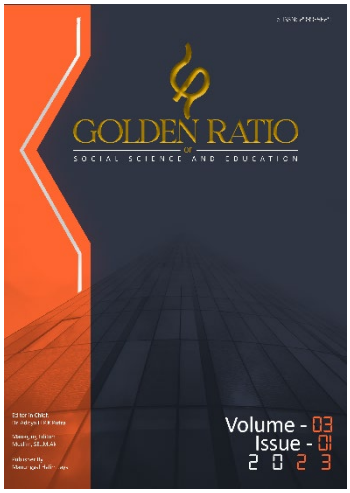
https://doi.org/10.52970/grsse.v3i1.230

Website: https://goldenratio.id/index.php/grsse/index

OPEN ACCESS

ISSN [Online] 27975827



Received: November 11, 2022
Revised: December 02, 2022
Accepted: May 27, 2023

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SOCIAL SCIENCE AND EDUCATION | RESEARCH ARTICLE

Mathematics Learning Experience at the Basic School and Its Influence on One's Program of Choice at the Institution Higher of Learning

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Abstract: This paper sought to determine if the Basic School Mathematics learning experience has any influence on the individual when it comes to program selection in higher education and career choice. The researcher employed a qualitative approach in order to obtain detailed information about the topic. This led to the adoption of the Narrative Paradigm, where one experienced person was interviewed to obtain first-hand information for analysis. It was revealed if a student develops an interest in mathematics at Basic School it improves their performance. More so such a student is more likely to enroll in mathematics-related courses as he or she moves higher on the academic ladder. It was also observed that if teachers adopt methods of teaching that are learner-centered, it motivates the learner to learn mathematics as an integral part of life but not as abstract information that needs to be chewed. The study confirmed that mathematics has various applications in the workplace, and knowledge of mathematics can be self-gratifying. The study makes the following recommendations; even though students learn as a group, the teacher must focus on the individual learners by giving them extra attention, teachers must be interested in what the students learn after school, and teachers must keep parents and guardians informed about the academic achievements progress of their wards.

Keywords: Teaching Mathematics, Learning Mathematics, Content Knowledge for Teaching, African Teachers, Constructivism, Zone of Proximal Development.

1. Introduction

Mathematics has been identified as a tool for national deployment worldwide, hence its incorporation as a core curriculum in most countries around the World (Japelj Pavesic et al., 2022). The attention allotted to teaching and learning mathematics has increased over the last three decades. Several interventions have been developed to enhance the teaching and learning of mathematics. Due to the capacity of mathematics education to provide peace and security, teaching the subject has become a global concern (Akkus, 2016; Olawale et al., 2021). This is seen in the efforts being made by the Organization for Economic Co-operation and Development (OECD) to promote learning mathematics, Science, and the English language through the Program for International Students Assessment (PISA) (Conhecimento, 2017; OECD, 2021). The world Bank also, through its Human Capital Index, monitors and assesses countries based on their investment in education (Bank, 2021; Group, 2020). The Trends in Mathematics and Science Studies (TIMSS) is another platform that has contributed immensely to the development of mathematics education in the World and continues to make an impact.

Initiatives like the Realistic Mathematics Education (RME), which emanated from the Netherlands, have improved the learning experience of mathematics around the globe and have emphasized that learners get the required practical skills to become creative, innovative, critical thinkers, as well as problem solvers (Aksu & Colak, 2021; Barnes, 2005; Batlolona et al., 2019). The issue of Science, Technology Engineering, and Mathematics (STEM) education and the later incorporation of the Arts to become STEAM is also another such intervention that seeks to promote

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Website: https://goldenratio.id/index.php/grsse/index
ISSN [Online] 27975827

the real-life application of mathematics and its connections to the other subject areas (Belbase, 2019; Razi & Zhou, 2022; Turan, 2021). Countries like Finland, Spain, the United States, China, and Russia are serious about STEM Education (Bayles et al., 2021; Burrows, 1976; Dal, 2019; Razi & Zhou, 2022). As a sovereign country, Ghana believes that an effective mathematics education needed for sustainable development should be inquiry-based (MOE, NaCCA, 2019). This means that mathematics education must provide learners with opportunities to expand, change, enhance and modify how they view the World. The mathematics curriculum has therefore been structured to and pivoted on learner-centered teaching and learning approaches that physically engage learners cognitively in the knowledge-acquiring process (Japelj Pavesic et al., 2022; Ministry of Education, 2020).

