Article

Grade 9 Learners' Perceptions of the Influence of Peer Relationships on Their Mathematics Performance in Tshwane Municipality Secondary Schools

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Abstract

The study explored the grade 9 learners' perceptions of the influence of peer relationships on their mathematics performance in Tshwane municipality secondary schools, South Africa. The study engaged a mixed method approach and applied a descriptive survey design. The sample consisted of 400 learners (280 females and 120 males). A self-fashioned questionnaire was used for data collection, as well as a few open ended questions. The learners' termly result in mathematics was also used to ascertain their level of achievement. Quantitative data were analysed using the Pearson product moment correlation, while qualitative data were analysed in a narrative form. One null hypothesis was tested for the study and it was rejected. The study disclosed that grade 9 learners' perceptions of peer relationships was not a statistically significant factor influencing their mathematics performance. The study concluded that peer relationships were poorly appraised, hence could not have influenced grade 9 learners' mathematics performance. The study recommends that teachers and stakeholders in schools should consider the advocacy of positive peer relationships among learners to help foster acceptability among learners. Furthermore, advocacy for cooperative and interactive learning is recommended to enable learners to learn from each other effectively; this will foster peer mentoring.

Keywords: academic performance; learners; mathematics; peer relationship; perceptions

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Introduction

The global world has come to the realisation of mathematics education and its essence to society. This makes mathematics a major asset needed for global competition, especially in the world of technology (Kaiser 2020; Odeyemi-Bsd and Chireshe 2021).

Nations have placed a high premium on mathematics for many reasons, based on their organisational values (Odeyemi-Bsd 2020; Odeyemi-Bsd and Chireshe 2021). Among such nations are the United States of America (Wright and Ellis 2019), the European nations (Budinski and Milinkovic 2017; DeJarnette and Gonzales 2016; Sawatzki and Sullivan 2018) and South Africa (Naidoo and Ranchod 2018). This is an indication that the well-being of this present world is anchored on the success of young people in mathematics. Mathematics is a tool necessary for higher education, skilled personnel in workplaces and a developed economy.

The underachievement level among learners in mathematics is problematic to any nation (Arends, Winnaar, and Mosimege 2017; OECD 2018). The mathematics performance of Maldivian Asian learners as revealed from studies and national assessments was discouraging, and has not changed subsequently (Ministry of Education 2019). In a similar vein, these unfavourable results have also been experienced among learners in the United States. The outcome of the Programme for International Student Assessment (PISA) showed that these learners have consecutively performed below the required benchmark (Hanushek and Woessmann 2009; OECD 2020). The 2019 Trends in International Maths and Science Study (TIMSS) also produced an unimpressive result (Mullis and Martins 2019). Unfortunately, the US learners were among the most poorly ranked learners globally in mathematics. The European learners have also not found a place in the world of mathematical competences (Lithner 2011). The failure rate in mathematics among Swedish university students was also lamentable in areas where mathematics was required, owing to one difficulty or the other (Lithner 2011).

The Southern African region has also recorded massive failures in their mathematics performances. Namibian learners are among those who have consistently experienced failure (Mateya, Utete, and Ilukena 2016). In the South African universal Annual National Assessment (ANA) of 2014, numeracy skills outcome of learners in grades 1–9 showed that their mathematics scores were poor at their respective grades; grades 1–3 had a fair result, but grades 4–9 had a poor result according to the Human Sciences Research Council (HSRC) as reported by the Department of Basic Education (2014). Grade 9 learners' result has predominantly remained at the lowest ebb in South African education (Department of Basic Education 2014). The 2018 (PISA) also revealed a disappointing result; South African learners were rated the poorest in the assessment among 80 countries (OECD 2018). Similar results were also recorded in the World Economic Forum's 2018 review, where South African learners reported only a 2.6% measure of success and were positioned 128th out of 137 countries (World Economic Forum 2018). Furthermore, the TIMSS assessments have continuously recorded unwholesome results regarding the majority of South African secondary school learners

(Mullis and Martins 2012). The performances of South African learners have become a significant concern for several educational stakeholders, and the causes of the failures must be unravelled (Odeyemi-Bsd and Chireshe 2021) because success in mathematics for South Africans is a key to attaining technological success (Jojo 2019; Odeyemi-Bsd 2020). School learners in South Africa are encouraged to undergo mathematics or mathematics literacy for them to be properly furnished for work and life activities in an ever-increasingly scientifically driven global economy.

