

Perceptions of Inquiry-Based Mathematics Instruction in Technical and Vocational Schools in Ghana

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The objective of this qualitative research study was to explore the perceptions of teachers and students regarding the effectiveness of the inquiry-based teaching approach in enhancing students' understanding and enthusiasm for mathematics at the Senior High level of the Technical and Vocational Education within the Ghanaian Education System. Overall, teachers expressed positivity about the Inquiry-Based Teaching Approach (IBTA) and were receptive to implementing it in their classrooms. Students participating in the study highlighted the positive impact of IBTA on their understanding of concepts and advocated for its regular use. The researcher employed a case study methodology, involving 40 first-year students from KATVI who were selected through purposive sampling. These students experienced instruction through the inquiry-based teaching approach. To gather perceptions on the effectiveness of IBTA compared to the conventional lecture method, three teachers were randomly chosen among 14 mathematics teachers in the school to observe the researcher facilitate the sampled class using IBTA for six weeks. Subsequently, three students from the class were randomly selected to participate in the interview process.

Keywords: inquiry-based teaching approach, technical and vocational education, lecture method

In Ghana, many mathematics teachers at both the junior and senior high school levels focus primarily on preparing students for the West Africa Examination Council Examinations (BECE and WASSCE), often prioritizing grades over students' genuine understanding of the subject. This emphasis placed on examination performance of students influences important decisions made by stakeholders, including school rankings, teacher accountability, and student admissions especially from the junior high schools to the senior high schools in Ghana. Consequently, teachers face significant demands and challenges that often result in a reduction of student-centered instruction, leading to limited interaction between teachers and students during lessons. As a result, there is less time dedicated to inquiry learning and critical thinking, as mentioned by Bailey (2018) and Fickel (2006). This shift towards teacher-centered instruction can negatively impact students' problem-solving and critical thinking skills, which are essential for academic and professional success, especially for students pursuing Technical and Vocational Education and Training (TVET). Cooper and Murphy (2016), Jensen (2016) and Wagner (2014) emphasize the importance of addressing these negative consequences to ensure that students develop the necessary skill sets for their future careers and overall excellence.

It is an undeniable fact that mathematics is a key tool in national development. It is therefore, important that its effectiveness is harnessed and used appropriately to aid in development as it is expected (Asante-Mensa et al., 2024). However, most students perceive mathematics as a difficult subject and this, to some extent can be attributed to the way mathematics is taught in the various schools. The role of mathematics in everyday life especially in the achievement of the sustainable development goals is undoubtable. It is therefore incumbent on mathematics teachers to foster mathematical understanding and competence in students across all levels of education (Agbata et al., 2024a).

However, in most schools in Ghana, mathematics is presented to students in the conventional lecture method which is a one-way stream where the teacher speaks, writes and asks students to copy and memorized verbatim what he the teacher has given out (Asante-Mensa et al, 2024). The teacher assumes that mathematics is a fixed body of knowledge that the student must come to know and it is only he, the teacher who can deliver such knowledge to the students. Lessons are usually dominated by direct and unilateral teacher disseminating information to mostly passive and unconcern learners (Asante-Mensa et al., 2024, Wonkyi & Adu, 2016). This kind of teaching delivery ignores the student and therefore does not help to develop students heuristically in the field of mathematics.

The inquiry-based teaching approach empowers students to take an active role in their learning journey. As highlighted by Abdi (2014) and Asante-Mensa et al. (2024), this approach allows students to explore and construct knowledge independently, fostering a deeper understanding and ownership of their education. However, to implement this all-important teaching method, it

has become essential for educational policy makers to know how students who are at the center of this perceive the Inquiry-Based Teaching Approach.

Students' perception of mathematics plays a critical role in the educational landscape and is of significant concern to stakeholders (Asante-Mensa, 2023), just as other factors influencing their learning. Negative perceptions can lead to poor performance and a lack of interest in the subject, which stakeholders continually strive to address. These perceptions are often shaped by students' early educational experiences, as Arthur et al. (2017) suggest. Ali (2013) further emphasizes that students' academic experiences can strongly influence their liking or disliking of mathematics. Consequently, a general lack of interest in mathematics, stemming from these negative perceptions, has led to its avoidance by many students in African countries, including Ghana.