Research has revealed that mathematics learning is an active contextualized process of constructing knowledge based on learners' experiences rather than acquiring it (Ministry of Education, 2020; Principles, 2000). The teacher, otherwise known as the coach, is a facilitator by providing the enabling environment that promotes learners' active construction of knowledge. This makes learning more relevant to the learner and leads to developing critical thinking and problem-solving skills (Ministry of Education, 2020). In the Senior High/Technical schools in Ghana, two mathematics subjects are taught thus: Mathematics (core) and Mathematics (elective). The rationale for the Ghana mathematics syllabus is focused on enabling all young Ghanaians to attain the mathematical skills, insights, attitudes, and values they will need to succeed in their daily lives and future careers (MOE, 2010). The new mathematics syllabus for Ghanaian Primary schools is based on the premise that all students can learn mathematics, and all need to learn mathematics (MOE, NaCCA, 2019). The syllabus is, therefore, designed to meet expected mathematics standards in many parts of the World. Mathematics at the Senior High school (SHS) in Ghana builds on the knowledge and competencies developed at the Junior High School level. The student is expected at the SHS level to develop the required mathematical competence to be able to use his/her knowledge in solving real-life problems and, secondly, be well equipped to enter further study and associated vocations in Mathematics, Science, commerce, industry, and a variety of other professions (Brahier et al., 2014; Ministry of Education, 2010).

The Ghana Mathematics Society, in collaboration with the Science Education Unit (National Stem Centre) of the Ghana Education Service (GES), celebrated the 2022 edition of the International Day of Mathematics on 14th March 2022 on the theme: "Mathematics Unite." The main objective of the celebration was to raise awareness among people about the importance of mathematics for the development of humanity. In commemorating the day, Basic and Second cycle students in Ghana were engaged in mathematics activities such as hands-on/practical activities, debate on mathematics-related motions, mathematics quiz competitions, and mathematics fair/durbar. As a method, it begins with the experiences expressed in lived and told stories of individuals. The current study seeks to determine the impact of the mathematics learning experiences at the Basic school on the individual's selection of program as they move up the academic ladder. This study is critical because most of the studies in the field of mathematics education focus on the individual grade levels forgetting about the progression. The Ghana mathematics syllabus also recognizes that the curriculum is a foundation for higher mathematics learning. Therefore, it is necessary to observe if the mathematics students learn at the Basic School influences their choice of academic pursuit and career as well.

Mathematics is compulsory for all programs offered at the Senior High Schools in Ghana. It also forms part of the program list for the Sciences and some other programs like the General Arts, Business and Agric Science. A close observation in the Ghanaian Senior High Schools shows that students in the sciences are not as many as contemporaries in the Arts and Humanities even though mathematics is a universal subject in Ghana from Primary One to the Senior High school final year. Nevertheless, the enrollment in the various programs, even in the Senior High Schools, depicts that some students want to run away from mathematics. If this trend is left unattended, it may reach a point that the Sciences in Ghana may not get the required number of students to run, and the consequences may be dire. Mathematics is a foundation subject for Science, Technology Engineering and Mathematics (STEM) education (Balt et al., 2022; Bermejo et al., 2021). There is, therefore, the need to take pragmatic steps to investigate the condition to put it under check. Hence, this study seeks to investigate factors that may influence one's choice to pursue the study of mathematics, specifically

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ISSN [Online] 27975827

factors in Basic school. The study sought to find out is What are the factors that help students to learn mathematics at Basic school? So that, the study will provide insight for mathematic curriculum developers to observe the kind of classroom practices that may motivate learners to persist in the study of mathematics. Secondly, it also guides mathematics teachers in identifying teaching approaches that may foster learners' acquisition of mathematical thinking skills. Third, it also guides parents and guardians on how they may support their wards to build their interest in mathematics. Fourth, the study also contributes to the literature on mathematics education.

