by the use of diagrams or show some pictures while teaching some of the algebra concepts. But in our own case, our mathematics teacher could hardly do the same. Therefore, the findings from the above verbatim statements from the participants showed that the Grade 10 learners had diverse negative learning experiences. For instance, Learner 11 (school B) noted that her experience made her to lose interest in attending mathematics lessons as the teacher always focuses more on the worked examples on the textbooks. In a similar vein, Learner3 (school

A) also asserted that their mathematics teacher sometimes gets stuck while solving questions on the board and what he does is to ask them(learners) to find the solution. Meanwhile, this finding from this study corroborates with the study by Panthi & Belbase (2017) who discovered that when teachers do not get to the roots of the mathematical equation, learners experience difficulty in problem solving and fall behind academically. Thus, making these learners who are about completing their high school education to lose confident in mathematics related skills and subsequently avoid careers that would relate to those content areas (Mazana *et al.*, Mutegi *et al.*,2021). Learner 4 (School, B) also noted that the lack of teacher's knowledge therefore explains why sometimes her teacher could not solve difficult questions without having to look at some previous examples on the mathematics textbook. This finding therefore suggests that the lack of content knowledge of some high school mathematics teachers may limit the impact of other educational inputs, such as using textbooks effectively (Hatisaru, 2020). Therefore, improving the knowledge of teachers would be more important rather than investing in physical resources (Granziera *et al.*,2021). In addition, the findings in this study also revealed that the lack of teacher's knowledge created a lot of challenges for the learners. This is because the data showed that some of the mathematics teachers could not make use of the maps or show some diagrams to explain the algebraic concepts to the learners so they could grasp or understand the content better (Melhuish, Eiiish 2020; Sholihah, & Maryono, 2020). Similarly, a recent study by

Hatisaru, (2020) also points out that there are some mathematics teachers who only solve correctly but neither use pictures nor diagrams to represent the algebraic concepts and procedures for a better understanding. Significantly, the findings suggest that the lack of teacher quality might explain why the use of resources to teach algebra has proven to be so little effective in enhancing the learners learning (Rusilowati, & Wahyudi, 2020). Therefore, a closer examination of the findings in this theme have shown that there were many inhibiting factors that these Grade 10 learners experienced while learning algebra in the classroom and that if nothing is done faster, it will likely hinder their learning of algebra. However, evidence of the above claims is relevant to social-constructivism theory (Vygotsky, 1978), where Vygotsky posits that individual understanding improves by the virtue of social interaction (Vygotsky, 1978 & Hart *et al.*, 2020). This is what the social constructivism theory reveals that the interaction between a teacher and learner indirectly affects a learner's learning which can act as a powerful influence (negatively or positively). In this regards, non-interactions between a teacher and her learners can lead to their negative experiences (Doyumgac *et al.*, 2021). Hence, the participants in this study were able to identify factors in their school which according to them were seen as negative experiences as shown in the above discussion. However, not all factors contributed to learners' negative experiences, but there were also other factors that were noted by the participants as positive Experiences.

4.2 The Learners 'Positive Experiences'

4.2.1 Algebra is enjoyable

Data from the participants (learners) responses in the questionnaire indicated that they enjoyed learning algebra because it makes them to think of how to solve an algebraic equation without the use of mathematical calculator. They further revealed in the questionnaire responses that the study of algebra enabled them better understanding even in other branches of mathematics. It was noted by Learner 1 (School A) in the questionnaire that he enjoys algebra a lot because it makes them to solve a question directly without having to use a mathematical calculator. He also pointed out that this topic has assisted him to have a basic knowledge not only in algebra but in other areas of mathematics. Furthermore, learner 2 (School, A) in the questionnaire also disclose that the Grade 10 algebra lessons has helped a lot in developing her mathematical thinking which in turn enabled her better understanding in other branches of mathematics, for example trigonometry and calculus etc. Other participant, learner 6 (School, A) in the interview session noted that the experience he had in learning the Grade 10 algebra assisted him to develop competency in learning mathematics in general. The story of these participants is shown in the following quote below. Learner 1 (School A): "It is an enjoyable topic because it makes us to use our mind most of the time and not using a mathematical calculator". It's actually helping me to believe I can do it myself and to have an understanding that without a solid foundation in algebra, understanding other branches of mathematics will be difficult for me. Another participant supported: Learner 2 (School,