According to Arthur et al. (2017), many students believe that those who excel in mathematics are naturally gifted; this perception generally leads to a complete disregard of the hard work and effort invested by their peers in understanding mathematical concepts. Again, this perception creates a mindset where personal effort is deemed insignificant in achieving mathematical success, as individuals believe that their lack of achievement is beyond their control and attributed to a supposed supernatural endowment that they have not received. Unfortunately, these negative perceptions about mathematics have hindered students from realizing their full academic potential in the subject.

It is believed that negative perceptions about mathematics can be eliminated by employing effective teaching methods that actively involve students in the learning process (Asante-Mensa et al., 2024, Ampadu, 2012; Siegle et al., 2014). It is important to recognize that the way mathematics is presented to students can contribute to mathematics anxiety. Teachers, therefore, play a crucial role in shaping students' perceptions of mathematics and can also work towards eradicating negative beliefs (Arthur et al., 2017). Arthur et al. (2017) further emphasize that by understanding students' perceptions; teachers can select appropriate strategies to enhance the teaching and learning of mathematics.

Agbata et al. (2024b) posit mathematical concepts bright like stars in the night and with an intrinsic beauty and that mathematics in itself is a game with simple rules. This implies that teachers of mathematics should engage students in such a way that the students will be able to determine the rules of the game and not just hand them over to them. Hence the need for an effective teaching method such as the inquiry-based teaching approach.

Inquiry-based learning is a teaching approach that empowers students to create their own knowledge, fostering the development of critical thinking skills. This developed critical thinking skills enable students to acquire, analyze, synthesize, evaluate and process solutions while solving mathematical problems (Dooley et al., 2014; Sumarna et al., 2017; Wu, 2014). In an inquiry-based learning environment, the classroom transforms into an open space where

students actively explore, ask questions, investigate, and research to address their misconceptions about a particular phenomenon (Asante-Mensa, 2023). It is a constructivist approach that aims to assist students in constructing meaning and understanding with minimal direct instruction from the teacher.

In contrast, the conventional lecture method often resembles a one-person performance, with the instructor dominating the lesson while students remain passive and unengaged. In this approach, an instructor unilaterally delivers information to seemingly passive and disinterested learners. Practitioners of the conventional lecture method assume that there is a fixed set of knowledge that students must acquire, and they believe that only the instructor possesses the ability to impart this knowledge. Students are expected to accept the information without question or criticism (Abdi, 2014). The teacher's goal is to transfer thoughts and meanings to the passive students, leaving little room for student-initiated inquiries, independent thinking, or interactions among peers (Abdi, 2014).

The conventional lecture method, as a teacher-centered approach, revolves entirely around the instructor, who becomes the sole source of knowledge in the classroom. This method assumes that all students possess the same level of prior knowledge in the subject and have the same absorption rate, implying that they can grasp the material at the same pace (Abdi, 2014). According to Akther and Fatima (2016), the lecture method encourages passive audience called students whose sole responsibility is to record, memorize and recite to the admiration of the teacher. This implies that the lecture method only promotes rote memorization and not understanding of laid down principles and theories of mathematics.

Carvalho et al. (2011) posit the use of inquiry-based instruction is beneficial for enhancing the intrinsic motivation of students. This creates an internal joy which accelerates the ability of students to learn mathematics and also reduce if not eradicate completely the fear student's usual have for mathematics. Inquiry-based teaching in essence can help produce new generational thinkers, who in effect can help contributes to the development of society scientifically.

Theoretical Framework

In recent times, the inquiry-based teaching approach has become a vital tool in the hands of educationist globally. In fact, its importance in teaching, learning, and curriculum development cannot be over emphasized (Eltanahy & Forawi, 2019). One of the advantages of the inquiry-based teaching is that, it allows students to construct knowledge on their own. The inquiry-based teaching approach theoretically conforms to the constructivist philosophy of teaching and learning. However, the constructivism theory draws its strength from the ideas of Dewey, Piaget and Vygotsky (Asante-Mensa, 2023; Lister, 2015; Mooney, 2013;). Constructivism is a philosophical ideology which

concerns how people learn to acquire knowledge. It is one of the five major learning theories, which argues that children construct knowledge and meaning by combining their experiences with the world around them with their existing ideas (Asante-Mensa, 2023; Kim, 2017; Minner et al., 2010; Mooney, 2013; Tamin & Grant, 2013;). It was developed as a contrast to behaviourism theory which encourages the more traditional formal teaching environment in which children learn information by rote and spent days reciting facts out of context (Mooney, 2013).

