UNIVERSITY OF EDUCATION, WINNEBA

PERCEIVED FACTORS AFFECTING ACADEMIC PERFORMANCE OF STUDENTS IN INTEGRATED SCIENCE: A STUDY IN THE JOMORO MUNICIPALITY

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DECLARATION

Student's Declaration

I, IDDRISU MOHAMMED, declare that this thesis, with the exception of quotations and references contained in published works which have all been identified and acknowledged, is entirely my own original work, and that it has not been submitted, either in part or whole, for another degree elsewhere.

SIGNATURE: ....

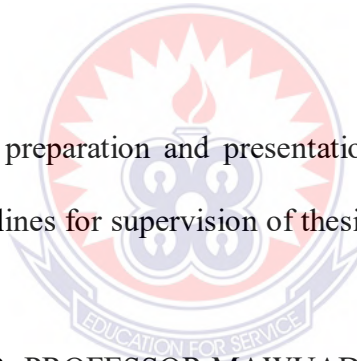DATE: ....

Supervisors' Declaration

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of thesis as laid down by the University of Education, Winneba.

NAME OF SUPERVISOR: PROFESSOR MAWUADEM KOKU AMEDEKER

SIGNATURE: ....

DATE: ....

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DEDICATION

To my parents, Mr. Doju Vuur Mohammed (late) and Mrs. Vinebeh Baboutaa Arahmata,

and to my lovely kids, Vuur Iddrisu Naagmin-maal and Vuur Iddrisu Naagminbielfu.

ACKNOWLEDGEMENTS

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ABSTRACT

The study investigated the perceived factors affecting students' academic performance in Integrated Science in the Senior High Schools in Jomoro Municipality. These factors were grouped into student's environmental factors, teacher-related factors and student-related factors. A sample of 314 respondents consisting of 294 students and 20 teachers were selected by means of stratified random sampling technique and a purposive sampling technique respectively. A descriptive survey design was adopted for the study. Structured questionnaires and semi-structured interviews were the instruments used. Data collected were analysed using frequencies and percentages with the aid of Statistical Package for Social Sciences (SPSS, 21.1 version). The findings indicated that the major factors affecting students' academic performance in Integrated Science are immediate environmental factors such as students' parental levels of education and home income, teaching and learning resources availability and accessibility, meals provision and student interrelationships in schools, teacher-related factors such as professional and subject qualifications, teaching methodology and attitude toward subject, and student-related factors such as interest, expectations and learning habits towards the subject. Consequently, it was recommended among others that enough teaching and learning resources should be provided to strengthen teachers and arouse students' interest in the subject, and in-service training for decapitated science teachers with tight supervision of teaching and learning activities of both teachers and students. Also, parents/guardians should always encourage their wards by equipping them with the necessary materials needed to study Integrated Science. The implication of the findings of the study is that these factors generally do not operate in isolation. Improving the academic performance of students in Integrated Science in schools should not involve paying attention to individual issues but should involve a total package.

CHAPTER ONE

INTRODUCTION

1.0 Overview

This chapter covers the background to the study, statement of the problem, purpose of the study, objectives of the study, research questions and significance of the study. It also includes delimitations, limitations as well as the organisation of the study.

1.1 Background to the Study

There are underlying complexity and multiplicity of factors from several studies that affect students' academic performance (Obanya, 2004; Azure, 2015; Abiodun, 2020; Omolo, Otara & Atieno, 2020). Several studies have been conducted on factors affecting the academic performance of students at different study levels in a number of institutions worldwide (Olufemi, Adediran & Oyediran, 2018). This is because the students' academic performance factor has been one of the most challenging aspects in most academic literatures since it affects their performance in all aspects of their lives (Vermunt, 2005; Azhar, Nadeen, Naz, Perveen & Sameen, 2014).

Researchers have demonstrated that the academic performance of students in science depended upon several factors including the school-based factors (the availability and use of teaching/learning resources), socio-economic factors (the education of the parents and their economic status), student factors (motivation and attitude), school type and the teachers' characteristics (Ellis, Goodyear, Calvo & Prosser, 2007; Ogunkola & Samuel, 2011; Kihwele, 2014; Edward, Ayuba & Felicia, 2017; Juan & Visser, 2017; Alshammari, Saguban, Passay-an, Altheban & Al-Shammari, 2018; Budiarti, Sari, Wiza & Putri, 2020; Parmin, Saregar, Deta & El-Islami, 2020; Winarno, Rusdiana, Riandi, Susilowati & Afifah, 2020). Unfortunately, despite the efforts of several research proposals, solutions and suggestions to draw more students to science,

especially at the second cycle levels, more students keep running away from it (Azure, 2015). The use of inappropriate teaching methods, teaching methods which are not practical enough and little effort made by some teachers to relate the concepts learnt and the examples/illustrations used to real life, especially within the context of the students' own lives and environment, contribute to the low participation and performance of students in science. (O'Connor, as cited in Azure, 2015). According to O'Connor (as cited in Azure, 2015), the most commonly used teaching methods at both basic and secondary levels have been found to be lecturing; question and answer; explanations of procedures and note giving, in that order. The author adds that little practical work is done due to shortage of equipment and consumables, and the development of a scientific way of thinking is abandoned in favour of the learning of nomenclature, definitions and stock standard procedures. This has a negative effect on students' interest and motivation to study science, mathematics and technology (SMT) subjects. The teaching and learning of Integrated Science have not always been done efficiently, especially in developing countries (Azure, 2015; Safo-Adu, Ngman-Wara & Quansah, 2018).

However, only very few of studies have investigated on perceived factors affecting the teaching and learning of Integrated Science in the Senior High Schools in Ghana. The lack of systematic research about students and teachers' perceptions regarding Integrated Science teaching and learning in Ghana, and the importance to test whether certain perceived personal and contextual varieties matter for students' academic performance in Integrated Science are the motivation for this study. There is therefore the need to investigate the perceived factors affecting Senior High School students' academic performance in Integrated Science in the Jomoro Municipality.

1.2 Statement of the Problem

There are still insufficient studies on perceived factors that affect students' academic performance in Integrated Science (Akour, Alshurideh, Al-Kurdi, Al-Ali & Salloum, 2021; Nazir, Rahaman, Chunawala, Ahmed, Alzoubi, Alshuride & Al-Hamad, 2022). There are various perceptions regarding the teaching and learning of Integrated Science in the Senior High Schools in Ghana which affect students' academic performance. Tsinidou, Gerogiannis, and Fitsili, (2010), submitted that there are many different interactions and type of links between teachers and students through courses and perceived usefulness as related to their academic performance. The factors that influence students' academic performance varies from one academic environment to another, from one set of students to the next, and one cultural setting to another (Olufemi, Adediran & Oyediran, 2018). Stakeholders in education need to understand fully the factors that affect the academic performance of students in Integrated Science more seriously because, identifying and knowing these academic performance factors guide any necessary interventional plan of action, thus, making the investigation process of these factors a topic of exceptional interest in the research of education (Al-Kurdi, Alshurideh, Nuseir, Aburayya & Salloum, 2021; Turki, Barween, Ra'ed & Salloum, 2021).