Having shown above the necessity for mathematical skills in the global world, learners are still demonstrating repeated failure in mathematics as a subject (Arends, Winnaar, and Mosimege 2017; Feza-Piyose 2012; OECD 2018). It is possible that the poor performance of learners in mathematics in South Africa is a strong signal that can possibly impede the realisation of the South African vision for the 2030 Sustainable Development Goals (SDG). The Department of Basic Education (2014) reported that grade 9 learners recorded a 22% level of achievement in mathematics, with a slight improvement to 45% in the following year. The 2017 TIMSS review also disclosed that South African grade 9 learners outperformed just one of the 39 countries, leaving South Africa near the bottom position of 38th out of 39 countries. This indicates a 13% score, and 87% level of non-performance in mathematics (Reddy et al. 2017).

The functionality of quality mathematics education as an impetus for national growth has also been attained by numerous nations across the globe (Hoeg and Bencze 2017). Therefore, the development of mathematics education is a top notch agenda for the educational policy drafting agencies around the world. Mathematics is a subject of human endeavour where scientific techniques of observation, representation, finding out formats or activities, and measurable connections feasible in physical and social happenings between mathematical aims or items are employed (Odeyemi-Bsd and Chireshe 2021). Mathematics is also an indispensable and essential machinery for the making of the learned person (Odeyemi-Bsd 2020). Mathematics has also been found to be the device needed for the sharpening and equipping of human reasoning and the human psyche; it reconditions the human brain's ability and develops its dispositions (Chowdhury 2016; Odeyemi-Bsd and Chireshe 2021).

Successes in mathematics helps predict a successful career (Wang and Degol 2017). Learners' thoroughness in mathematical skills assists in fostering advanced positioning or placement with more career options (Wang and Degol 2017). The discrepancies in the mathematical performances of learners has spurred a lot of awareness from curriculum planners and stakeholders of the need to use varied methodologies of teaching and learning. This differentiation is not far from the manner of successes and failures of learners. These discrepancies were concluded to be connected to some factors which may likely include self-esteem, motivational situations, psychological issues, study habits, self-concept, and poor interpersonal interactions among learners (Wang and Degol 2017). Some factors were also raised to have possibly been traced to internal and external elements affecting learners' performance. These elements may become an

impediment in a society where the priorities of learners' successes are underplayed by the stakeholders and the learners with their inappropriate attitude towards attaining a successful benchmark (Acharya 2017; Ugwuanyi, Okeke, and Asomugha 2020).

Some facts about South African mathematics were broken down in the Department of Basic Education's report over the generally shameful performance, stating its topmost agenda as improving the quality of outcomes emanating from the educational system (Department of Basic Education 2014). Hence, the South African learners' mathematics failure becomes a crucial matter to be resolved within a limited time frame (Hajovsky et al. 2020).

The poor performances frequently documented in mathematics makes it necessary to investigate the factors that influence Tshwane municipality grade 9 learners in their mathematics performance. Additionally, Tshwane grade 9 learners were not really covered in several studies done on mathematics performance, hence the need for considering grade 9 learners in this study. This study was also prompted based on the critical transitional educational stage of grade 9 learners, after which subject choices are made (Department of Basic Education 2014).