This study employed Vygotsky's social constructivism theory of learning because of the significant role it plays in helping students to generate their own knowledge, form ideas and create meaning from this new knowledge based on their previous observations and experiences (Mukandayisenga et al., 2021). According to Serafin et al, (2015), in a constructivist classroom learners search for knowledge and organize this knowledge, develop it, expand it and share this new refined knowledge with their colleague learners through collaboration and cooperation. This means that inquiry-based learning encourages collaboration and cooperative learning among learners.

According to the theory of constructivism, learning is not merely the transfer of knowledge from a more knowledgeable person to a less knowledgeable one. Instead, it is the act of the learner reconstructing knowledge through their own observations and experiences. Vygotsky's idea of constructivism emphasizes that knowledge acquisition should be a shared endeavor between the facilitator and the learner, and thus, knowledge should be co-constructed. This means that learners should take an active role in the teaching and learning process, sharing their findings with each other under minimal interference from the facilitator. This approach fosters independent, cooperative, and collaborative learning, encouraging the development of communication skills and self-confidence in learners. By engaging with each other and their facilitator, learners actively construct their own understanding of the world around them.

One of the most vital concepts of Vygotsky's constructivism theory is that of the Zone of Proximal Development (ZPD). Vygotsky referred ZPD as the gap between the most difficult task a learner can perform independently and the most difficult task a learner can perform with help. Vygotsky again posit that a learner in learning a new concept may benefit from an interaction from a facilitator or a peer. This assistance the learner obtains from a facilitator or a peer is referred to as scaffolding (Mooney, 2013, Mukandayisenga et al., 2021).

Hence, this study was very well suited to the constructivism theory that emphasized collaboration, cooperation and team work among learners in an inquiry-based learning environment for constructing knowledge through activities.

Research Objectives

The following research objectives guided the study:

1. To find out the level of knowledge of teachers in the Inquiry-Based Teaching Approach (IBTA).
2. To understand the perceptions of both teachers and students regarding the effectiveness of the Inquiry-Based Teaching Approach.

Research questions

Based on the objectives outlined above, we formulate the following research questions:

1. What level of knowledge and understanding do teachers have regarding the Inquiry-Based Teaching Approach (IBTA)?
2. How do teachers and students perceive the effectiveness of the Inquiry-Based Teaching Approach?

To achieve the objectives of determining the perception of teachers and students on the effectiveness of inquiry-based teaching approach over traditional lecture method, three teachers were selected randomly to observe the researcher during the intervention after which three students from the experimental class were also selected randomly to take part of the interview process.

Methodology

Qualitative research methodology was employed in this study due to its unique strength in explaining complex human behaviors, patterns, and processes that are often challenging to quantify. Creswell (2012) outlines a process for qualitative data analysis that begins with preparing and organizing the data. This is followed by reducing the data into themes through coding and condensing codes, ultimately leading to the representation of findings through figures, tables, and discussions. Creswell (2018) further elaborates on this process, suggesting that researchers engage in an initial exploration of the data, code and condense the codes, and then represent their findings through narrations, visuals, tables, or figures. However, he emphasizes that these steps need not be followed sequentially, allowing researchers flexibility in their analytical approach.

The critical steps in qualitative data analysis involve collecting and transcribing the data, thoroughly familiarizing oneself with the data, identifying themes or patterns within the data, and then representing those findings through figures or discussions. In this study, the researcher followed Schilling's (2006) five-level model, as utilized in Masilo (2018), to guide the analytical process.

Purpose of the Study

Improving the quality of education in Ghana has motivated policymakers to develop and implement a standards-based curriculum that emphasizes an inquiry-based teaching approach. This approach positions teachers as facilitators of learning rather than mere transmitters of knowledge to passive students. Given the focus on inquiry-based teaching, it is essential to evaluate its effectiveness and understand the perceptions of both teachers and students to guide policymaking.

The study aimed to explore the perceptions of teachers and students regarding inquiry-based instruction in mathematics at the technical and vocational level of the Senior High School system in Ghana. By conducting a case study, the researcher sought to find answers to questions about inquiry-based learning. As Yin (2014) and Farooqi (2020) emphasize, employing a case study as a research method requires careful consideration of questions and analysis that connect the data, as well as the selection of appropriate criteria for interpreting the findings.

Design of the Study

The research design employed in this study was a case study centered on interviews, chosen for its ability to provide valuable insights and generate generalizable data. The qualitative nature of the research allowed for an exploration of participants' thoughts, observations, and experiences. As Creswell (2018) explains, the case study approach enables researchers to observe and engage in conversations that can reveal new perspectives or ideas. Baxter and Jack (2008) further emphasize that case studies are particularly useful when seeking answers to "how" and "why" questions. This design was well-suited to the study of human perceptions, where the boundaries between the phenomena and the context are often blurred. Specifically, this case study focused on exploring the perceptions of teachers regarding inquiry-based instruction in mathematics at the senior high level of vocational and technical education.

