Explore Conducive Learning Environments that can influence Novices Learning Linear Programming at Munkuye secondary school. A Hermeneutic approach

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ABSTRACT

Concerns have been expressed by Zambian stakeholders regarding the trend of pupils performing poorly academically in linear programming. The conditions in which learning occurs all have an effect on pupils' motivation and achievement. The current study employs a qualitative methodology to investigate how Munkuye Secondary School's positive learning environment helped pupils' ability to learn linear programming. In total, twelve pupils were gathered to participate in focus groups and individual interviews centered around their perspectives on the educational environment at the school.

An interpretive approach study was undertaken at Munkuye to determine how best to build a learning environment for teaching linear programming and how it impacts pupils' subjects. Twelve learners participated in all, eight of them were females and four were male. These were Munkuye Secondary School pupils in grade twelve. Every participant was chosen using purposeful sampling. Interviews and discussions were used to collect the data, which was then thematically analysed.

Until now, the administration of the school, the quality of the teachers, the style of instruction, and the pupils' careless attitude toward their studies have all received priority attention as factors that impede learning. A pupil's academic performance was significantly influenced by their learning environment. The results offer recommendations for improving the environment's efficiency and competitiveness, including sufficient funding for the field of education, effective administration of school operations, and policies that either facilitate or impede pupils' ability to study.

Keywords: Academic Performance, Evaluation, Learning Environment, Pupil, Zambia.
1. INTRODUCTION

A favourable educational setting is a practical space that makes it easier to gather, organize, and apply knowledge. People learn in environments designed for learning. These can include premises like classrooms, or educational institutions; virtual spaces like online learning environments; and spaces that combine digital and physical elements. The learning environment is the location where people co-create expectations and experiences.

A secure and comfortable learning environment should be provided by learning environments. They should also give pupils the chance to socialize and have access to tools that support their learning in many settings where individuals come together to grow and learn. The purpose of learning environments is to give pupils the chance to learn freely.

Another name for learning environments is learning spaces. Typically, learning environments are created to facilitate the growth of knowledge and abilities in a specific field. They can be made for usage by individuals or groups in official contexts like offices or classrooms. All of this takes place in an authentic setting with various bureaucratic and cultural standards, such school rules.

Statement of the Problem

Pupils' on-going proficiency in linear programming could have a detrimental effect on the country's academic achievement and that of the individual pupils. It is unclear what the learning settings of pupils who attempt to answer exam problems linked to linear programming are, despite the fact that their failure rate is substantial.

1.1. Purpose of the Study

Explore Conducive Learning Environments that can influence Novices Learning Linear Programming at Munkuye secondary school.

1.2. Research Objectives

The study was guided by the following research objective:

i. Explore how learning environment affect Pupil’s Academic Performance.

ii. Describe how Teachers can foster a positive learning atmosphere

1.3. Significance

Could help educational institutions build inclusive education policies. The research holds significance for teachers, pupils, and the nation as a whole, since it may contribute to the understanding of how to apply linear programming to assist pupils in making more informed decisions regarding their academic work and behaviour. The information gathered in this study may also be useful to businesses and economists in their daily operations, as they contribute value to the nation.
2. STUDY METHODOLOGY

2.1. Research Design

In order to investigate how pupils' learning environments affect their academic performance in linear programming, a hermeneutic phenomenology design was used. The study was qualitative in character, using methodologies and techniques of qualitative research under the given approach. This is due to its strict adherence to specific methods, like data analysis techniques and sample protocols (Mulenga, 2015).

Additionally qualitative in nature, the study sought to evaluate people's statements in order to look for supporting information, validate interpretations, and gauge the data's internal consistency (White, 2018). Furthermore, the study's qualitative nature stemmed from its goal of offering a comprehensive picture of the senior secondary school educational setting in a specific district (Harrison, et al., 2017). In this study, only qualitative methodologies were used. According to Shava & Nkengbeza (2020), it is an investigation that takes a naturalistic viewpoint on events that take place in certain contexts. Hermeneutic phenomenological design was used in the study.

According to Guimond-Plourden (2009), this method placed subjectivity at the center of knowledge production. Methodologies for phenomenology were proposed by Dangal (2020); the hermeneutic phenomenological approach was chosen for the present study. This is so that, instead of only giving a detailed account of the facts, hermeneutic phenomenologists are free to interpret the implicit, unconscious, and hidden meaning they believe to be present in the phenomenon they are studying (Simui, 2018). Thus, this study examined participant perspectives regarding how the educational environment affects pupils' performance in linear programming.