This study therefore sought to investigate the perceived factors affecting Senior High School students' academic performance in Integrated Science in the Jomoro Municipality.

1.3 Purpose of the Study

The purpose of the study was to investigate the perceived factors affecting Senior High School students' academic performance in Integrated Science.

1.4 Objectives of the Study

The objectives of this study were to;

1. examine teachers and students perceived environmental-related factors affecting the academic performance of Senior High School students in Integrated Science in the Jomoro Municipality.

2. explore teachers and students perceived teacher-related factors affecting the academic performance of Senior High School students in Integrated Science in the Jomoro Municipality.

3. assess teachers and students perceived student-related factors affecting the academic performance of Senior High School students in Integrated Science in the Jomoro Municipality.

1.5 Research Questions

The research questions of the study were:

1. What are the teachers and students perceived environmental-related factors affecting students' academic performance in Integrated Science in Senior High Schools in the Jomoro Municipality?

2. What are the teachers and students perceived teacher-related factors affecting students' academic performance in Integrated Science in Senior High Schools in the Jomoro Municipality?

3. What are the teachers and students perceived student-related factors affecting their academic performance in Integrated Science in Senior High Schools in the Jomoro Municipality?

1.6 Significance of the Study

The findings of this study will serve as a guide to various educational actors for policies and decisions regarding the teaching and learning of Integrated Science in Jomoro

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Municipality. Moreover, the study will be of immense benefit to the study schools as it would motivate and encourage Integrated Science teachers to develop better science aptitudes and rapport towards students, and that would arouse and sustain students' interest toward the subject. The study will also add more understanding to actors of education to develop necessary innovative interventions to improve upon the situation on where the need be.

1.7 Delimitations of the Study

Simon (2011) said the delimitation identifies the boundaries of the study in terms of subject, objectives, facilities, time, area and issues to which the research is focused. Participants or respondents for the study was delimited to only third-year students. The study focused on the third-year students because of their long stay in school that would have exposed them to various experiences and knowledge regarding to what they perceived to be responsible for influencing the academic performance in Integrated Science.

1.8 Limitations of the Study

Leedy, and Ormrod (2010) defined limitations as conditions beyond the control of the researcher that will place restriction in the validity of the study. The study was limited by materials and time availability Furthermore, students' maturation, intelligence, previous knowledge and socio-economic background were some of the extraneous factors that may likely impinge on the findings of the study.

1.9 Organisation of the Study

This study has been arranged into five chapters. Chapter one, the introduction is devoted to the justification of the research work. It comprises an overview, background to the study, statement of the problem, purpose of the study, objectives of the study, research questions and the significance of the study. It also includes delimitations, limitations as

well as organisation of the study. Chapter two, the literature review deals with the review of existing relevant literature on the research topic in order to justify the research objectives and identify gaps which the study attempts to fulfil. Chapter three, the methodology provides information on the research design, participants including sampling techniques, procedures, instrumentation, validity and reliability of instruments, data collection techniques, method of data analysis as well as ethical considerations. Chapter four focuses on the results and discussion of the novel findings. Chapter five focuses on the summary of findings, conclusions, recommendations, and suggestions for action and future research work.

CHAPTER TWO

LITERATURE REVIEW

2.0 Overview

According to Marshall, and Rossman (2006), a literature review refines and redefines the research questions by embedding them into a larger tradition of inquiry. It is an assessment of body of research that addresses a research question (Salleh, Mender & Grundy, 2011). As an evaluative report of information found in the literature related to the researchers' selected area of study (Gimenez & Tachizawa, 2012), its depth and breadth emphasises the credibility of the writer in the field which provides a solid background to back one's investigation. Literature review justifies how one's research fit into the existing body of knowledge, and provides general understanding which gives meaning to the discussion of findings, conclusions and recommendations (Booth, Sutton & Papaioannon, 2016).

This chapter contains the review of related literature on perceived factors affecting the academic performance of students in Integrated Science. Thus, the conceptual background of previous studies was reviewed and summarised from the view point of exhaustible studies on factors affecting students' academic performance in Integrated Science. In the interest of clarity, the review was organised under some appropriate headings. Another area covered under this chapter is the conceptual framework guiding the study.

2.1 Importance of Integrated Science

Science is described as the method of gathering knowledge through observation and recording of the knowledge gathered by using them to find answers to questions that humans ask every day (Becker & Park, 2011). Discoveries in nature are made easier through integration of ideas, thoughts and concepts. This called for the teaching and

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learning of science in the modern world to be interdisciplinary, unified, society based and aspire above all to achieve scientific literacy (Arokoyu, 2012).

Integrated Science is defined as an approach to the teaching and learning of science in which concepts and principles are presented so as to express the fundamental unity of scientific thoughts and avoid premature and undue stress on the distinctions between the various scientific fields (UNESCO-UNICEF, as cited in Arokoyu, 2012). According to D'Arbon (2002), Integration when applied to science courses, means that the course is devised and presented in such a way that students gain concept of the fundamental unity of science, the commonality of approach to problems of scientific nature and are helped to gain an understanding of the role and function of science in everyday life and the world in which they live. Brown (2007) describes Integrated Science under four broad characteristic meanings:

i. The unity of all knowledge…that integrated science has a holistic view of knowledge as essentially one and undivided;

ii. The conceptual unity of the sciences…that various conceptual units that make up the framework are identified;

iii. A unified process of scientific enquiry…this characteristic place emphasis on the methodological distinctions and similarities among the sciences;

iv. An interdisciplinary study…that the discipline is a collaborative venture between subjects and viewing of topic or theme from logically different viewpoints with the learner left to synthesise in any way he chooses.

The Integrated Science curriculum is concerned with the processes and products by which scientific knowledge is constructed and validated (Arokoyu, 2012). The author emphasised that science as a process consists of local methods of approach and the right attitudes of mind which guide inquiry into truth about natural phenomena. Scientific

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process can be approached via observation, data collection, experimentation, formulating hypothesis, stating the problem, making inferences et cetera, while scientific products are hypotheses, theories, principles and laws. These products subsequently help to discover facts about the universe.

Arokoyu (2012) highlighted five different facets of the nature of Integrated Science (process and product) as follow:

- Scientific attitude: searching for truth; science is based on evidence and empirical standards, and it also encourages innovation and scepticism.

- Scientific thinking: scientific knowledge is built on creative thinking; the application of deductive and inductive logic leads to the emergence of new scientific theories, principles, hypothesis and laws which are then tested empirically.

- Scientific knowledge: though durable also has a tentative character.

- Scientific Practice: Precise experiments, design and proper instrumentation, prudent handling of quantitative and qualitative data, honest reporting.

- Scientific Community: community with a collective wisdom, encouraging free exchange and open-minded discussions and debates.

Integrated Science offers students the benefit of learning science concepts from different science disciplines in contexts which are expected to have enduring relevance to them in future. Through systematic inquiry, students develop scientific knowledge and skills which help them to evaluate the impact of scientific and technological developments. It assists member countries in promoting scientific literacy in a unified way at the pre-tertiary levels. Succinctly, the Integrated Science curriculum has affected or impacted on science education in various ways more effective than the traditional single discipline-based approach (Bati, 2023).