A) I enjoyed learning and attending the algebra lessons because it develops our mind to understand other areas of mathematics such as trigonometry, calculus. In fact, it's actually preparing me for more difficult problems in mathematics of which I will be doing in the university. Learner 6 (School, A) To me I have realized that the challenge I had during my GET level was due to the poor knowledge of algebra in mathematics. Initially, I didn't take my studies in mathematics very serious and always had this mind that mathematics can be studied like every other subject until I realized that for you to be good in mathematics in general, one must have a good knowledge of algebra. So, a lot of things are beginning to change in my life and I'm so happy since I could solve the simple problems in Mathematics. From the above data, it is apparent that these learners enjoyed learning the Grade 10 algebra. Their responses also have shown that mastering algebra helped them to develop conceptual understanding not only in algebra but in other branches of mathematics. These findings resonate with the studies of Star, Caronongan, Foegen, Furgeson, Keating, Larson, Lyskawa, McCallum, Porath & Zbiek (2015) that understanding of algebra is a key success to future mathematics and in other areas of mathematics. Although, plethora of studies emphasized that elements of algebra are found in other branches of mathematics such as trigonometry and geometry (Makonye and Stepwell 2016; Mhakure, Jacobs & Julie, 2014). Therefore, drawing from the above findings suggests that mastering the Grade 10 algebra is a gateway to understanding other branches of mathematics.

4.2.2 Algebra is Fun

The responses from the participants' both in the interview sessions and in the questionnaires show that the Grade 10 algebra was fun. For example, the participants mentioned that the algebra was fun as numbers and signs are used to represent words and vice versa. In particular, learner 2 (School B) noted that the Grade 10 algebra is fun as numbers are used to represent words in an algebraic equation. He further indicated that without the knowledge he had in learning the Grade 10 algebra, he wouldn't have noticed numbers, signs and symbols could be used to represent words. In relation to algebra is fun, learner 4 (School, A) commented that he finds the Grade 10 algebra as fun as he plays with some numbers and mathematical symbols which enabled his understanding on how to solve equations without difficulties. The participant's verbatim quotes are presented as follows: Learner 2 (School, B) I have learnt a lot about algebra, like how to represent numbers and signs of an algebraic equation into words. So, using numbers and signs to represent words in algebra is something that I have never known before but now it's more like a fun to me. Another participant indicated: Learner 4 (School, A) Learning algebra was quite fun because, for example playing with numbers and some mathematical symbols helped me to solve questions more easily. However, the participants' responses above show that the Grade 10 learners developed diverse academic skills such as representing numbers, signs and symbols of algebraic equations into words and also improved on problems solving. The above findings are

consistent with the study of Guhl (2019) who indicated that a learner develops diverse academic skills through learning algebra.

4.2.3 Algebra is Exciting

From the participant's responses, it was evident that the learners were finding the Grade 10 algebra very exciting. In particular, the participants spoke about their lesson being exciting because it is connected to what they already know. The following comments were made by the learner participants. Learner 7 (school, A) the algebra lesson was exciting because some of the things we are learning in class are what we already know. Learner 11 (school, A) As for me I find the lesson very exciting because it's linking with most of the things, I learnt during my Grade 9. Learner 10 (school, A) Yes', I do find the Grade 10 Algebra lesson exciting because our teacher uses examples that connect to what we know before. The above responses show that some of the participants found the lesson very exciting. They mentioned that their mathematics teachers are using examples that connect to what they have been taught before. While we know that learners find their lessons exciting is because it is connected to what they already know to make the lesson come alive (Cheung, 2018). When the lesson comes alive, the learners will not dose off nor disengage (Willis, 2021; Burgoyne, & Cohn, 2020) rather they will become contributors (Hargreaves, & O'Connor, 2018). When the lesson comes alive, the learners become active and participate fully in the class teaching and learning (Bovill, 2020).

4.2.4 Enhance our Thinking

When talking about their experiences of learning algebra, the participants also comment that learning the Grade 10 algebra enhanced their ability to think deeply in order to solve problems. These include the ability to think of the appropriate procedures to solve algebra. The utterances of some of the participants say this clearly: Learner 2 (School, A) I wish our teacher would be teaching the Grade 10 algebra on daily basis because learning this topic has developed my thinking ability. I could remember what I used to do during my Grade 8 and Grade 9 when I am given a question to solve. I would start solving without having to think of the appropriate method to use. Additionally, some of the participants mentioned that from their experiences such as learning the Grade 10 algebra enhanced their thinking. The participants below provided a candid comment that sums this up as follows: Learner 2 (School, B) To me the positive aspect I found about learning algebra is because, it's always making me to think and remember how our teacher usually solves it, some of the things he says while solving problems in algebra. It has actually helped to develop my thinking ability and I'm able to think clearly whenever I am solving algebra. Learner 3 (School, B) I have learnt a lot while learning algebra. You can't solve algebra without having to think of the right method to use. I could remember what our mathematics teacher usually tells us. One thing is to pay attention during classes and that it would help you to remember some of the things that took place in the classroom. For example, the methods he used and some kinds of questions he always asking before finding the answer. So, this topic

actually helped to develop this skill and to believe that the solution of this thing is in thinking. The above responses confirmed the argument made by other studies. For instance, plethora of studies have supported the idea that learners who are critical thinkers are able to reflect on their own understanding and knowledge about the information that has been presented to them or explain procedures or concepts clearly (Syukriani, Juniati-Awoala, 2017). Similarly, Simamora & Saragih (2019) indicated that learners who have acquired critical thinking ability are able to make good decision in order to solve problem. Therefore, the findings of this study have clearly shown that the Grade 10 learners developed the skill of thinking which positively impacted on their learning.