2.2. Research Sites

Munkuye Secondary School is situated in the Nkeyema district of Zambia's western province.

2.3. Target Population, Sample Size and Sampling Procedure

2.3.1. Study Population

The targets were grade twelve pupils who were at Munkuye secondary school in 2024.

2.3.2. Sample Size

The study had 12 participants comprising 7 females and 5 males.

2.3.3. Sampling Procedure

To choose participants for this study who could provide in-depth information regarding the phenomena, the researcher used a homogenous purposive sampling technique (i.e., pupils in grade twelve). According to Denzin & Lincoln (2017), this meant that participants in purposive sampling were selected based on their familiarity with the requested information. Stated differently, purposive sampling facilitates the researcher's understanding of the specific phenomena.
ability to use judgment to choose the most suitable participants to address the research questions and achieve the study's goals. Thus, the purpose of purposive sampling is to choose individuals who would enable the researcher to gain a thorough understanding of the phenomena, rather than extrapolating findings to a broader population (Makondo & Makondo, 2020).

2.4. Research Instruments, Data Gathering and Analysis Procedure

2.4.1. Research Instruments

The instruments utilized to collect data from participants were semi-structured interview guides and focus group discussion guides, which encourage interaction and dialogue with the participants (Wahyumi, 2012). The study findings are more credible when a range of techniques are used, as multiple points of view are used to collaborate and triangulate the facts.

2.4.2. In-depth Interviews

Extensive interviews were conducted with the intended audience. One-on-one interviews with participants were conducted while the researcher took notes. To obtain a great deal of insightful information on the research issue, in-depth interviews were employed. The instrument has several benefits. Among them are the following: in-depth interviews improved secrecy and privacy; participants had the opportunity to ask questions when they were unclear and the researcher had the opportunity to clarify; and the researcher was able to gather a wealth of insightful information.

2.4.3. Focus Group Discussions (FGDs)

Participants in the focus group talks were divided into groups of five. Focus group talks promote dialogue and mutual understanding, particularly when tackling challenging topics. It makes it possible to examine both the parallels and contrasts in experiences and ways of thinking (Lewis, 2010). This promotes shared perspectives and comprehension. According to Moyle (2013), focus group conversations also have the advantage of allowing the researcher to listen to the participants, which empowers them in and of itself. In order to allow participants to go into further detail about topics that came up in the one-on-one conversations, the researcher played a moderate role. The instruments utilized to collect data encouraged communication and interaction (Wahyumi, 2012).

2.4.4. Data Analysis

Given that the study was entirely qualitative, themes were developed by grouping participant ideas that were comparable (Mufalo and Kabeta, 2019). The generated data was therefore subjected to a thematic analysis.

2.4.5. Ethical Considerations

In order to maintain their anonymity, the participants gave the researcher their consent. All participants were also given the assurance that the information collected would be handled strictly, with the utmost confidentiality, and used only for that reason. This was made possible by adhering to the ethical standards...
put forth by Kimmel (2014), which include obtaining ethical clearance, getting participants' agreement, ensuring their anonymity, and assigning them *pseudonyms*. As previously mentioned, Kimmel's (2014) highlighted ethical norms were fully taken into account.

3. STUDY FINDINGS AND DISCUSSION

For both learning and performance, the learning environment is crucial. Pupils can acquire knowledge efficiently in a supportive setting. A bad learning environment might hinder pupils' capacity to learn *[spatiality]*. Pupils feel more appreciated in an upbeat and supportive environment. Pupils that are passionately interested in a subject learn better and have a good attitude on it, according to Tanveer et al. (2019). When teachers adopt innovative teaching methods and there is strong teacher-pupil interaction, students usually perform better.

Enu et al. (2015) found that pupils generally perform well in a classroom or school setting where teachers are inspiring. Pupils that are more receptive tend to be happier and approach learning with a more prolific mind-set (Lin et al., 2018). It is adequate to state that pupils' perceptions or opinions regarding linear programming proficiency was lacking. The findings came to light following the interviews of twelve (12) participants.