As modern life requires general scientific literacy for every individual, Integrated Science is included into the school curriculum for Ghanaian citizenry, to promote national development and make the country achieves its strategic programme of scientific and technological literacy (CRDD, 2010). Arokoyu (2012) highlighted the overall aim of the Integrated Science curriculum as to:

- provide learning experiences that will enable students to develop scientific literacy so that students can participate actively in our rapidly changing knowledge-based society.

- prepare for further studies or careers in fields where the knowledge of science will be useful.

- develop interest in and maintain a sense of wonder and curiosity about the natural and technological world.

- acquire a broad and general understanding of key science ideas and explanatory framework of science and appreciate how the ideas were developed and why they are valued.

- develop the ability to think scientifically, critically and creatively and to solve problems individually or collaboratively in science related contexts.

- use the language of science to communicate ideas and views on science-related issues and make informed decisions and judgments about science related issues.

- be aware of the social, ethnical, economic, environmental and technological implications of science and develop an attitude of responsible citizenship and,

- develop conceptual tools for thinking and making scientific inquiries and sense of the world.

2.2 Academic performance factors

In all educational academic institutions, success is measured by academic performance, or how well a student meets standards set out by local government and the institution itself. Academic performance factors are those conditions such as the school and learning environment, social adjustments and individual attitude and motives that influence the academic performance of students in any educational institution (Brew, Nketiah & Koranteng, 2021). Several studies have been conducted on factors affecting the academic performance of students at different study levels because the students' academic performance factor has been one of the most challenging aspects in most academic literatures since it affects their performance in academic, social, psychological, economic and environmental cohesion (Vermunt, 2005; Azhar, Nadeen, Naz, Perveen & Sameen, 2014). The perceived factors that influence students' academic performance varies from one academic environment to another, from one set of students to the next, and one cultural setting to another.

Researchers have demonstrated that the academic performance of students in Integrated Science depended upon several factors such as parenting and home psychological climate (Campbell & Verna, 2008), learner's cognitive stimulation (Marijoribanks, 2007), school environment, facilities, nature of curriculum and the immediate society all of which determine the learner's readiness to meet his or her expectations (Omolo, Otara & Atieno, 2020), as well as under funding of education and instability of educational policy. Anamuah-Mensah (2009) has identified supervision and monitoring as well as teachers' quality and motivation (Nbina, 2012) as factors which influence students' performance. Students' interest and motivation (Edward, Ayuba & Felicia 2017; Abiodun, 2020), and students' learning approaches (Ellis, Goodyear, Calvo &

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Prosser, 2007) were also revealed to have great influence on the students' academic performance in science.

Other factors such as the role of the course experience, effort, expectations, learning strategies, attitude and interest of students towards the subject, instructional materials, and instructional strategies used by teachers also contribute to students' academic performance (Azure, 2015; Edward, Ayuba & Felicia, 2017; Safo-Adu, Ngman-Wara & Quansah, 2018; Luo, So, Wan & Li, 2021). It has also been indicated that students' performance in academics can be affected by economics factor, parents' income or social status (Azhar, Nadeen, Naz, Perveen & Sameen, 2014), student's self-respect, creativity, and conviction with academic progress (Alani & Hawas, 2021) as well as psychological factors (McKenzie & Schweitzer, 2001). According to Nbina (2012), students home upbringing to some extent is important in predicting the aspirations and success of students in schools. Also, a study by Amedeker (2020) revealed that the integration of Information and Communication Technologies (ICTs) in science instruction positively affect students' performance in science examinations in Ghana. The most significant factors with the positive outcome on the performance of the students include the environmental factors, teacher's quality and student's attitude towards learning.

2.2.1 Environment-related factors

A conducive environment is an important component in a child's proper development. The student's environment in the study includes the home, school and community. These contexts interact and have effect on students' development and learning. Omolo, Otara, and Atieno (2020) conclude that the environmental factors largely affect both the physical and psychological potentials of an individual. Home, school as well as the

community have several aspects that influence students' academic performance in many ways.

The home environment is seen as the aspects of people's domestic lives that contribute to their living conditions (Muema, Mwanza & Mulwa, 2020). Muema et al. (2020) adds that these include all the human and material resources available at the home that affects the student's education and living. Any education received by a child from parents and others at home is most likely to have highly significant and dominant effects on the behaviours of the child later in life (Adesehinwa & Aremu, 2010). The home environment is the primary socialisation agent which influences the child's interest and aspirations for the future (Nbina, 2012). Khan, Begum, and Imad (2019) state that rich and stimulating home environment is directly linked with family income, economic and educational status of the parents, nature of family, authority (head of family) and attitude of parents towards children. A study conducted by Farooq, Chaudhry, Shafiq, and Berhanu, (2011) in Pakistan revealed that higher social economic status of parents results in a higher performance of students. According to Obeta cited in Juan, and Visser (2017), inadequate provision of educational materials in Nigeria, parents' attitudes, socio-economic status of parents affected student academic performance to a very great extent, and those students who have access to educational resources at home, tend to perform better in science than those who do not (Visser, et al as cited in Juan, & Visser, 2017). Academic performance of students heavily depends upon the parental involvement in the academic activities of their wards to attain the higher level of quality in academic success (Barnard, 2004). Factors such as large family size, illiteracy on the part of the parents, poverty, parent illness, death of family member and lack of support by family members including others are factors that affect students' academic performance (Okoedion, Okolie & Udom, 2019). Students who have enough family

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support perform better academically than their mates without such support (Alfifi & Abed, 2017). And students with more educated parents from home who value science highly tend to exhibit higher academic achievement scores as such attitude is an important factor (Juan & Visser, 2017). Different home environments are created by different families that cater to their children educational inspiration and intellectual growth differently (Alani & Hawas, 2021).

School environment refers to the learning environment which includes all the facilities and infrastructure available at the place where the school is located and all that can be found within the school surroundings (Kihwele, 2014). School environment can be seen as a multidimensional construction that include the physical, social and the academic measures. The school location and its architectural design determine students' patronage and general feeling about the school (Dizaj & Khanghahi, 2021). The study adds that the physical structure of the school building can be motivating or demotivating to learners, leading to high or low patronage in the school activities respectively. Carbonaro (2005) emphasised that schools are able to influence their students' attachment and commitment in all school activities and academic performance through their facilities. Students and teachers of schools with inadequate facilities are likely to fail in perceiving a clear focus on academic purposes and the learning environment and, such is likely to influence learning processes that take place. Dizaj, and Khanghahi (2021) established that student's dormitories which replace their homes affect their emotional state when changes occur therein. This report noted that if student's preferences of school environment are ignored, dissatisfaction arose and serious emotional and psychological complications occurred as students struggle with learning, compromising and developing citizenship among different people throughout this period of learning.