Problem Statement

The background to this study has shown the indispensability of mathematics as a subject in South Africa and across global educational systems, but learners' comprehension is unfulfilling (Naidoo and Ranchod 2018; Odeyemi-Bsd 2022; Yenmez et al. 2017). A large population of school learners in South Africa are far behind the world standard in attaining the required proficiency level in mathematics (Odeyemi-Bsd 2020; Reddy et al. 2016). As stated in the background to the study, some studies (Feza-Pisoye 2012; Tachie and Chireshe 2013) have been done on the possible factors influencing learners' academic performance in mathematics. But these studies focused on other provinces of South Africa, and Tshwane municipality grade 9 learners were not included. The present study aimed to discover the perceived factors that may be influencing grade 9 learners' mathematics performances in Tshwane. The objectives of the study are:

(1) To establish the perceptions of grade 9 learners on the relationship between peer interaction and their performance in mathematics in the Tshwane municipality.

(2) To determine the perceived strategies for improving the grade 9 learners' academic performance in mathematics in the Tshwane municipality.

These objectives will help learners to build positive peer relationships to enhance their academic success.

Sub-Research Question

What is the extent of grade 9 learners' perception of the influence of peer relationships on their academic performance in mathematics in the Tshwane municipality?

Hypothesis

The study quantitatively tested the following hypothesis at $p < .05$:

$H_0$1. There is no statistically significant relationship between grade 9 learners' perceptions of peer interaction and their academic performance in mathematics in the Tshwane municipality.

Theoretical Framework

The study's theoretical framework is anchored on the social cognitive theory of learning (SCT). The SCT of learning is concerned with the interplay of the environment, where self-observation and self-evaluation (beliefs and perceptions), role models, and self-efficacy are crucial to learning. Furthermore, the theory considers the ability to self-organise, be proactive, self-reflect, and self-regulate among individuals. These are all indicators that learners' performances are related to these interrelated concepts. Peer interaction is a factor that is commonly viewed as affecting learners within a given academic environment. The theoretical framework is discussed under three different but interrelated components of the SCT, namely self-observation and self-evaluation, modelling, and self-efficacy (Redmond 2010). The SCT suggests that it is practically impossible for learners not to be able to learn from each other since these learning experiences are achieved through observation and modelling among peers.

Self-observation and self-evaluation gives room to a critical study of oneself in line with personal academic progress, especially when compared with peers. Self-observation and self-evaluation is a motivating channel to assess the extent of expectation of outcomes, and this must be done from time to time; observed behaviour must be consistent, especially when the behaviour occurs (Zimmerman 2001). The results of the self-observation and self-evaluation provide learners with the zeal of influence, so that they take responsibility for their own actions in order to attain specific results. We have the processes of personal agency, which initiates a measure of control in individuals' personal ideas and actions which comes as a result of processes of personal agency. Human agency takes three forms, namely independent agency, mechanically reactive agency, and emergent interactive agency (Bandura 1986). The SCT posits that learners are agentic actors of their personal encounters. This implies that the grade 9 learners of Tshwane make positive decisions based on their interactions with peers. These learners possess abilities to feel and perceive experiences even when going through them (Odeyemi-Bsd 2020). Human brain development and activities are functions of the human agentic action (Kolb and Whishaw 1998). Agentic action makes it possible for learners to explore and make choices of peers who are capable of influencing their performances positively. Furthermore, the acceptability of peers and interactions have

become noted as some of the reasons supporting academic successes among learners (Odeyemi-Bsd 2020). The SCT clearly points out that these peers are mentors in their own ways to their fellow learners; peer mentorship may either make or mar learners academically. The SCT understands the involvement of many factors, including parents, peers, teachers, and other stakeholders in the promotion of learners' performance.

Modelling also makes it possible for learners' choices of positive models who are capable of modelling positive academic attitudes or behaviour into learners. Modelling refers to a cognitive behavioural pattern whereby learners learn by imitation from observable behaviours displayed by the model. It also involves learning by copying the behaviour of others referred to as models. Modelling plays a key role in promoting better academic performance among learners. Peers' interactive methods in the SCT are also perceived as a robust mechanism for effective learning, especially where peers enjoy acceptance among their friends, and where positive academic modelling subsists (Zimmerman 2003).