4.2.5 Using different method

All participants' responses suggest that they were able to improve in using different methods to solve algebra. Ability to solve questions using different approaches were terms repeatedly mentioned by the participants as examples illustrates below. Learner 9 (School, B) Hmmm....., I am good at mathematics especially in algebra is because I took my studies serious. I could remember a number of times I picked up a mathematics question to solve and couldn't get the answer. I keep trying until I get used to solving algebra using different methods. So, at some point I became use to using different methods to solve questions in Algebra. Learner 7 (School, B) to me, I like challenges especially algebra. This topic has really taught me a lesson and I have come to realize that certain questions could be solved correctly using different

methods. And now I am able to solve equations using different methods and get the right answer. Learner 11 (School, A) from my own experiences, algebra is not like every other subject that you just read to understand the contents. Rather, is a topic in mathematics you basically need to practice (solve) from time to time and once you are doing that, you will definitely learn how to approach it using different methods to find the solution. The findings show that the participants experienced improved self-confidence in learning the Grade 10 algebra. This was evident in their responses of becoming an independent problem solver in mathematics, having to solve algebraic questions using different methods, feeling competent as mathematics professionals. This finding resonates with the studies of Angraini *et al.*, (2020) who reported that algebra enhances problem solving ability where learners gain more confidence and becomes independent problem solvers. In the light of the above-mentioned theme, literatures suggest that learners build new knowledge by creating mathematical ideas through problem solving (Mata-Pereira & da-Ponte, 2017). Thus, the findings from the study showed that the participants developed self-confidence as they work hard to attain proficiency in solving the algebra their teachers taught them.

5. Conclusion

From the findings in this study, the Grade 10 mathematics teachers in this study did not use a variety of teaching strategies in teaching their learners algebra. However, it is noticeable from the findings that the onset of the COVID-19 pandemic and subsequent impact on the teaching and

learning in schools influenced the teachers' choice and use of teaching strategy. This is a possible explanation to the teachers' responses to their use of strategy that emphasizes what they explained as "teacher-centered and a learner centered approach". The teachers' concerns about being able to complete their scheduled learning content in the specified period as well as the loss of classes by the Grade 10 learners, many of which were unable to attend classes normally meant that the teachers attempted to re-strategize their teaching approaches, leaving little or no room for variations. The second issue of note is when another teacher mentioned that she normally uses teacher centered approaches so that all learners would participate in the class. However, the teacher seems unaware of the dynamics of this approach and the disconnect it creates while the learners are lost and experience difficulties following the lessons. Perhaps, differing from her objectives, not only did the class teacher made use of the appropriate teacher's guide closely with respect to teaching approaches, but should have use the approaches where the Grade 10 learners would need to think for themselves. Findings in this study suggest that the learners had both negative and positive experiences while learning the Grade 10 algebra. This shows that the Grade 10 learners had a realistic view concerning the way they are learning. The findings however, identified some factors inhibiting their learning as discussed below. One which revealed the Grade 10 learners experienced their teachers' teaching of algebra as boring given the combination of the situations (a) where they are unable to understand some concepts (b) their teachers hardly explain in a

way they can understand (c) they find the lesson un-engaging because they are not allowed to ask questions (d) their teachers do not encourage conversation to clarify learning. As such, the above findings suggest the teachers' strategy was experienced as difficult because they could not understand. The learners were unable to follow the lesson and could not easily apply the learning to solve problems on their own. There have become other issues in this study that makes the learning difficult, for example, learners' perceptions of their teachers' care and competence posing the barrier in communication some of the learners felt between them and their mathematics teachers that impacted the quality of classroom experiences of learning algebra, challenges in understanding their teacher's explanation of concepts in English (meaning that another added barrier to their difficulties with learning algebra is weak familiarity with its mathematical concepts), poor teacher and their learners' interactions, teacher absenteeism from classroom duty. When learners are faced with such challenges, they can cause a high level of stress and therefore their participation, engagement and interest in the classroom activities also becomes affected. Regardless, the findings from this study have also shown positive learning experiences of some of the Grade 10 learners learning algebra which helped in developing and shaping their mind academically. The finding shows that some of the Grade 10 learners were resilient to the challenges they identified within the classroom, and therefore had developed and adapting strategies of becoming independent problem solvers. For example, some of the Grade 10 learners mentioned algebra as a

vital resource to their knowledge in understanding mathematics as learning the Grade 10 algebra has helped them to grow academically.

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