School facilities according to Owoeye, and Yara (2011) were available to facilitate teaching and learning process and better students learning outcome in the Senior High Schools. It was also established that these facilities enable the student to develop problem-solving skills and scientific attitudes. It was found that students with appropriate access to pertinent instructional materials or facilities such as infrastructure in schools, dormitories, laboratories, equipped library, and classrooms among others have better opportunity to achieve academically (Ilomo & Mlavi, 2016 cited in Omolo, Otara & Atieno, 2020).

Community is a social unit with a shared socially significant characteristic such as place, set of norms, culture, religion, values or identity (Merriam-Webster dictionary.com). The general behaviour patterns, attitudes, and commitments of students are largely influenced by the community in which they are situated besides other factors (Omolo, Otara & Atieno, 2020). What goes inside the community is directly proportional to a student's overall outcome, and hence the institutional policies, practices and security are very important. Odeh, Oguche, Ivagher, and Dondo (2015) indicated that community and discipline, in general, have a significant influence on the academic achievement of secondary school students. Such seemingly less serious issues in the community were recorded to be stronger predictors of feelings of safety at school than violent crimes or personal experiences of crime (Masoumeh & Muhammad, 2016). The authors further argued that school safety and school order are fundamental to studies of the achievement gap, teacher attrition, and student engagement.

However, Gamoran as cited in Owoeye and Yara (2011) who held a contrary view noted that facilities such as books in the library and the presence of science laboratory, had little impact on the variation in students' achievement once student background variables had been taken into account. A study conducted by Mogaka (2019) on the

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availability of School Facilities and their Influence on Students' Academic Achievement in Public Day Secondary Schools in Kisii County, Kenya, also indicated that availability of school facilities alone did not influence students' academic performance.

Felder, and Brent (2005) state that students have different levels of motivations, different attitudes about teaching and learning, and different responses to specific school and classroom environments as well as different instructional practices which all influence students' academic performance.

2.2.2 Teacher quality and academic performance

Teacher quality refers to the professional practice and accountability of one's frameworks, standards and all rubrics encompassing those skills and capabilities of expertise and performance (Bradford, Pendergass & Grootenboer, 2021). Teacher effectiveness has been the interest of policy makers, educators and parents because they are the facilitators in the teaching and learning process (MolokoMphale & Mhlauli, 2014). This study adds that teachers' responsibilities include imparting knowledge, skills and attitudes and encouraging students to identify and develop their potentials as enshrined in the employment contract and explicitly defined in their job descriptions. A study conducted by Alshammari, Saguban, Passay-an, Altheban, and Al-Shammari (2018) on factors affecting the academic performance of student nurses in the Kingdom of Saudi Arabia, revealed that for the main category of factors such as the environmental related factors, teacher related factors and the student related factors, the teacher related factors impact the most.

Several studies allude to teacher-student relationship, attitude and commitment, subject matter knowledge as well as the pedagogical knowledge as the teacher related variables affecting students' academic performance. However, the teacher-student relationship,

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coordinated supervisory activities, commitment, attitude, subject matter knowledge as well as pedagogical knowledge seem to depend on the teacher's qualification, methodology and perception related to the job. The career-path projection and the foreseen progressive opportunities are highly related to motivation.

Teacher's qualification refers to the level of professional training that a teacher possesses. High quality teachers are education's best resources and assets. Students may have a better chance of understanding the subject if the teacher's qualification is intact with respect to the subject matter (Alani & Hawas, 2021). The authors added that with the qualification, the teacher has command over the subject and easily delivers the knowledge holistically for easy understanding. Quality education primarily depends on teachers and their capacity to improve the teaching and learning process. Teacher's capacity to improve teaching and learning process depends on the level of training teachers acquired which relates to the level of mastery of the subject matter and its related pedagogical skills. Thomas, and Olugbenga (2012) argue that teacher's academic qualification alone is not enough to positively affect academic performance of secondary school students but also a professional qualification in a specified field of study. A well trained and qualified teachers pass down values to inputs of students, provide constructive feedback which could help students growth, create a respectful and trusting learning environment where open authentic communication occurs, seek and encourage understanding of unity in diversity that could eventually lead to teamwork among students and demonstrate leadership and effective teaching craft that could contribute to the overall development of the students and the nation at large (Okoedion, Okolie & Udom, 2019).

A study conducted by Antony, and Elangkumaran (2020) affirms that teacher's qualification, experience and subject major are positive predictors of students'

academic performance in science. The quality of academic and professional development of teachers had during the pre-service and in-service training have great effect on their performance and on students' academic performance (Hailu & Jabessa, 2010). Teachers need to create the love and interest among students toward their subjects by their capacity through the creation and promotion of positive classroom environment and learning attitude (Jena, 2015) in order to maximise learners learning attainment. The way students perceived teachers in terms of their knowledge of the subject matter significantly affects students in their learning about that subject (Ncube, 2013). Teachers' knowledge of the science subject is an absolute requirement to create a future-oriented learning environment (Parmin, Saregar, Deta & El-Islami, 2020). This study also adds that the selection of the right teaching strategy requires knowledge of the teacher on the various strategies that must be chosen.

However, teaching approach has still been one great problem faced by most Integrated Science teachers (Winarno, Rusdiana, Riandi, Susilowati & Afifah, 2020). These authors also lamented on how most Integrated Science teachers in Indonesia still emphasise one subject instead of integrated multiple subjects. They however blamed this attitude on the fact that most of these teachers come from single-field subject departments and will need an in-service training to be able to teach the integrated curriculum, and emphasised that most problems with Integrated Science teaching and learning on the part of the teachers are unmet standards and quality of teachers. The primary purpose of teaching at any level of education is to bring a fundamental change in the learner through various teaching and learning methods (Oigara, 2011). The effectiveness of the teaching and learning process largely depends on the choice of the teacher's teaching methods. The success of science learning can be achieved through the teachers' ability to use the appropriate methods and tools to develop their work as

a result of applying the concepts (William, Brule & Kelly, 2018), hence science learning must always involve innovation. Effective teaching is a balanced blend of the pedagogical knowledge and content knowledge. Teaching and learning of science are adaptive and so constructivists approach blend with technology appears too dear as it involves more of exploration and discovery.

Teaching methods are basically categorised into teacher-centred approaches and learner-centred approaches (Oigara, 2011). While teacher-centred approaches include lecture method, drilling and questioning, learner-centred approaches include demonstrations, project-based learning, role play, and group work. Learner-centred approaches of teaching involve a state where students construct their own understanding of the content and develop a personal feeling about the learnt concepts. Learner-centred approach puts much more focus on the student's enquiry and problem-based learning thereby making students the centre point of learning. One significant of learner-centred approach is that students influence the content, activities, materials and pace of learning.