Consequently, two (2) pupils stated the learning atmosphere was fairly excellent, two (2) pupils claimed it was good, and eight (8) pupils felt it was awful. This suggests that the educational setting was inadequate to affect pupils' academic achievement in linear programming. It is crucial to demonstrate how a pupil's learning environment has an important influence on their academic achievement. This is so because excellent instruction depends on pupils having a solid comprehension of the subjects being taught in a supportive setting (Shayna et al., 2023). It is also evident that inadequate learning environments in all areas of instruction can result in pupils receiving below-average scores on exams. Therefore, having a top-notch learning environment is beneficial to pupils and can improve their performance, particularly in linear programming.

Teachers must provide a more constructive and comprehensive environment in order to minimize any delivery issues that can prevent learners from gaining the information and abilities they require for success. Environmental elements that affect learning and academic accomplishment in pupils include proper colouring, lighting in learning environments, and open space in schools (Gilavand, 2016). Throughout the participant conversations, the subject of a poor learning environment kept coming up. *Dzoka*, for instance, stated the following, as shown in the verbatim transcription:

> “Teachers who contemplate learning environment help pupils to do well and pupils got the concept without difficulties. The teacher who make sure that learning environment is favourable makes pupils to have an interest in the subject thereby inspiring the pupils to work extremely hard” (*Dzoka*, 10.01.2024).
The conclusions above are consistent with those of Eimuhi & Ogedegbe (2016), who evaluated the data and concluded that more enriched learning settings yield larger and broader benefits to pupil outcomes, including academic achievement.

Similar thoughts were expressed by Denka-2024, another participant, who said that,

“With focus on level of learning environment, significant learning can be achieved. Where children understand the explanation of the topic, pupils tend to do better because they have passion and this produces a real desire for learning that should be at the heart of any school’s provision and needs relentless focus on the part of everyone from the learner to subject leaders” (Denka, 10.01, 2024).

The claim is in in tandem with Bolliger & Martin’s (2018) thesis that a pupil's capacity to learn is greatly impacted by their level of process satisfaction, skill development, and academic engagement. Similar to this, Lu et al. (2014) assert that peer-to-peer interactions, the curriculum, and teacher-pupil strategies all support a genuine desire to learn.

Another participant, (Milai-2024) commented that:

“I did not like the learning situation. The school had few desks making it difficult to sit properly. This affected learning. It did not matter as to whether I understood the topic or not, I had to be present. The performance was not good because lack of infrastructure” (Milai, 18.01, 2024).

The aforementioned decisions support Ezike (2018) conclusion that educational achievement is correlated with both the classroom atmosphere and pupils’ academic interests.

Contrary to a passive learning strategy, engagement with learning demonstrated a scholar's willingness and aptitude for participation in their education (Annansingh, 2019). Pupils experience more engagement with the lessons they believe that what is taught has practical applications. Additionally, pupils reported that opportunities to put their learning into practice improved their understanding of their own professional paths:

However, (Mungo-2024) stated that:

“I did not understand anything in linear programming because the teacher was struggling in teaching the topic. I recall the teacher telling the class that don’t waste time answering any question on linear programming. This was so because, teachers concentrate on the subject he was comfortable with and neglect the others topic especially linear programming” (Mungo, 25.01, 2024).
The aforementioned consequences support Cayubit (2021) assertion that teachers’ employment of more innovative teaching and learning tactics, design of classes, and interactions with peers all improve student knowledge.

The confidence of the pupils also surfaced as a motif, and (Bika-2024) noted that:

“Pupils lost confidence and the master of topic content due to congested classes and teacher failure to mark books. I could not tell whether the task given I answered it correctly since there was no feedback from the teacher. The teacher did not care whether pupils understood the questions better and apply the concept,” (Bika, 22.01, 2024).

The aforementioned discovery supports Becton (2017) assertion that favourable learning environments don’t appear by accident or happen by themselves. They should be developed by deliberate actions such as having positive interactions with pupils and modeling actions that support activities in the classroom.

Further, (Lonjo-2024) stated that:

“For more confident pupils, you could see the difference in that the majority of the pupils in class listened to teachers and pupils interact with a higher level of engagement” (Lonjo, 17.01. 2024).

The evidence cited above corroborate Study.com (2018) assertion that various learning environments differ from knowledge-centered, assessment-centered, or community-centered learning environments in that they contain distinct components. Learner-centered encourage pupils to actively expand their own knowledge (Federation University, 2018). Through innovative learning activities, pupils are encouraged to delve deeply into difficult ideas in knowledge-centered learning environments.