2. Literature Review

The study stands for two theories: constructivism learning and experiential learning theory. The constructivist's learning theory is an expansion of Piaget's cognitive learning theory (Ertmer & Newby, 2013). Unlike cognitive psychology, the constructivist theory believes in learners' active construction of knowledge. As an extension of cognitivism, constructivism acknowledges the role of prior knowledge in Learning. It also endorses that individuals interpret what they experience within what they already know (Altaftazani et al., 2020; Bada & Olusegun, 2015). Constructivism as a learning theory opines that individuals create knowledge and meaning through their interactions with the World. Piaget used the concepts of assimilation, accommodation, and disequilibrium to describe how people create knowledge. In his early work as a biologist, Piaget noticed how organisms would adapt to their environment to survive. Through such adaptation, the organism achieved equilibrium. Extending these observations to cognitive Science, he posited that human beings also seek equilibrium (Gallardo-Alba et al., 2021). Constructivist theorists like Pierre Bourdieu and Lev Vygotsky argue that learners will not understand knowledge if taught as facts or pre-existing entities. Each learner creates knowledge from scratch through active participation based on prior experience. Cognition is through the acquisition and usage of knowledge. Cognitive scientists believe that the learner constructs knowledge. Therefore, Learning is unique to the individual learner since students adapt their models of understanding by reflecting on prior theories or resolving misconceptions (Atta & Brantuo, 2021; Gallardo-Alba et al., 2021). Constructivism has therefore been seen as a synthesis of multiple learning theories diffuse in one form (Ertmer & Newby, 2013). Examples of constructivist classrooms are problem-based Learning, group collaborations, research, and creative projects. There are two significant forms of constructivism that various researchers and philosophers have identified with: radical and social constructivism.

2.1. Radical Constructivism

Radical constructivism is the idea that all Learning must be constructed, and there is no utility or meaning in instruction that is teacher or textbook-driven (Gómez, 2016). Radical constructivist's view knowledge regarding the knower's experience and the World around. Radical constructivism emphasizes that even though Learning occurs in a group space, cognition is based on the individuals (Bermejo et al., 2021). It is highly recommended that individuals must be actively involved in constructing their knowledge. The individual, as they learn, may seek help from various sources to resolve any incongruencies and confusion that might have been caused by conflicting information in their mental schema. Modern scientists have observed that anytime a learner experiences new knowledge that conflicts with their previous experience, they go through a stage known as perturbation. To resolve this perturbation to reach the Equilibration stage, the learner goes through five cyclical stages known as the Five E- model (Engage - Explore – Explain – Extend – Evaluate). This is referred to as the concept change model (Bermejo et al., 2021; Dool et al., 2021; Shivoga & Nsengimana, 2021; Turan, 2021).

2.2. Social Constructivism

Social constructivists also consider how people's interactions with others impact their understanding of the World. Social constructivists recognize that different people can have different reactions and develop different understandings from the same events and circumstances and are

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ISSN [Online] 27975827

interested in how factors such as identity, family, community, and culture help shape those (Altaftazani et al., 2020; Bada & Olusegun, 2015; Ertmer & Newby, 2013). Vygotsky, for instance, believes that adults in society provide children's cognitive development in a desired and systematic way. According to Vygotsky, it is crucial that adults put the children into meaningful activities that strengthen them mentally and help them succeed. Social Constructivist Theory emphasizes that when working together, the meaning is understood better than when working alone (Pathan et al., 2018).

2.3. Zone of Proximal Development (ZPD)

ZPD is the difference between a child's development level as determined by independent problem solving and the child's potential development as determined through problem-solving under the guidance of an adult or in collaboration with a capable peer (Vygotsky, 1978). This is the gap between what the child can do on there and what a child can do with support. Individuals and groups interact to contribute to the familiar trove of information and beliefs. This helps them reach a consensus with others on what they consider the true nature of identity, knowledge, and reality (Lasmawan & Budiarta, 2020; Qiquan, 2021).