Sampling

Purposeful sampling is a common technique in qualitative research, particularly when documenting and collecting case studies related to a specific topic (Palinkas et al., 2015). In this case study, the focus was on inquiry-based teaching in mathematics within a technical and vocational institution. The sample group consisted of three teachers and three students from Krobea Asante Technical and Vocational Institute in the Sekyere East District of Ashanti Region (see Table 1).

Instrument

In a qualitative study, researchers usually make use of interview as a data collection tool (Brinkmann & Kvale, 2014). Interview is a qualitative

research method that relies on asking questions as a form of data collection (Easwaramoorthy & Zarinpoush, 2006). It involves two or more persons one of whom is the interviewer asking the questions while others answer. Interviewing is a widely used method for collecting data, and there are several ways to conduct interviews. Interviews can vary in structure, ranging from structured to unstructured to semi-structured (Gjerde, 2016; Merriam, 2009; Rubin & Rubin, 2012).

This research utilized the structured interview method to understand the perceptions of both teachers and students. Each teacher was interviewed twice: One before and one after observing the researcher implement the Inquiry-Based Teaching Approach in the classroom. This approach allowed for a deeper understanding of the participants' experiences and perspectives.

Table 1

Participants Qualification and Experience

Teacher	Sex	Qualification	Teaching Experience	Grades Taught
Teacher 1	Male	1. M.Phil. Pure Mathematics 2. BSc. Mathematics 3. Teachers Certificate 'A'	23 years mathematics teaching experience in three schools	Grades 7 – 11
Teacher 2	Male	1. BSc. Mathematics Education 2. Teachers Certificate 'A'	17 years mathematics teaching experience in three schools	Grades 8 – 12
Teacher 3	Male	1. B.Ed. Mathematics 2. Teachers Diploma in Basic Education	7 years mathematics teaching experience in two schools	Grades 8 – 11

Teacher Interview

Before the teachers were allowed to observe the researcher use inquiry-based teaching in the classroom during the intervention, a 30 minutes duration interview was arranged with the teachers to ascertain their background, their views on mathematics teaching and learning and the use of the inquiry-based teaching approach as an instructional method in the teaching of mathematics in a technical and vocational institution. A post-intervention interview was conducted and it concentrated only on teacher's perception on the inquiry-based

teaching approach soliciting particularly their views and reflections on the effects of the lessons taught by the researcher using IBTA on the students. The data from these interviews were used to answer the research question that sought to solicit perception of teachers on IBTA.

Results

From the interviews conducted with the teachers, the following themes were generated:

- Perception of the Inquiry-based teaching approach
- Appropriateness of implementing Inquiry-based teaching approach in the Senior High school.
- The challenges or obstacles faced when implementing the Inquiry-Based Teaching Approach in the Senior High School context.

The responses from the interviews were carefully noted, analyzed, and summarized, with key quotations presented verbatim to preserve the authenticity and richness of the participants' perspectives.

Perception of the Inquiry-Based Teaching Approach

From the interviews, it became clear to the researcher that the teachers had little or no knowledge about the inquiry-based teaching approach to teaching so their perception about the method was based on hearsay and lack of experience of the IBTA. The researcher sought to understand teachers' perceptions and knowledge of inquiry-based teaching approaches to mathematics through interviews. Despite varying levels of exposure to these approaches, the teachers shared common ideas and perceptions, providing valuable insights into their understanding and experiences with inquiry-based teaching in mathematics. All the three teachers confess to the fact that they have little to no exposure to inquiry-based teaching approaches as a classroom instruction technique as reported:

Apart from hearing of it during methodology class at the teacher training college I have not heard of it or seen anyone used it (T1). Sure, I used it at the college during teaching practice; I have never used it as a practicing teacher (T2).

Teacher 3 shared similar ideas and so it became obvious that the teachers have less knowledge about the use of IBTA as a teaching strategy in mathematics education. Again, the teachers believe that students must be exposed to activities that will enhance their creativity and self-reliance as far as learning mathematics is concerned. They say this will help student to understand and also remember what they have learnt with ease rather than taking the student through the rote memorization process.