The data also revealed the topic of "ineffective teaching." The twelve (12) participants all agreed that a decent learning situation can increase pupils’ academic performance. Pupils that pay attention to what they are taught perform well. This is only possible if educators become more productive and efficient in the classroom. Mano-2024, a participant, said the following:

“I was facing challenges in graphing variables. This was as a result of inefficiency and ineffective teaching by my teacher. Some pupils showed greater enthusiasm as they value the subject more and studied hard in order to deepen their knowledge” (Mano, 30.01. 2024).

The findings that have already been mentioned support Shamaki (2015) claim that pupil performance is affected. Similarly, Adamu (2015) stated that using instructional resources, having a small class size, and having a well-furnished classroom all improve pupil performance and conceptual understanding.

(Wilo-2024) stated that:
“I was facing challenges in learning linear programming because there were no learning resources. This resulted to ineffective teaching by my teacher.” (Wilo, 16.01. 2024).

The disclosure above is consistent with the elements that make up the learning environment affects learning curve of the pupil. People, technical tools, learning resources, and teaching materials are listed by Balog (2018) as these components that affect performance.

The inspiration of pupils has been found to suffer when teachers teach in abstract.

I’ve had a difficult time to grasp the concept in linear programming due to non-availability of teaching aids. The teacher would speak continuously during the entire lesson. It’s unprofessional... (Kumba, 12.01.2024)

This finding is in line with Waldman's (2016) discovery that pupils cannot succeed academically unless they feel at ease in both their physical and mental environments. A secure setting for learning also requires pupils feel appreciated, supported, and welcomed. Raccoon Gang (2018) asserts that individualized learning supports critical thinking, the application of information and knowledge for the resolution of complex problems, collaboration, effective communication, and the advancement of academic mind-sets that greatly increase pupil engagement.

The learning environment also includes relationships. This dimension contains the following subthemes: group work, peer interaction, and faculty support. The majority of pupils made comments regarding how the teachers affected their education. Teachers can assist establish a harmless planetary in the teaching galaxy by offering extra development tools, fulfilling requests, maintaining a courteous attitude, allowing pupils to share concerns without fear of condemnation, and merely listening to them. The majority of pupils claimed that the teachers at this school were never willing to offer assistance and that they truly did not care about them or their education. Teachers were perceived as unfriendly and undemocratic.

“I think it’s essential to feel secure in the setting and to feel free to ask any questions without being judged. And receive a response that genuinely benefits.” (Gongi, 12.01.2024)

This data bolsters the claim made by Raccoon Gang (2018) that collaboration, meaning-making, and respect for the diversity of perspectives that influence knowledge creation are the main priorities in community-centered settings. While small number of pupils said they felt comfortable and accepted, most percentage discussed negative experiences they had with the teachers’ lack of support. Pupils related experiences when they were interrupted by teachers who labelled them as "irrational," when their pleas for additional help were denied, or when their inquiries went unanswered.

Another pupil thought that the faculty’s inaction occasionally added to the unfavorable atmosphere:
“I've had bad teacher who could not pay attention to pupils cry. If a pupil asks a question he could not guide the learner.” (Haleka, 11.01, 2024)

This result supports the claim made by Tharani et al. (2017) that teachers should provide support to help pupils develop a positive attitude toward learning. This promotes emotional health and a greater interest in learning. The topic's structure, the strategies the teacher will employ, and the usage of more inventive teaching and working methods can all have an impact on how engaging and intriguing the subject is for the students (Cayubit, 2021).

Collaboration among peers promotes pupils to interact with one another both within and outside of the classroom.

Pupils engaged with their peers most frequently during class or an assignment:

“I think the way the class is structured really helps build relationships with other peers. For example, I met some peer and had several discussions with each other. Through more proactive conversations, students build a bond. It is essential to have a study partner or someone to help you.” (Kuna, 09.01.2024)

Some pupils thought they didn't have enough opportunity in class to socialize with their friends, though. Pupils requested additional opportunities to communicate with peers, even if some participants believed that attending school was more about improving grades than it was about making friends. Learners must also experience a feeling of inclusion in the staff, other pupils, and teachers. Schools can encourage these relationships by focusing on the social and emotional development of their pupils. Pupil participation, achievement, and the roles that teachers, peers, parents, and community members play can all help to increase performance (Waldman, 2016).