2.4. Implication for Mathematics Education

Mathematics as a science subject must be taught using hands-on and mind-on activities. It is through active student participation that will enable them to understand the concepts and be able to apply them in solving real-life problems. Teaching mathematics based on constructivist views enables the learner to take responsibility for their Learning. It also demystifies mathematics since the learner is not provided with existing facts, but they construct knowledge from scratch. The teacher in the mathematics classroom, under the lens of constructivism, is a facilitator or a coach who curates Learning. The students are at the centers of Learning and the drivers of Learning. There must be a Paradigm shift in the teacher's role from knowledge provider to learning facilitator, and the student's role shifts from information collector to the active practitioner (Borko et al., 2021). Mathematics is seen as a language on its own; therefore, learners must be allowed to express their thoughts. As observed in social constructivism, if learners could interact with others through communication, it builds their confidence to argue, explain, or make known what concepts they have assimilated. This plays a key role in mathematics education since a significant concern is building the learner to reason and communicate mathematically. Mathematics also develops leadership qualities in learners to social just freedom from oppression and democratic values like tolerance and respect for each other's views.

2.5. Experiential learning theory.

Experimental learning theory (ELT), which David Kolb originated in 1984, is a theory of Learning based on the concept of learning by doing (Asad et al., 2022). Experiential learning theory primarily focuses on the idea that there are no other better ways to learn things than having experiences. The experiences can stick out in the mind and help retain the information, thereby fostering the recall of facts (Hammad et al., 2020; Saunders & Wong, 2020). In his work which was published in 1984, David Kolb designed the four stages. The theory is derived from the works of earlier philosophers like John Dewey, Kurt Lewin, and Jean Piaget. The four stages are concrete learning, reflective observation, abstract conceptualization, and active experimentation. The stages are further grouped in two pairs; the first deal with grasping an experience, while the next two focus on transforming the experience. Kolb believed that effective Learning is achieved when the learner goes through the cycle and entering the cycle is not time-bound.

- Concrete learning: learner gets a new experience or interprets an experience in a new way.
- Reflective observation follows when the learner reflects on their experience personally. Thus, try to make meaning of what they have learned in the past.
- Abstract conceptualization: the learner forms new ideas or, better still, adjusts their thinking based on previous experience and their reflections on it.

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- Active experimentation: When the learner applies the new knowledge and skills to their daily activities, observe if there will be a need to modify some aspects.

According to Kolb's experiential Learning, the stages of learning development rest on the idea that every individual has a specific type of learning tendency.

- Diverging: learners focus on concrete learning and reflective observation. They always prefer to observe and see the situation before diving in.
- Assimilating. Learning style involves learners getting clear information. These learners prefer concepts and abstracts to people and explore using analytic models. These learners focus on abstract conceptualization and reflective observation in the experiential learning style.
- Converging: learners prefer having the opportunity to try using the acquired knowledge and skills to solve real problems. Thus, focusing on abstract conceptualization and active experimentation.
- Accommodation: learners understand better when they practice what is being taught. Experiential learning examples.

Some examples of experiential Learning used every day include practical sessions, field trips, internship opportunities, reflective reports among others (Asad et al., 2022; Jamison et al., 2022; Mardiah & Musharyanti, 2021; Meral et al., 2022).

2.6. Empirical Review

According Ten Braak et al., (2022) studies have established that children's early mathematics skills are a strong predictor of later academic achievement. Mathematics is a subject that aids the study of other subjects therefore a strong foundation in mathematics at the early grade is a higher determinant of one's academic success. The result obtained in their study revealed that first-grade executive function mediated the effects of kindergarten mathematics on fifth-grade mathematics and on reading achievement which seems to suggest that children's early mathematics skills and later mathematics is coordinated by executive function. The aim of the paper was to find out there is seemingly agreement on the fact that early grade mathematics achievement influences later academic pursuit (Ten Braak et al., 2022). A study conducted by (Lin & Powell, 2022) to find out the roles of Initial Mathematics, Reading, and Cognitive Skills in future Mathematics Performance came out that age is a significant moderator in the model, such that the mathematics achievement in children increases with age. The target of the study was to consider sets of initial mathematics skills that involve early numeracy, mathematics computation, word-problem solving, and comprehensive mathematics taught at Early Grade and their influence on future mathematics competencies of the individuals. The study posited that self-regulation's effects increased as the time lag increased which is an indication that the skills learnt help the individual to develop more skills and competencies with time.

As observed by Cattell (1963) cited in (Lin & Powell, 2022), cognitively the individual has capacitors such as the fluid intelligence, working memory, attention, and self-regulation which forms the initial cognitive predictor. Fluid intelligence, for instance, is the capacity to solve non-routine problems independent of any past knowledge. Fluid intelligence has been identified as one of the most visible literatures on cognitive predictors of mathematics achievement (Fuchs et al., 2020; Geary, 2011; Hartshorn & Boren, 1990; Lin & Powell, 2022; Namkung & Fuchs, 2016).