Furthermore, the responses indicate that inquiry-based strategies promote inquisitiveness in students and leads to discovering of fact for

themselves as reported: *it helped the students to discover things for themselves and also helped in understanding the concept (T1)*. The interview responses also revealed that teachers perceive inquiry-based teaching approach as time consuming as reflected in: *it will be difficult to cover the entire curriculum with this method because of time (T3)*. Both teacher 1 and teacher 2 had similar concerns. However, they all agreed that with regular practice and proper in-service training the time could be managed. While the curriculum of the Ghana Education Service advocates for the use of inquiry-based teaching strategies, teachers lack sufficient training in this area, which may impact their confidence in implementing these strategies effectively. This was an idea shared by both Teacher 1 and Teacher 3 as reported: *I think lack of training is the reason why many of us don't use this method, though it is effective, because one cannot use a strategy, he is not confident using (T3)*.

Appropriateness of Implementing Inquiry-Based Teaching

On the implementation of inquiry-based strategy at the senior high schools, the teachers with collective opinion believe it is appropriate to use as remarked: *initially, I thought the students will feel bored because I considered them to be too mature for such activities, but they really had fun learning so it is good to engage them (T1)*. Based on this, he thinks, the use of Inquiry-Based Teaching method at the high school level is appropriate and must be encouraged.

Teacher 3 made his opinion clear about the appropriateness of the inquiry-based teaching strategy and declared his wiliness to use the inquiry-based teaching strategy as his instructive method as reported: *the use of Inquiry-Based Teaching Approach as the instructive medium was appropriate, since the learners were happy and enjoyed using the materials provided. I am actually willing to practice the method in my lessons*. The students showed more interest in the lessons to the amazement of the teachers. This is because the teachers had a misconception about the appropriateness of an activity-based lesson at such a level as teacher 2 put:

It amazed me the level of enthusiasm the students exhibited. You don't often get them this excited in class. In fact, I thought initially that they will not show interest because I assumed they will take the activities as "child's play."

Responses from the interview also indicated that although teachers deem the use of inquiry-based teaching as appropriate at the senior high school, some of them entertain fears of students getting bored with the activities if it becomes an everyday thing. This is what teacher 2 said: *well in as much as I think is a good method of teaching and I am willing to embrace it. I also think if you make it a routine practice the student will grow weary of it and it will affect learning in that sense*. This notion by the teachers readily confirms teacher 3's reason for lack of training as why teachers do not want to use the inquiry-based strategy in their classrooms. Because with proper training

teachers will be able to plan their inquiry-based teaching strategy well enough to avoid boredom among students.

The Hindrances of Implementing the Inquiry-Based Teaching

The teachers believe that one of the major hindrances to implementing inquiry-based teaching in the classroom is lack of training on the strategy. Though the Ghana education standard-based curriculum encourages the use of inquiry-based teaching strategy teachers are concern over lack in-service training and inadequate teaching and learning material to carry out activities that characterizes the inquiry-based techniques. Teacher 1 had this to say:

You see this inquiry teaching strategy is effective as it helps students to understand the concept and also increases the interest of the students in the lesson but one will need the necessary teaching and learning material to be able to plan and execute it effectively in order to achieve the needed objective. But the question is where are the materials to be used?

From the responses the teachers were concern not only of lack of training but also insufficient or inadequate teaching and learning material.

This is what led teacher 2 to:

Though training is important, teaching and learning material plays a vital role in implementing and lack of such will make it difficult to implement the inquiry-based teaching approach in the classroom.

Notwithstanding the fact that lack of material and the teacher were also concern about timing. *I cannot use all my time doing inquiry-based lessons. I need to finish what I am supposed to cover in the term before it ends and I think this method will not help that much in time management (T3).*

In fact, the responses indicate that the teacher's actual concern was on the mental capacity of the students and not necessarily the time of teaching through inquiry-based instruction.

You know in Ghana the students who come to the technical and vocational institution are of low grade and are therefore cannot perform even some simple operations in mathematics so leaving them to discover complex mathematical phenomenon will sometimes posse a challenge for them and again, not all topics in the curriculum will allow the use to inquiry because some topics are very abstract (T1).

Hence, the above responses indicate that teachers are will to implement the inquiry-based teaching strategy in their classrooms if the necessary teaching and learning materials are available. Again, they believe training in the inquiry-based instruction in needed to ascertain ultimate implementation of the strategy in order to maximize it full effectiveness.