Self-efficacy can be explained as a strong positive persuasion of confidence and capability in oneself. Self-regulated learners can differentiate between inherent skills possessed and learnt (Zimmerman 2008). Self-regulated learners can identify the academic task needed to improve performance on their own, and they are able to set goals for effective studies to achieving the task (Hadwin et al. 2001). A self-regulated learner has the chance of better academic performance owing to their personal academic desire and adaptive learning methods (Zimmerman 2008).

Self-efficacy and self-regulation have a major role to play in bringing to the fore the needed academic excellence in learners. It has also been proven that the interactive activities of peers in the SCT are also a catalyst for effective learning, mostly where acceptance, self-efficacy, and academic modelling is regarded (Zimmerman 2003). There are several principles presented in this theory which are pivotal to explaining factors perceived by grade 9 learners to be influencing their performances in mathematics in Tshwane.

Positive peer interaction was perceived as a necessity for promoting learners' academic performance, especially when learners are of a similar age grade (Odeyemi-Bsd 2020). Studies in the United States showed that learners' peer interaction was a notable factor for academic performance (Kirk 2014; Rambaran et al. 2017). Some surveys in the United States that followed the SCT of learning affirmed that peer interactions are synergies to academic performance among learners. These studies revealed that American learners manifest a measure of ego development, with desirable behaviour leading to positive academic performance upon warm reception from peers (Llorca, Richaud, and Malonda 2017). Behavioural constituents of school performance in America shows that positive peer interaction was perceived to exert positive effects on learners' academic performance (Wang and Eccles 2012; Wentzel 2017).

Peer rejection among learners can be destructive to an individual's self-esteem, and hence truncate academic performance. American learners who go through peer rejection are often exposed to a high degree of anxiety and become worried about the fear of rejection and teasing, which invariably jeopardises their classroom concentration (Sentse, Prinzie, and Salmivalli 2017). In a similar way, peer rejection among learners may result in future unhealthy social and academic dispositions; most often, this is an indication of a high level of failure and pull outs from schools (Rubin, Bukowski, and Parker 2006; Wentzel 2017). Peer victimisation, which leads to rejection has been perceived in schools as a strong signal of academic woes among American learners.

Zimmerman's (2003) survey on peer influence on roommates' ability in verbal activity in Europe concerning their academic outcomes with the use of the Students' Achievement Test (SAT) showed a positive influence. The survey revealed that roommates with a total score of 15% on the SAT had an inverse correlation for learners, while learners with roommates with 70% SAT scores had a positive correlation with the learners. This indicated that positive peer interaction was perceived to have a strong influence on learners' academic performance. Sacerdote (2001) also disclosed that pairing roommates in academic exercises promotes better performances based on positive peer relationships. This is also an indication that when high performing learners are matched with low or average performing learners, there may be a surge of positive performances among the low or middle learners.

When peers comprehend each other through positive interactions, they often facilitate autonomy for themselves on their performances academically (Ruzek et al. 2016). The studies of the European learners on peer relationship was in agreement with the SCT directing this study. The theory emphasises that peer interactive activities are viable apparatuses for implicit learning among peers who are well received by others (Zimmerman 2003). Hence, a strong relationship was established between peer relationship and learners' academic performance.

Similarly, Kadir, Atmowardoyo, and Salija (2018) reiterate that peer interaction has a way of influencing and boosting learners' anxiety regarding their academic activities within their schools and homes in Asia. A strong relationship exists among these peers, leading to correlational influences.