A meta-analysis conducted recently by Peng, et al., (2016) highlighted a bond between fluid intelligence and mathematics achievement. It was established that there is always an increase of mathematical achievement with respect to time. This is because fluid intelligence is critical needed for complex mathematical problems. Even though some researchers like (Altavilla et al., 2021; Khatib et al., 2021) believe that a set of cognitive and mathematics skills are stable across ages, it acknowledged the importance of fluid intelligence in mathematics learning.

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3. Research Method and Materials

3.1. Research Approach

The study was based on a qualitative research approach. Qualitative research is an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem. Data collection and analysis in qualitative studies do not involve numbers or calculations; only words are used to describe the phenomenon (Gani et al., 2020; Queirós et al., 2017). This study was non-experimental. (Johnson, 2001; Kothari, 2017).

3.2. Population and Sample

Since the study was on finding the influence of mathematics learning experience at the primary school on the individual's higher education, there was the need to purposefully select an individual who has specific skills to match that criteria (Etikan et al., 2016). Based on the Narrative study design, one person was interviewed to get in-depth knowledge about the topic and gather data to answer the research questions (Creswell & Clark, 2017; Crowe et al., 2011). The Respondent selected to be interviewed was the best option among the ten participants initially identified. The researcher initially identified Ten people but upon some inquiry about their educational background and carrier choice one person stood out in terms having coherent and consistent flow of mathematics in his resume. He obviously was the best choice since the main concern was to find out how mathematics learning at the Basic school play into one's choice of program and career in life.

3.3. Validity and Reliability

To ensure validity and reliability of the data, the interview conducted was entirely recorded to avoid distortions. The interview lasted for Forty-Five minutes initially, but the Respondent was later contacted for a mop-up on two occasions for short inquiries to clarify certain information. Several weeks were taken to study the tape and transcribe and analyze it. Two other researchers were contacted for their views on the data analysis before finally being recorded for the study.

3.4. Ethical Consideration

The Respondent, due to his busy schedule and the distance, agreed to grant the interview on the phone. His full consent was sought before the recording was done. The Respondent was assured that the information he discloses will be handled confidentially and will not be handed over to any third party. The Respondent was informed that there would be no financial gains in participating in the study except contribution to knowledge. The researcher also explained to the Respondent that participation in the study was primarily voluntary, and the Respondent has the right to withdraw from the study without any repercussions.

3.5. Data Collection Procedure

An interview guide was developed to guide the researcher in sequencing the questions during the interview. The guide has the first part where the researcher greets the participant, introduces himself, and seeks the Respondent's consent to conduct the interview.

4. Results and Discussion

4.1. Data Analysis

In the data analysis, the recorded tape was transcribed and grouped according to various themes satisfying the research questions.

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4.2. Analysis of Response from an Interview with A Respondent

For anonymity and confidentiality regarding research, the interviewee is referred to as "the respondent." The full consent of the Respondent was sought before the commencement of the interview process, and all doubts or concerns were addressed. The Respondent was also abreast with the objectives of the study.

4.3. Socio-Demographics

The Respondent was a male aged 45-50 years. The Respondent hailed from the Eastern region of Ghana but, due to the father's occupation as police personnel, has stayed and schooled in the Bono-Ahafo, Central, and Ashanti regions. The Respondent was married, obtained a master's degree, and currently works with the Ghana Statistical Service. The Respondent had worked with a cocoa marketing company in Ghana and as a mathematics teacher in a Senior High School.

> *"At Apedwa in the Eastern region, I began schooling, and at class two, we moved to Seikwa in the Bono-Ahafo, so I continued till class four, and my daddy was transferred again to Agona Swedurú, Central Region. I started class five until middle school Form Two and were transferred again and finally completed Form Four at Tenkorang in the Central region." (Respondent)*

4.4. Learning of Mathematics at The Basic School

When asked how he saw the Learning of Mathematics at the Basic School, the Respondent had this to say.