The unique personality of the teacher plays a critical role in the academic setting of the pupils. They are essential components of a favourable teaching-learning environment that will facilitate an easy, enthusiastically flexible, and beneficial learning experience (Usman, 2016). The type of conduct that comes depends on how the teacher engages with each student's individual personality (Brown, 2015).

“The encouraging learning environment help pupils learn and are motivated to learn.” (Kuna, 09.01.2024)

Pupils' cognitive, emotional, and social performance in the classroom depends on having productive learning environments (Annansingh, 2019). An atmosphere that is favourable for learning doesn't merely appear by accident. They should be developed by deliberate actions such as having pleasant interactions with pupils and modeling behaviors that support learning activities in the classroom (Becton, 2017).
4.1.2. Teachers to foster a positive learning atmosphere

The curriculum, the interactions between students and teachers, the level of skill development, the satisfaction of the pupils with their academic experiences has all been expressed as their assessments of teaching. Addressing the problem, linear programming requires involving pupils. Pupils need to devote a lot of time and effort to the subject for them to stay motivated to master it (Rusticus et al., 2020). By promoting efficient teaching and learning, schools with suitable learning environments help to stimulate expected learning outcomes that support strong academic performance (Duruji et al, 2014).

They ought to be considered active participants rather than just as passengers. According to Rusticus & Justus (2019), teacher expertise is also indispensable. Higher levels of satisfaction for both social and academic experiences have been reported by schools with more chances for student involvement and activities (Charles et al., 2016). It is expected of teachers to exhibit proficiency in the pedagogical content knowledge. Constant and frequent feedback and remediation from the teachers is also crucial. Giving pupils feedback and remediation inevitably boosts their linear programming performance.

Pupils that are passionately interested in a subject learn better and have a good attitude on it, according to Tanveer et al. (2019). Pupils often perform better when there is strong teacher-student interaction and when educators employ innovative teaching strategies. Remediation helps pupils make up any inadequacies so they can compete on an equal footing with other students. Teachers that employ interactive techniques get their pupils to participate actively.

Project work, group projects, and discovery approaches are good ways to teach and learn linear programming. When humor is used as a teaching approach, pupils perform better because the instruction is engaging and pleasant (Ngussa and Mbuta, 2017). According to Enu et al. (2015), pupils typically capacity to succeed in a classroom or school environment that teachers view as supportive.

5. CONCLUSION

According to the survey, previous pupils of Munkuye Secondary School had subpar performance records. This was ascribed to a variety of issues, including teachers' insufficient subject expertise, pupils' lack of confidence in the subject, difficulties graphing variables, and pupils' inability to identify variables and their units. As a result, pupils who were just beginning to use the problem-solving strategy needed a lot of assistance. In order to help pupils develop flexible thinking patterns and applications, group work should be promoted. Research has indicated that learners' performance is impacted by teachers' qualifications, lack of preparation, negative attitudes, and inability to teach effectively (Mwambazi et al., 2023).
6. RECOMMENDATION

Based on the research findings therefore, the study recommended the following:

i. In order to improve successful delivery, teachers should use proper teaching techniques, particularly for learner-centered activities where pupils have a key role in the process of instructing and learning. To help pupils learn more, this should also involve using a range of teaching aids and techniques.

ii. It is imperative to regularly monitor, supervise, and evaluate school activities in order to gauge pupils' engagement, participation, and comprehension. Additionally, help should be provided to teachers who do not possess the necessary skills to enhance the learning environment.

iii. The education sector should have sufficient funding to enable it to purchase the equipment required to provide a highly flexible, practical, and sustainable learning environment that satisfies Zambia's educational objectives.

iv. The appointment of seasoned teachers and administrators with a solid reputation and background is appropriate for school administrators. As a result, they will be able to establish rules and manage the educational establishments to satisfy international norms.

v. To ensure that pupils possess a firm grasp of the tenets and philosophies of education, teachers—who serve as the conduit between information and learning in our educational system—should have regular opportunities for training and retraining. This would contribute to the regularization of environment and guarantee quality control in Zambia's educational system.

vi. Encouragement of community involvement in school administration would foster a positive school-community relationship and improve the safety of teachers, pupils, and learning environments.

vii. Teachers should have access to a welfare system and good pay that recognizes their efforts and gives them hope for the future. This would help them be recognized as skilled workers rather than as the seemingly inexpensive labour of today.

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