In the Nigerian context, studies have indicated the impact of positive peer relationships on performance; it was also noted that negative peer relationships have always signalled woes for learners (Olalekan 2016a; Temitope and Ogunsakin 2015). Nigerian learners exposed to positive peer support excel and apply more diligence to studies for improved academic performance (Olalekan 2016b). It was further elucidated that a major key to experiencing an excellent peer interaction and a highly practical interaction for learning is working with friendly and supportive peers in Nigeria (Filade et al. 2019). When learners are adequately monitored in the choice of peers, it is perceived as a stronghold

of positive outcomes on their academic performance among Nigerian learners (Odeyemi-Bsd 2020).

Duflo, Dupas, and Kremer (2009) conducted an experimental study on peer pairing and performance in Kenyan schools. This took place in a tracking and non-tracking schools. In tracking schools, learners are divided into classes based on their academic performance, while in a non-tracking school, all the learners are brought together regardless of their performance level. The results over time showed a strong correlation when learners were randomly paired with academically better students in the tracking schools than learners from the non-tracking schools. The comparison in the results unveiled a positive direct input in peer qualities, and an indirect input owing to teachers' behaviour. A study with a group of South African learners suggested that peers have a premium opportunity of persuasion on any member of their group. Although these decisions may not align with each member's wishes, he or she is obliged to take instructions for compliance owing to the strong influence of peer group interactions on peer members (Brown and Klute 2003). The chances of doing this is anchored on the strong network of interactions existing among the learners, whereby they easily prevail on each other; this also has a strong influence on their academic performance. Brown and Klute (2003) further showed that there was a strong bond of interaction and connectedness among some South African peers, which is capable of a strong academic push in their performance, especially in mathematics.

Learners who strive for better school performance are often attached to peers who are willing to show and share academic experience with them, rather than with peers lacking academic interest and activities (Odeyemi-Bsd 2020). Positive role models among peers are perceived as strong support for improved academic motivation and progress among South African peers (Buhs, Ladd, and Herald 2006; Odeyemi-Bsd 2020). The studies presented above prove the applicability of the SCT which informed this study. The SCT posits that behaviour modelling is a useful concept for influencing learners' academic achievement.

Despite the strength of peer relationships on academic performance, peer relationships have also been perceived by some studies as not having any positive effect on learners' academic performances. Some of these studies include Roiki (2019), in Europe; Ryan (2015), Kirk (2014), and Angrist (2014), in America; Mosha (2017) in Tanzania, and Bosman and Schulze (2018) in South Africa. The finding of these studies revealed that peer relationships was not a strong index for learners' poor academic performance; in addition, it was unveiled that most younger learners have the habit of discussing their scores with friends, while older learners who fall within this study refrain from such discussions about their grades with friends, while a few studies perceived that learners at this level have a way of handling their academic activities without involving peers (Roiki 2019). Most peers have also formed a habit of motivating themselves academically with independent learning and studying styles (Bosman and Schulze

2018). The present study focused on the perceptions of how peer interaction influences grade 9 learners' academic performance in mathematics in South Africa.

Methodology

This study was done within the parameters of a post positivism paradigm which dwells on thoughts of objective reality (Creswell 2008). The study sample consisted of 400 grade 9 learners who were selected using a random sampling technique from the sum population of 143 175 grade 9 learners in the Tshwane municipality (Cooper and Schindler 2014). Ten clusters were identified, with the systematic selection of 400 learners. In the selection, sex and classes were considered. The study was also descriptive in nature and applied a mixed method approach, using a few open-ended items in the researcher-made questionnaire. The five-item Questionnaire on Student Academic Performance (QSAP) was used to elicit data from the participants, and the questionnaire was sectioned into two parts. Section A was for participants' demographic information, while section B was meant for eliciting information from the participants on their perceptions regarding the factors influencing their mathematics performance. The learners' term result in mathematics were also used in place of an achievement test to ascertain their performances alongside the questionnaire.