> *I started receiving praises from teachers for my mathematics abilities in Class Four. Then I was young, but my interest in mathematics grew by the day. I remember that in class Five, due to the lack of teachers, we were in the same class as the Class Six Pupils, but I could outperform most of the class Six pupils in mathematics. My mates and even some of the teachers called me Archimedes. I received much motivation from the teachers, and that urged me on. (Respondent)*

At the junior High school level of mathematics learning, the Respondent revealed that one teacher encouraged him because of his performance in mathematics.

> *"An encounter with one mathematics teacher at middle school form four gave me the urge to carry on. He would call me to the board to solve mathematical problems even in other classes, which greatly boosted my morale. Through the teacher, I got to learn Pythagoras theorem and other topics. He used to praise me as a good mathematics student. He shaped my mathematical ambition." That teacher motivated me a lot; sometimes, he gave me mathematics past questions to solve for him to mark. He encouraged me to work hard. I quite remember at Middle Form Three, I sat for the Common Entrance and passed, and some two Senior Secondary schools wrote to me for admission offer. However, my father did not allow me to go, and he later disclosed that he wanted me to complete Middle School before entering Secondary School". (Respondent)*

4.5. Respondent's Performance in Mathematics

> *"I was not a truant in school even though I attended different basic schools. I had a passion for mathematics but realized it in middle school from two. I stood out among my peers. I was the mathematician among my peers. Whiles someone will teach our group Geography or history, and I will be teaching mathematics during our private studies. This influenced my choice of course in form four. I offered Science so I could study Additional mathematics. After*

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ISSN [Online] 27975827

passing the common Entrance to senior secondary school, I could not perform well in mathematics in Form One for whatever reason. However, my mathematical ability took form in Form Two partly due to a lack of motivation from teachers. At the sixth Form level, I still pursued mathematics since I saw my abilities in mathematics" (Respondent)

4.6. Mathematical Strategies Adopted by Respondent's Teachers

The Respondent disclosed that the strategies adopted by teachers in teaching mathematics were a "chew and pour approach," making learners passive receivers. Unable to bring concepts and mathematical formulae to learners' level nor explain how such formulae came about, the teachers poured on learners what they were supposed to be taught. The Respondent believed that some of the mathematics teachers had strong mathematics content but lacked the pedagogical skills to teach, hence could not deliver learner-centered lessons. They were unable to bring mathematical concepts to the level of the learner nor research into mathematical concepts and generalize. It took intrinsic motivation and a passion for the subject before one could do well in mathematics.

"Not able to bring mathematics to the level of learners, teachers employed subordination of learning to teach instead of subordination of teaching to Learning where teachers pour on learners' formulae without researching how the formulae came about to explain better to learners. This developed phobia in most learners as mathematics was seen as abstract." (Respondent)

4.7. How Mathematical experience at the primary school influenced program of choice at higher Learning.

The Respondent disclosed that his mathematical experience turned out to be the "turning point" in his future career. Pursuing mathematics in higher Learning was an option and a decision he will never regret due to the numerous benefits reaped.

"The passion for mathematics drove me into pursuing mathematics at the higher levels. I saw myself as an expert and needed to complete the levels that would make me a renowned mathematician. The joy and fame I had during my national service days at a secondary school when I completed Sixth Form, and a Cocoa Buying Company always made me happy pursuing mathematics. After getting a job at the Ghana Statistical Service, I obtained a B.Ed. Mathematics as well as MPhil Mathematics Education. These were all made possible through the love and passion I developed for mathematics at the basic level". I still teach undergraduates mathematics part-time, I am a born teacher, I love teaching, and I needed to get the qualification that will enhance my pedagogical skills" (Respondent)

4.8. Mathematics as a Core Subject

The Respondent made known that mathematics being made a core subject is very important since it is an interdisciplinary subject encompassing various subjects. One's ability to gain mathematical knowledge aids in studying other subjects. Also, mathematics forms part of our daily-life activities; hence every learner must learn to solve mathematical problems so to be able to solve real-life problems. Moreover, it is a requirement for further studies and a prerequisite for employment.