Table 2*Students Perception of the Inquiry-Based Teaching Approach*

Questions	Student's response		
	Student 1	Student 2	Student 3
How did you find the lessons?	<i>Good and lively.</i>	<i>It was great. I really had fun cutting the cards and fixing them on the drawn figure to find the angles.</i>	<i>Interesting.</i>
Have been taught this way before?	<i>No please.</i>	<i>No</i>	<i>No, I haven't please</i>
Can you describe the way your mathematics teachers have been teaching mathematics?	<i>Yes, they state the formula when necessary and give examples. We then copy both formula and examples and practice on our own.</i>	<i>Teachers will right on the board and we the students will copy after them. They just tell us to memorize the formula and use them in the examples given.</i>	<i>We copy formulae, relations and example and practice them. Sometimes you don't even understand the formula or even the examples you are solving but you still have to practice till you get it right.</i>
So, which of the two will you prefer to be used in teaching you always?	<i>The new one. The one we have been using now.</i>	<i>The one you used.</i>	<i>Please the new one.</i>
Can you tell me why?	<i>Yes, it made mathematics simple and easy to learn. And I don't have to memorize the formula.</i>	<i>Yes, I want to see more of the activities in class so that we can have fun and learn at the same time.</i>	<i>Yeah, it gave us the opportunity to see how the formula came about. I have always held the view that mathematics is difficult, but I think if it is taught this way, then it will no longer be a difficult subject to me and I am sure others too.</i>

Students Interview

Three students from the class taught were selected and interviewed to solicit their views on the effectiveness of the Inquiry-Based Teaching Approach compared to the way they have been having their lessons. Their views were summarized and presented in Table 2.

Discussions

The interview data revealed that teachers felt they lacked the necessary knowledge and training to effectively adopt an inquiry-based teaching approach. Their own limited experience with this strategy and a lack of confidence in their ability to implement it were cited as contributing factors. Additionally, the focus on external examinations that prioritize rote memorization and recall over understanding presents a challenge. Teachers expressed concern about sustaining student interest, given that students have been conditioned to find rewards in memorization rather than inquiry. Akther and Fatima (2016) emphasize that teachers need a broad knowledge base and a range of technical skills and experiences to benefit their students. However, the current educational system in Ghana, with its emphasis on rote memorization, may hinder the development of these skills and experiences. This study highlights the need for better support and training for teachers to effectively implement inquiry-based teaching strategies and promote a deeper understanding of the material. It is therefore necessary for teachers to have frequent in-service training in order to be abreast with current and relevant teaching techniques that are beneficial to their students.

According to Dewey (1964) educational programs should be tailored to produce student who are thoughtful about educational theory and principles rather than only being skilled in routines, copiers, and followers of traditions. This simply means that education must not only be seen as a transmission of knowledge from teachers to learners but equipping learners with the vital ingredient of life. This is why it is important for teachers to practice the inquiry-based strategy. In Ghana, classroom authority and control happened to be one of the superiority keys teachers have. Hence, teacher may be afraid to change their teaching style from the lecturing method because they believe the lecturing method of teaching gives them dominion over the students whereas the inquiry-based teaching approach will give the students freedom to operate and create their own knowledge.

Conclusions

Observations from the study indicates that learners reacted positively towards learning of mathematics and both teachers' and students' interviews showed that, Inquiry-Based Teaching is appropriate and necessary to be used at the senior high school level and for that matter in a TVET institutions.

Inquiry-Based Teaching in a mathematics classroom at the Senior High Level should be guided to ensure that activities are focused and aligned with the lesson objectives. This approach helps both teachers and students stay on track and achieve the intended purpose of the lesson.

The research examined the impact of using the Inquiry-Based Teaching approach as a medium of instruction in a mathematics classroom and its effect on students' understanding and performance. It was found that Inquiry-Based Teaching involves planning activities that cater for different learning styles, such as providing explanations for auditory learners, demonstrations for visual learners, and hands-on modeling for kinesthetic learners. This inclusive approach ensured that all categories of learners were able to grasp the concepts effectively. In the study it became clear that, Inquiry-Based Teaching promotes the development of both conceptual and procedural understanding, going beyond the mere acquisition of procedural knowledge often achieved through traditional lecture methods. The data further revealed that Inquiry-Based Teaching had a positive impact on students' achievement levels in mathematics, fostering a deeper understanding of the subject matter.

Recommendations

The following recommendations were made from the study:

1. Teachers must be equipped with the necessary teaching and learning materials to enable them implement the inquiry-based teaching in the classroom.
2. Teachers must be trained on how to implement and execute a successful inquiry-based learning.

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