The responses followed a four-point Likert scale, ranging from strongly agree, agree, disagree, and strongly disagree, scored 4, 3, 2, and 1 according to each item in terms of scoring positive items, and a reversal of direction in scoring negative items. The validity of the study instrument was achieved with judgement from four experts in the field of psychology of education, and measurement and evaluation; the reliability was also ascertained through a pilot test at schools in different locations from the schools in the study. With the application of the test-retest method, the reliability was empirically arrived at, using intervals of four weeks, which gave a coefficient value of 0.65. The items were rated by calculating the frequency table and ratios. The correlation of the variable on mathematics performances of learners was determined using a chi-square test.

The study instrument was personally administered by the researcher. The items with closed questions were analysed quantitatively using SPSS (24th edition), while the trustworthiness, credibility, dependability, and transferability of the qualitative data were ascertained, and the open-ended questions on strategies perceived for improving learners' performance were analysed in narrative form. The open-ended items required a brief statement while a closed-ended item only required a choice of Agree, Strongly Agree, Disagree, or Strongly Disagree. The mixed method approach shows objectivity in description and interpretation and relates with the learners' perceptions and meanings in a natural setting. Although it can be cumbersome to capture the perceptions of many respondents within a short frame of time, the method facilitates an in-depth study, allowing for a very robust result (Patten and Newhart 2018). Ethical issues were also considered in the study, and approval was given by the University of South Africa Ethics Committee.

Results

Hypothesis Analysis

A null hypothesis was formulated for this study, and had to undergo statistical testing in order for it to be accepted or rejected. T-test statistics were applied in testing the hypothesis, and a significance level of 0.05 was set.

Hypothesis 1: There is no statistically significant relationship between grade 9 learners' perceptions of peer relationships and their academic performance in mathematics in the Tshwane municipality.

Data Analysis

Table 1: The peer relationships and academic performance of grade 9 learners in mathematics in Tshwane Municipality (n = 400)

Variable	Mean	SD	n	df	r-cal	r-crit	Sig. Level
Peer relationship	14.62	3.17	400	398	0.01	0.20	0.05
Performance	54.96	13.51					

Not significant

Significance

Table 1 shows a calculated r-value of 0.01 for the correlation between peer relationships and mathematics performances of Tshwane Municipality grade 9 learners. The calculated r-value is not statistically significant because it is less than the critical r-value of 0.20, taking into account 398 degrees of freedom at 0.05 significance level. This implies that there is no statistically significant correlation linking peer relationships and Tshwane municipality grade 9 learners' mathematics performance.

Discussion of Findings

Perceptions of Tshwane grade 9 Learners' Perceptions of Peer Relationship and Mathematics Performance

The study examined Tshwane grade 9 learners' perceptions of peer relationships and mathematics performance. This section treats the sub-research question, which reads thus: What is the extent of Tshwane municipality grade 9 learners' perception of the influence of peer relationships on their mathematics performances?

The findings showed that grade 9 learners in the Tshwane municipality perceived an insignificant correlation between peer relationships and their mathematics performances. Grade 9 learners negatively evaluated their position on peer relationships and their mathematics performances. In addition, the study showed that Tshwane grade

9 learners did not perceive that their mathematics performance was influenced by peer relationships. The study findings show that Tshwane grade 9 learners' perceptions about their performance was in no way linked to peer interaction. This may be linked to the fact that grade 9 learners have not perceived peers as catalysts influencing their studies. It was also revealed that the grade 9 learners had the perception of handling their mathematical tasks without their peers. These findings on peer relationships are in accord with studies in America (Honicke and Broadbent 2016; Hwang and Hsia 2016; Kirk 2014; Ryan 2015;), Europe (Angrist 2014; Roicki 2019), Asia (Najmi, Raza, and Qazi 2018), Tanzania (Mosha 2017), Nigeria (Olalekan 2016), and South Africa (Bosman and Schulze 2018; Odeyemi-Bsd 2020), all of which established that learners do not rely on their peers in most cases to achieve academic breakthroughs; rather, they motivate themselves through independent learning, and thereby succeed academically. The study also showed that learners perceived the influence of peer relationships on academic performance as a weak link among Tshwane municipality grade 9 learners. This finding on peer relationships and performance was also in tandem with studies in America (Kirk 2014; Ryan 2015) which showed that peer relationship influence was prevalent in tertiary institutions rather than secondary school settings. The studies mentioned above show that peer relationships are not a cogent factor capable of influencing learners' performance. This can be explained in two ways: It has been observed that mature or older learners in America detest discussing their academic results with friends; furthermore, their study processes are not made known to their mates (Kirk 2014). It is also an indication that peers do not have a clue about marks obtained, and how long it took for assignments to be finalised by learners. This can actually make room for deception in giving actual information to peers while growing. It is also possible for peer relationships to reach a heightened level with time, but learners may be able to repel academic pressure arising from peer interactions more promptly over time.