"My passion for mathematics has made me who I am today, and I never regret choosing mathematics. It is important everyone study mathematics to solve daily-life problems, pursue further studies and enjoy gainful employment" (Respondent)

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4.9. Discussion

The Concept of The Narrative Paradigm

The communication theory, otherwise known as the narrative paradigm, is the study's conceptual framework. The narrative Paradigm is a concept emanating from the communication theory that Walter Fisher developed (Grimaldi et al., 2013). The framework was adopted from the oldest form of communication, storytelling. Narrations abounded in everyday life and stated that all meaningful communication is in the form of storytelling. People's past experiences influence our need for communication and base our behavior. It, therefore, positions the narrative paradigm constructively in analyzing the nature of human communication (Wolgemuth & Agosto, 2019). Humans can creatively weave discrete events and experiences into coherent wholes that have a story's features. A compelling story is believed to be more persuasive than cards of statistics, expert testimony, or logical deduction. Studies have proven that people make decisions and form beliefs based on good reasons (Hsu et al., 2022). A story has a good reason if it depends on history, culture, personal character, and biography since life is a set of Stories. Narrative theorists assert that people find stories believable when they act as we do or as we would like to see ourselves acting (Tobler et al., 2022). The narrative paradigm has been studied in rhetoric, literary theory, philosophy, history, psychology, political communication, journalism, folklore, persuasion theory, media, rhetorical, and political communication. In communication, scholars have studied the narrative's role in politics and its use in news media (Hamid et al., 2022). Researchers have come up with several ways of analyzing and understanding the stories. The specific type of qualitative design described as a narrative is recognized as a spoken or written text that gives an account of an event or a chronology of related events (Hsu et al., 2022). In the last few decades, design research has increasingly used concepts from psychology, sociology, and humanities to understand users better and create more engaging product experiences. Narratives play crucial roles in how people experience the World, making narratives the 'vehicles' we use to condense and remember experiences (Holstein et al., 2018). Narrative can organize the human memory and whole human experiences to better understand the time and time-based events. Narratives present a natural forum for people to exchange information by evoking more meaning and emotion than bare facts (Taborda-Hernández et al., 2022).

Background of the Respondent

Born at Akyem Apedwa in the Eastern Region, where my parents come from. I started school at Apedwa, staying with my grandmother until class Two, around 1968. From there, I joined my father at Seikwa up to class three until my father was transferred to Adamso, where I enrolled at Presbyterian Primary school up to Class Four. My academic prowess grew when my father was transferred to Agona Swedru in the Central Region. I enrolled in another Presbyterian school in class five until Middle School Form Two. Before I entered Form three, my father was transferred to Tenkorong, also in the Central Region. At Tenkorang, forms one and two were in the same class, while forms three and four were also in the same classroom due to a lack of teachers. At this time, I saw that I stand out among my peers so far as mathematics is concerned. I competed favorably with the four students, which motivated me to register for the Common Entrance, which I passed usefully. Even though two schools had written to offer me admission into secondary school, my father objected to it because he thought I was too young then. We formed a group of three one was good in science and the other in Geography and was good in mathematics. I remember when the three of us got distinction in our first Mock exams. I was around thirteen then, while some of my mates were 16, 17, and even 19. People were calling me distinction Boy, and I became trendy.

Secondary School Education

At secondary school, that is the Ordinary Level; we did a general about ten Subjects until after Form Three, we break into the Electives. The Electives were General Arts, Business or Science. Because of my interest in mathematics, I decided to offer Science. The science program included Physics, Chemistry, Additional Mathematics, and Biology in addition to four compulsory subjects (English, modern mathematics, one social science subject, and a science subject), making eight in all. I even added Twi to my subject lists, so I was doing Nine subjects. At Secondary Form one, my mathematics prowess was a little bit down. The topics there were complicated, even though we had

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learned similar topics before in middle school, but the concepts were complicated. I could stand out in mathematics class as before because I was scoring around 50%. I remember until the Form Two Third Term Exam that I scored 72% and that I saw there was hope. My friends commended me, and the teacher said he was impressed with my sharp improvement. It was then that my mathematics kept on improving. After completion, I found it difficult to decide whether to enroll at the training College or to do the Advance Level (A-Level). Upon consultation with my teachers and other friends, I eventually enrolled at Swedru Secondary school for the A-Level. I did Geography, Economics, and Mathematics, plus a general course there. I did not pursue Science because, at the O Level, we could not get regular teachers, so my passing in the science subjects was not good, except for mathematics.