Most teachers however preferred to use traditional ways of teaching which they felt familiar with, and which do not actually facilitate proper learning of science. A study conducted by Azure (2015) on students' views on the teaching and learning of Integrated Science in some Ghanaian Senior High Schools revealed that there is a gap between actual science teaching and learning, and an ideal school science with regards to curriculum, pedagogy and learning, teacher knowledge and skills as students were not led to carry out activities suggested by the Integrated Science curriculum. Safo-Adu, Ngman-Wara, and Quansah (2018) also revealed that the quality of Integrated Science teaching and learning is affected by factors such as inappropriate and inadequate instructional materials, inappropriate instructional strategies used by

teachers, and poor teacher preparation before lessons. These reports allude poor teaching methods, inadequate instructional materials poor attitude of teachers among others as the cause of low academic performance in Integrated Science in some parts of Ghana. The benefits of the use of instructional materials and teaching methods in the teaching and learning of science cannot be overemphasised because when students are involved in science activities with the materials, they understand scientific concepts better and ultimately improve their academic performance (Quansah, Sakyi-Hagan & Essiam, 2019).

Perception is seen as the positions, attitudes, affects and behaviour that a person possesses about certain happenings, processes, situations, objects or persons (Demuth, 2016). Demuth adds that perceptions can be influenced by emotion, expectations, personal preferences, the current status and physiological processes as well as the immediate surrounding environment. In this study, beliefs are statements teachers make about their ideas, thought and knowledge that are expressed as evaluations of what should be done and is preferable (Basturkmen, Loewen & Lewis, 2004). According to Tudor, Pennington, and McDowell (2010), attitude is a reaction of one's perception of object, situation and other aspects of life. Attitudes are habitual ways of reacting to situations encountered in a certain way and can be positive, negative or neutral. Positive attitude leads to approaching and likeness while negative attitude leads to detachment and disliking (Budiarti, Sari, Wiza & Putri, 2020). Based on the opinions above, it can be seen that perception can shape the individual worldview and attitude toward science teaching and its importance, and may affect the individual's commitment to the work. Studies have indicated that teacher's attitude, action and decision determine the interest and love of students towards the subject (Jena, 2015). Teacher's beliefs affect his or her teaching practices as these beliefs may be triggered by personal factors as well as by

the professional contexts in which the teacher works. Thus, teacher's beliefs are an integral part of the teacher's classroom practice. Teachers plan, prepare, teach, evaluate, assess, attend to students' work during lessons, provide assistance, give feedback and build students' confidence (MolokoMphale & Mhlauli, 2014) and these directly or indirectly influence student's academic performance (Joseph & Green, 2019). Safo-Adu, Ngman-Wara, and Quansah (2018) established clearly that teachers' attitude toward innovation and use of instructional media affect students' academic performance.

Studies also revealed that poor working conditions, lack of time and incentives had to some great extent contributed to teachers' low morale, and hence, exerted less effort in their daily duties (Nbina, 2012; Molokophale & Mhlauli, 2014). Teacher's attitude towards the students also affects the classroom environment. How the teachers organise their classrooms, their control, manner of delivering lessons, their engagement with students leaves behind the positive or negative image on the minds of the students (Obeta, 2014). Teacher's involvement with class plays a major part in getting the message through to the students. If they were not in a good mood, then they will leave a negative impact on their learners in the classroom. In the same manner, if a teacher is highly potential, impact and begin to know how to gather his/her audience then that leaves students rooted in the topic. A teacher needs to understand these factors in order to provide a better learning environment (Obeta, 2014). According to Yang (2004), coming late to class or not showing up for it may have a negative impact on the students' academic performance. If the teacher fails to appear for classes, then the interest of the students in the subject is already lost which results in not paying attention at all. Ncube (2013) identified laziness and increased absenteeism among teachers as some attitudes which compromise quality education in Zimbabwe. This actually confirmed the World

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Bank report as cited in Asamoah, Sundeme, Quainoo, Adom-Fynn, Yally, and Afranie, (2020). The result of it all will be that the students may not like the teacher and the subject as well in the future (Yang, 2004). The study adds that although not all students react the same way, some students may still be interested in the subject due to their likeness of it but might not perform up to standards because of the irresponsibleness of the teacher.

While teachers are seen as the centre player in the academic performance of students, their morale and status are falling. The rampant strikes by teacher unions over the years as a result of low pay and poor conditions of service including the poor working environment demotivate some hardworking staff towards their job.

2.2.3 Students' related variables and academic performance

Attitude as seen as the habitual ways of reacting to situations encountered in a certain way or a reaction of one's perception of object, situation and other aspects of life (Tudor, Pennington & McDowell, 2010). Kpolovie, Joe, and Okoto (2014) asserted that student's attitude to school and their interest in learning influence their academic performance. Students' readiness, preparedness, expectations and goals are very crucial for learning to occur. Students' factors also include such as developing interest in a subject, engaging in co-curricular activities (Jayanthi, Balakrishnan, Lim & Abdul-Latif, 2014), regular studying, self-motivation, punctuality in school (Sibanda, Iwu & Benedict 2015), and student's personal goals as well as personality traits affect their academic performance. Sibanda, Iwu, and Benedict (2015) also stated that these factors related to the student self were among the highest rated factors in the success of the students because when motivated to work hard, commitment and dedication are displayed. MolokoMphale and Mhlauli (2014) state that lack of study skills and commitment to achievement on the part of students can affect academic performance.

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Student-related factors such as interest which gives effort, expectation which motivates them and learning habits and preference affect their academic performance. The importance and role an interest in whatever a person does cannot be underestimated (Adeyemo, 2005). Students' interest is their predisposition to react positively in certain way towards certain aspects of situation deemed fulfilling their personal needs and goals. Student's willingness to learn is motivated usually by the goals and aspirations set for self. This is the source of the student's intrinsic motivation and interest which hold so much power for deepening engagements and creating meaningful learnings (Abiodun, 2020). Career interest in science subjects is one of the good capitals that affect the learning outcomes in science subjects (Jufrida, Kurniawan, Astalini, Darmaji, Kurniawan & Maya, 2019).

Entwistle (2008) stated that it is not so much the teaching-learning environment provided that affects the learning approaches of individual learners, as their perception of it. As earlier stated, problems faced by teachers affect students' perceptions of Integrated Science as a subject. When Integrated Science components are taught isolated with little activities, it affects students understanding because real life situations are interdisciplinary in nature. Consequently, students find Integrated Science difficult, boring and uninteresting due to their thinking of science as abstract subject (Ogunkola & Samuel, 2011). Students' perceptions of the school climate significantly influence their academic performance as this result in a certain level of students' psychological identification with the school. Students' academic performance is influenced by the socio-cultural context and the leadership style prevalent in their schools.

Ellis, Goodyear, Calvo, and Prosser (2007) also explained that the activities undertaken by students which result in learning can be affected by pre-existing beliefs about the

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demands of the course (subject) or what students perceive it is possible to learn in a specific situation, and the immediate environment. Edward, Ayuba, and Felicia (2017) assert that if the learner is not grounded in Integrated Science at the lower basic levels, he or she will not show interest offering core science courses in future. Students' studying and learning approach play an important role in their academic performance (Mamo, Gosa & Hailu, 2017). This study also identified stress and anxiety as some major factors affecting female students' confidence and inspiration to their success. About 83.6% of 128 female students who were participants of the study in Ethiopia, revealed that their choice of learning area and interest affect their academic performance physiologically and in terms of readiness. An effective instructional leadership will build the culture of learning, provides resources needed for quality of teaching and structure the classroom environment to stimulate teachers and students' motivation (MolokoMphale & Mhlauli, 2014).