Learners have also revealed that peer relationships do not really aim at peers or learners' academic tasks, but mostly focus on social activities. Meanwhile, in the process of growing up, learners tend to rate their independence. In this process, they also focus on unhealthy peer relationship, and on antisocial dispositions in society, which has nothing to do with academic success (Kirk 2014). In contrast, some studies in America (Boechnke 2018; Rambaran et al. 2017), Asia (Kadir, Atmowardoyo, and Salija 2018), Nigeria (Temitope and Ogunsakin 2015), Kenya (Duflo. Dupas, and Kremer 2009), and South Africa (Buhs, Ladd, and Herald 2006; Brown and Klute 2003; Odeyemi-Bsd 2020) have shown that peer relationships are pivotal to learners' increased academic performance. A possible reason for the contrary position between these studies and the finding of the current survey that peer relationships have no impact on learners' increased performance may be because of learners' geographical location. Such locations may involve schools where tracking is involved, while some may also be in the university context; however, the schools investigated in this study were regular secondary schools and the results indicate that peer relationships are not linked with Tshwane grade 9 learners' mathematics performance.

Perceived Strategies to Improve Grade 9 Learners' Academic Performance in Mathematics in Tshwane Municipality

This section deals with participants' responses derived from the open-ended items on their perceptions of possible strategies for improving their mathematics performance regarding peer relationship and academic performance.

The study posits that Tshwane grade 9 learners perceived that it was necessary for learners to relate positively with each other. The learners revealed that the coming together of learners makes it possible for them to cooperate and learn together. The learners also established in their own view that their mathematics performance can be improved through interactive and cooperative learning. They opined that cooperative learning gives room for better discovery among themselves.

The following extracts generated from the open-ended items from the grade 9 learners confirm the above statement.

> I perceive that the need for cordiality among learners will improve their learning activities.
>
> When learners are paired with better learners in mathematics, they will excel academically,
>
> Friendly peers that are not bullies to other learners will help other learners to perform better academically.

From the responses generated by the respondents in the study, the perceived possible strategies suggested for improving their academic performance in mathematics were as follows: cordial interactions among learners in learning activities (when learners have cordial relationship with each other, they can be of assistance to those who are not doing well in mathematics by helping them to learn and know the task to be done); pairing learners with other better learners in mathematics; and friendliness, which includes the avoidance of bullying by peers. These strategies are summed up as the peer mentor-mentee strategy.

Conclusion and Recommendations

The study confirmed that Tshwane grade 9 learners' perceptions of the influence of peer relationships on academic performance was poorly appraised, and was perceived as not having any influence on academic performance. A number of recommendations were further suggested, including that teachers and stakeholders in schools should consider the advocacy of positive peer relationships among learners to help foster acceptability among learners.

It was further recommended that stakeholders in education should advocate for cooperative and interactive learning among learners; in so doing, learners would be able to learn effectively from each other, thereby promoting peer mentoring.

Limitations

The major limitation of the study was funding; if funds were available, the nine South African provinces would have been covered in the study.

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