National Service

Unfortunately, I could only do the general paper, Geography, and Mathematics. So, I decided to better my grades whiles I was doing my National Service at the Headquarters of the Mosama Disco Kristo Church school in the Central Region. I taught mathematics and economics. I was employed permeant to teach there but later had admission Legon to offer a certificate course in statistics and later a Diploma in statistics. The courses were mathematics friendly, and I enjoyed them. After completing the Diploma, I was again posted to COCOBOD in central do national service. We were to reconcile the Akuafo Check at the Bank with the farmers' records. I enjoyed my stay there for the two years, covering the one-year service and one year voluntary. I enjoyed all the allowances the staff enjoyed, and our monthly stipends were paid on time since the COCOBOD was paying.

Formal employment and Further Studies

I later moved to Assin Manso secondary school to teach Eectiv mathematics when I failed to secure a permanent job at the COCOBOD until I got an appointment at the Ghana Statistic Officer as a Senior Technical Officer. After I had worked for some time, I secured a study leave to do a Bachelor of Education Mathematics at the University of Education Winneba. Ghana statistical service is a research institution that recognizes higher certificates, so I took the advantage to do the masters in industrial mathematics at KNUST. Like the Russians and other advanced counties, they discover natural talents where you have a comparative advantage, and you must use them, so I decided to pursue mathematics at higher levels since that was where my interest was. After the Master's, I was posted to the National Headquarters of the Ghana Statistical Service, where I am now. They have established a training Centre, and I met two of my seniors who have all retired, and I have taken over as the Head of the Recruitment and Training Department.

Mathematics as a Core Subject

The knowledge of mathematics has helped me in all the jobs that I have done. Mathematics is beneficial; as a teacher in the classroom and at the COCOBOD and now as a Statistician, I apply mathematics a lot. Mathematics as a core subject in Ghana deserves it. When I was teaching mathematics at the Secondary school, I was not a professional teacher, but since I was strong in content, I could help the students to pass very well; they liked my teaching, and I enjoyed the teaching. I am a boned teacher anyway; I like teaching. I still teach undergraduate mathematics on a part-time basis.

Mathematics knowledge for teaching

On the issue of the teaching pedagogy, I later realized that the teachers, even myself, were unable to bring the concepts to the students' level because of the deficiency in the methodology. Mathematics has generally been considered complex partly because of the approach to teaching. Teachers subordinate learning to teaching instead of subordination of teaching to learning. Most of the teachers were non-professional; they just had the content but not the skills, which affected students' understanding to a greater extent. Some students have developed a phobia of the subject, and you need to repackage the mathematics instruction to suit their level of understanding. One other issue was the basics; most students then lacked a mathematics background from primary schools, which is a significant disincentive for mathematics learning in senior high school.

https://doi.org/10.52970/grsse.v3i1.230

Website: https://goldenratio.id/index.php/grsse/index ISSN [Online] 27975827

Findings

The findings of the study in response to the research questions are:

1. What are the factors that help students to learn mathematics at Basic school?
2. It is obvious from the discussion that teacher motivation and teacher pedagogical knowledge are the major factors that motivate students at the Basic school to learn mathematics.
3. Do teachers' teaching strategies have any influence on students' mathematics achievements?
4. From the narrative, the respondent mention that adopting learner centered strategies is best way to enhance student conceptual understanding "subordination of teaching to learning."
5. Does students' mathematics achievement at the Basic school impact their future academic decisions?
6. The respondent in his narrative made it clear that in all his choice of academic programs he was guided by the selection a mathematics-oriented program because he discovered his mathematics potentials at the Basic school.
7. Does the study of mathematics have a direct application in the job place?

When quizzed on the application of mathematics knowledge at the workplace, he indicated that the knowledge of mathematics is applicable at the workplace. For instance, as a mathematics teacher, you need the content at other jurisdictions the knowledge is applied. This justifies the position of mathematics as core subject in the curriculum.

5. Conclusion

It is evident from the discussion that the respondent had a solid foundation in mathematics at the Basic school and that motivated him and guided him in in his program selection as he moves up the academic ladder. It is worth noting that in all the jobs that he has done, the knowledge and application of mathematics have been instrumental. However, since the sample was only one person the study can be replicated in different forms and jurisdictions to ascertain the authenticity or otherwise of the findings in this study.

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