Expectation is a strong hope or belief that students have of their courses will happen (Mohammad, Peter & Lidia, 2023) and is viewed as a satisfaction model (Khan & Hemsley-Brown, 2021). Khan and Hemsley-Brown (2021) explain that satisfaction refers to the students' favourability of educational outcomes and experience based on subjective evaluation of their perceptions. Perceptions which are usually shaped by students ' expectations are important determinant of students ' attitudes or behaviour towards Integrated Science and that may have a significant impact on their academic performance.

Students' expectations influence their approach to learning of science (Mamo, Gosa & Hailu, 2017). Alfifi, and Abed (2017) state that the duration of study time influence students' expectation which affect their academic performance in schools. Cognitive load from the nature of science subject' matter as well as the way science is taught or

from the learnt beliefs make students perceived it difficult to learn (Sarabi & Abdul-Gafoor, 2018). Studies have examined the quality of course design, school type, teaching strategies, practical assessment, communication with students, respect for students, fair review, friendly attitude towards students and socioeconomic status to have significant effect on students' expectations (Khan & Hemsley-Brown, 2021; Voss, Gruber & Szmigin, 2007; Rio-Rama, de la Cruz, Álvarez-García, Mun & Durán-Sánchez, 2021; Berndt & Hollebeek, 2019), and that affect their approach toward Integrated Science, and consequently their academic performance. The career ambition which creates the expectation depends on the self and the immediate environment. Thus, student's expectation may also depend on his or her perception of science teacher, previous experience, value of science, motivation towards science, peer influence towards science, nature of classroom environment and availability of resources for science learning.

Several studies revealed that study habits are most important predictors of academic performance. Azikiwe (2007) explained that study habits are the mastery of learnable titbit outside classroom hours. Study habits also refer to how students cope with time for successful completion of an academic task within an appropriate milieu (Looyeh, Fazelpour, Chehrzad & Leili, 2007). Crow, and Crow (2002) stated that effective study habits include a plan, definite timetable and well-organised brief note taking. Study habits are the continuous practice or repetition of study skills over time. Although everybody has different study habits, the quality education of children depends on the study habits of the students (Abid, 2006). Students' approaches to learning are related to the quality of their learning outcomes (Ellis, Goodyear, Calvo & Prosser, 2007). The components or patterns of study habit central to findings includes: reading and note taking, concentration, cramming, comprehension, selection of main ideas, class-

work/assignment and guessing of examination questions. To develop good study habits, learners have to practice good study patterns. Study habit has been a staple activity of academic life and is directly proportional to students' academic performance in any course of study. Healthy study habits are seen as the regular practice of one or more study skills in achieving good academic performance. Whilst poor study habits included skipping of classes, not doing class exercises and assignments, poor study time management, and inadequate preparation before examination (Greetika & Vyas, 2017). Study habits play a vital role in reflecting the standard of education and students' academic performance. It constitutes the overall approach that represent the students' concept of how to accomplish learning goals and with what specific actions taken.

2.3 Theoretical Framework

This study advances the understanding of the perceived factors affecting academic performance of Senior High School students in Integrated Science by applying theory of self-efficacy, cognitive load theory and theory of overlapping spheres of influence as the theoretical underpinnings of the study. It should be emphasised that these theories were particularly developed to define and understand the concept of human development regarding the context of relationships that form the environment and the motivation of an individual in his or her academic life respectively.

2.3.1 Theory of Self-efficacy

Theory of self-efficacy is based on one's ability to succeed in a specific situation (Schunk & Zimmerman, 2012). The Self-efficacy, proposed by Albert Bandura, refers to an individual's belief in their capacity to perform behaviours essential to produce definite performance achievements (Gieinik et al, 2020). This theory helps reflect confidence in the ability to exert control over one's own motivation, behaviour and social environment. Self-efficacy theory is based on the assumption that psychological

procedures serve as a means of creating and strengthening expectations of personal efficacy (Bandura, 2012). The theory also helps address how people can meet their expectations within challenging conditions as it provides explicit guidelines on how to develop and enhance human effectiveness through enabling environment and motivations while overcoming any form of challenges (Abele & Spurk, 2009). The ability to remain effective under stressful conditions comes from host of factors. These factors include personal, social and situational ones which affect how efficacy-relevant experiences are interpreted (Bandura, 2012). For instance, the extent to which performance attainments alter perceived efficacy will depend on people's preconceptions of their capabilities, the perceived difficulty of the tasks, the amount of effort they expended, their physical and emotional state at the time, the amount of external aid they received and finally, the situational circumstances under which they performed (Shea & Bidjerano, 2010). Each mode of influence is associated with a particular set of factors that have diagnostic significance in the self-appraisal of personal efficacy.

In an attempt to expand the self-efficacy theory entails how people could be effective under better conditions and practices, Schunk, and Zimmerman (2012) proposed four major processes. They include cognitive, motivational, affective and selection processes. These processes usually operate in concern, rather than in isolation, in the on-going regulation of human functioning. For the purpose of this study, only cognitive process is applicable. From the cognitive process, the authors indicate that most courses of an action are initially organised in thought. This means that people's beliefs in their efficacy, shape the types of anticipatory scenarios they construct and rehearse. Therefore, those who have a high sense of efficacy visualise success scenarios that provide positive guides and supports for performance. Those who doubt their efficacy

visualise failure scenarios and dwell on the many things that can go wrong. It is difficult to achieve much while fighting self-doubt.

The origins of percepts, what influences them, where and how our perception convictions originate and the total concept of reality we live, was explained in the cognitive–psychological description of receptors and mechanisms of sensory reception by Démuth (2012). The author contends that the deeper thoughts about the conditions and mainly about the consequences of higher cognitive processes are tied to perception. The world is a sum of information and a set of various perceptions, feelings and ideas surrounding us. What we perceive are only perceptions and what we assume is behind our perception and what allegedly causes it, is just a rational construct. Besides perceptions, we possess images, rational constructs and ideas we create ourselves. In our environment and through searching for effective mechanisms of its survival, it is mainly the ability of one to identify and differentiate stimuli and equip with setup and structure which are resistant to any negative effects (Démuth, 2012). The environment directly or indirectly influences perception which affect behaviour and work. Therefore, we can assume that the more information we have and the more precise it is, the more successful we might be (provided we can use and process it correctly) in our integration with the world. Démuth (2012) states that perception enables us to discover and understand the nature and boundaries of our knowledge and thus approach it accordingly, and based on our knowledge of specific determinants and mechanisms of perception, we intervene and make corrections and consider possibilities of improving existing forms and ranges of perception through application of already existing forms of perception, which are, however, present in other places, as well as through development of completely new elements and mechanisms of perception.

Relating this explanation to this study, it stands out to reason that for one to be effective as a student and a teacher, one need to predict events and to develop ways to manage those people and things that affect their lives. This problem-solving technique requires an effective cognitive processing of information that contain numerous complexities. Some of which include attending to family needs and caring for children. If the family pressure is very high, it could influence teacher's relationships with students, as well as the perception on teaching methods in Integrated Science. In sum, teachers and students' perceptions about the teaching and learning of Integrated Science, and what goes into it could be skewed positively only if they have strong mental capacities to overcome foreseen challenges. Perceived efficacy correlates positively with academic performance among students (Niemiec & Ryan, 2009).

The theory is specifically vital in the sense that it gives a holistic view of the social system and not just an aspect of the system. This is applicable to the current study because studies with regards to Integrated Science can be effective if the people involve are confident in their ability to manage their own motivation, behaviour and social environment. With respect to this framework that seeks to explore the perceived factors affecting academic performance of Senior High School students in Integrated Science in the Jomoro Municipality, it is believed that learning outcomes are dependent on the way the teaching and learning processes are conducted and the entire environment in which learning takes place. It is therefore expected that the perceived factors affecting academic performance of Senior High School students in Integrated Science in the Jomoro Municipality would be affected by factors emanating from the school environment, teachers, students and home.

2.3.2 The Cognitive Load Theory

Cognitive load is defined as the elements that are required to be processed by the working memory at an instance in time (Kirschner, Kirschner & Paas, 2009). The working memory can only process a few new elements, and can only store them for a short period of time (Anthony & Artino, 2008; Merrienboer & Sweller, 2005; Kirschner et al., 2009). Student cognition influences their motivation (Anthony & Artino, 2008) which, in turn, influences performance. In this study it is regarded as a key element towards the student's academic achievement since it determines the success of learning. Research has indicated that learners (students) possess different cognitive styles. This requires that the teacher has to be able to develop the way in which the students cope with particular tasks or situations by using cognitive strategies (Danili & Reid, 2006). Teaching and learning are interactions between the student and the subject, facilitated by a teacher. The Cognitive Load Theory indicates the strategies available to teachers and addresses the diverse cognitive abilities of the learners. Successful learning is determined by the ability of the working memory to process new information and to store it in schemas so that more space can be made available for new information (Anthony & Artino, 2008). The Cognitive Load Theory suggests that the cognitive load should not exceed the capacity of the working memory (Anthony & Artino, 2008; Kirschner et al., 2009). It furthermore suggests ways that can be applied to control the cognitive load and the construction of schemata in learning (Kirschner et al., 2009). The Cognitive Load Theory requires that instructional material be equal to a student's cognitive resources (Cook, 2006). This means that whatever that must be taught to a student, it must be able to be accommodated in his or her working memory, which is limited, in as-much as that it can, at a later stage, be integrated into the long-term memory which is limitless and permanent (Cook, 2006; Kirschner et al., 2009). The

ability to store and organise information in the long-term memory relies on the formation of schemas (Kirschner et al., 2009). When the schemas are properly constructed then a student can master the subject. Schemas are cognitive processes of organising basic knowledge to already existing knowledge. This suggests that a student with a high level of expertise in a subject will only require a few elements to store information because most elements have already been attended to. This is different to a student with a low level of expertise because he or she will be seeing information for the first time, and will need a working memory to attend to many elements (Merrienboer & Sweller, 2005). This suggests that there should be a way to assist slow learners to reduce the load of working memory. Schemas reduce the load of the working memory because they organise information into elements, which make it easier to remember (Marzano, Gaddy & Dean, 2000). The reduction of the cognitive load of a student can result in subjects such as science and mathematics being easily grasped by students. But reduction of a student's cognitive load relies on how these science subjects are taught or how the teaching and learning material has been designed. Teaching has to be done in a manner that reduces the burden placed on the students' working memory because the working memory is increased by changing the modes of presentation (Cook, 2006).

The Cognitive Load Theory assumes that there are three types of cognitive loads, namely;

- The intrinsic cognitive load: This type of load is determined by what a student knows (expertise). It cannot be altered by how instruction takes place but rather, it depends on the number of elements to be processed at the same time, and also on how these elements interact (Merrienboer & Sweller, 2005; Anthony & Artino, 2008).

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- The extraneous cognitive load: This type of load is determined by how the task is presented to the students. It can be altered by instructional intervention (Merrienboer & Sweller, 2005; Anthony & Artino, 2008).

- The Germane cognitive load: This type of load is determined by the construction of the schema and rule automation (Kirschner et al., 2009; Anthony & Artino, 2008).

Research has identified several instructional ways to reduce the extraneous cognitive load so that the intrinsic and Germane cognitive loads increase (Kirschner et al., 2009). The instructional ways to reduce the extraneous cognitive load are the goal-free, worked examples, split attention, and the modality and redundancy effect (Kirschner et al., 2009; Anthony & Artino, 2008; Merrienboer & Sweller, 2005).

- The goal-free effect: Researchers believe that if students are given goal-specific problems they focus on the goal and do not take into consideration other information. They tend to compare the stage of knowledge that they have reached to the stage that they should reach next and this causes a high extraneous cognitive load (Kirschner et al., 2009; Anthony & Artino, 2008; Merrienboer & Sweller, 2005).

The abovementioned researchers recommend that goal-free problems should be given to the students because they drive students into focusing on the given information in order to use it where possible. This also allows them to work in a fast manner (Kirschner et al., 2009; Anthony & Artino, 2008; Merrienboer & Sweller, 2005).

- Worked examples: This effect improves the comprehension of the students, and indicates to the students the procedure they should follow to solve problems (Kirschner et al., 2009; Anthony & Artino, 2008; Merrienboer & Sweller, 2005). This effect arises because, as the students are exposed to worked

examples and their solutions, it allows them to identify types of problems, to recall the steps relevant to each type of problem, and to solve each problem without mistakes (Kirschner et al., 2009; Anthony & Artino, 2008; Merrienboer & Sweller, 2005).

- Split attention: This type of instruction gives the students different teaching and learning materials to split the attention of the student, e.g., diagrams with text that explain them, because no diagram is self-explanatory (Kirschner et al., 2009; Anthony & Artino, 2008; Merrienboer & Sweller, 2005). Diagrams coupled with text allow the student to focus on two different knowledge sources, then to integrate them; that is how learning occurs (Kirschner et al., 2009; Anthony & Artino, 2008; Merrienboer & Sweller, 2005).

- The modality effect: Instruction is done in two teaching and learning modes simultaneously, e.g., by using auditory and visual instruction. This increases the working memory, and therefore reduces the cognitive load (Kirschner et al., 2009; Anthony & Artino, 2008; Merrienboer & Sweller, 2005).

- The redundancy effect: This refers to instruction where the information is presented more than once. This reduces the cognitive load because it allows the students to concentrate on individual parts of information presented to them (Kirschner et al., 2009; Anthony & Artino, 2008; Merrienboer & Sweller, 2005).

This theory explains how students process knowledge and thus, serves as a guide for teachers. Relating this theory to the current study implies that teachers need to know how to reduce cognitive load as there are profound implications for learning outcomes. Every individual student has a limited mental storage capacity and once it has been used, the person begins to see negative cognitive load effects on memory and

comprehension. The best learning occurs when learning environment is aligned with the human cognitive capacity.

2.3.3 Theory of Overlapping Spheres of Influence

Epstein (2001) developed the theory of overlapping spheres of influence which details the interaction and communication, or collaborations, among families, schools, and the community to bring the three closers together. The theory is comprised of an external model of overlapping spheres of influence and internal model of overlapping influence. Within this theory, the family, the school, and the community are the three major contexts in which students learn and grow (Epstein, Sanders, Simon, Salinas, Jansorn & Van-Voorhis, 2002). The external model acknowledges that these major contexts "may be drawn together or push apart and there are some practices they conduct separately and some they conduct jointly to influence children's learning and development" (p. 8). The internal model "shows where and how complex and essential interpersonal relations and patterns of influence occur between individuals at home, at school, and in the community" (p. 8). This According to Epstein, students is located at the core of the model because they are the key instrumental factor in their development as well as with their school and educational success. The combination of activities conducted in all the three areas of the partnership influence the success of the student through guidance, motivation, and engagement. Reciprocally, the student is a key factor in the success of the family, school and community partnership. For instance, the main source of information parents receive about school is from the student. Academic achievement can be achieved when there is effective communication between the home, the school and the leaner (student). Teaching and learning is an interaction between a student and a curriculum facilitated by a teacher within a certain community. School-family collaboration highlights the relationships between effective parental

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involvement and improved grades for children and adolescents, greater presence in school, better behaviours, higher adolescent autonomy, and higher academic aspirations (Sanders, 2001). Numerous research findings consider parental involvement in a child's learning as a factor in a student's academic achievement (Makgato & Mji, 2006; Lemmer, 2007). As for "school-community collaboration," Programs most often mentioned include supporting students with scholarships or other forms of encouragement, tutoring, mentoring, and various activities related to the student's career plans (Sanders, 2001).

 In this research, the Theory of Overlapping Spheres of Influence (Figure 1) is used to describe how family, school and community collaboration can be made effective in order to foster parental involvement. The school is not an entity on its own; it has to share the same goals in respect of education with the community so that everyone in the community (the parents and the students) can adopt school policies and programs and ensure that all school programs are implemented successfully, even though goals can be shared, the reality of the matter is that the school and the community have independent practices and models in respect of learning (Epstein, 2001). This Theory separates the family, the school and the community into three spheres which can be integrated, and which have student's education as a mutual interest (Lemmer, 2007).
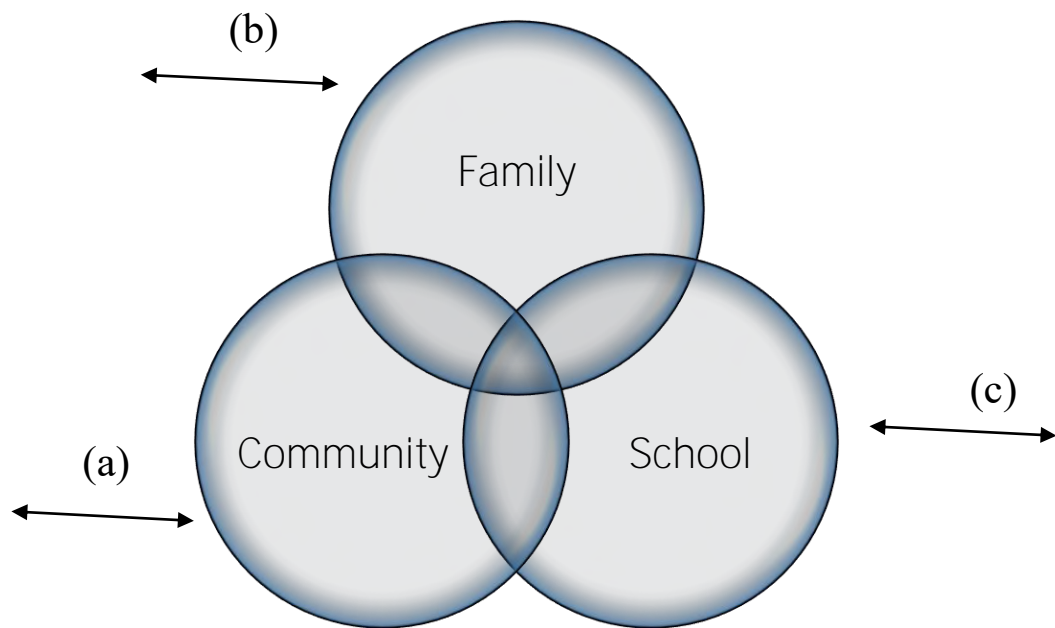
Figure 1: The Theory of the Overlapping Spheres of Influence

Sources: Epstein, Sanders, Simon, Salinas, Jansorn, and Van Voorhis (2002)

From Figure 1, (a), (b) and (c) are the three forces that can either push the spheres together or pull them apart (Epstein et al., 2002). They are (a) time; (b) characteristics, philosophies and practices of the family; and (c) characteristics, philosophies and practices of the school (Epstein et al., 2002). The Theory of the Overlapping Spheres of Influence, based on the sharing of educational goals amongst the family, the school and the community, can be applied to achieve effective communication amongst all parties involved in teaching and learning. The Theory outlines six activities which are involved in creating a partnership between the school and the community. These activities include parenting, communication, volunteering, learning at home, decision-making and collaborating with the community (Epstein, 2001). There are three forces that determine successful implementation of this theory namely force (a), (b) and (c) shown in figure 1 (Epstein et al., 2002). According to research, the three forces that

have been hindering an effective partnership between the school and the community are the following:

- Force (a), time: Most parents work long hours and are not able to support their children in respect of their schoolwork or to attend meetings, because they leave early for work and come back late and tired (Modisaotsile, 2012; Makgato & Mji, 2006).

- Force (b), characteristics, philosophies and practices of the family: Where most parents are characterized as uneducated, not familiar with the current syllabus and not proficient with the medium of instruction (Kgaffe, 2001; Makgato & Mji, 2006). Hence, they cannot contribute effectively towards their children's education. They therefore distance themselves from participating, as they regard themselves as lacking in efficacy (Makgato & Mji, 2006).

- Force (c), characteristics, philosophies and practices of the school: The schools only reduce parental involvement to support roles and volunteering and this leads to the parents losing interest in participating in the schools' activities (Kgaffe, 2001).

Where they are involved in educational roles, there are challenges, such as the lack of school policy on parental involvement (Kgaffe, 2001) and the lack of training on how the educators should involve the parents in the schools (Lemmer, 2007). The success of implementing this theory lies in the educators applying a new thinking approach about communication, connections and coordinated actions to be conducted with the families and the community partners of the school to help the students succeed to their full potential (Epstein & Sheldon, 2006). Effective parental involvement means that the parents will be directly involved in their children's learning, and that the community will also ensure that the school runs

smoothly with minimal hindrances. In that way the school will only carry the burden of teaching, and everything else, such as student's social problems will have been taken care of by the community.

2.4 Conceptual Framework
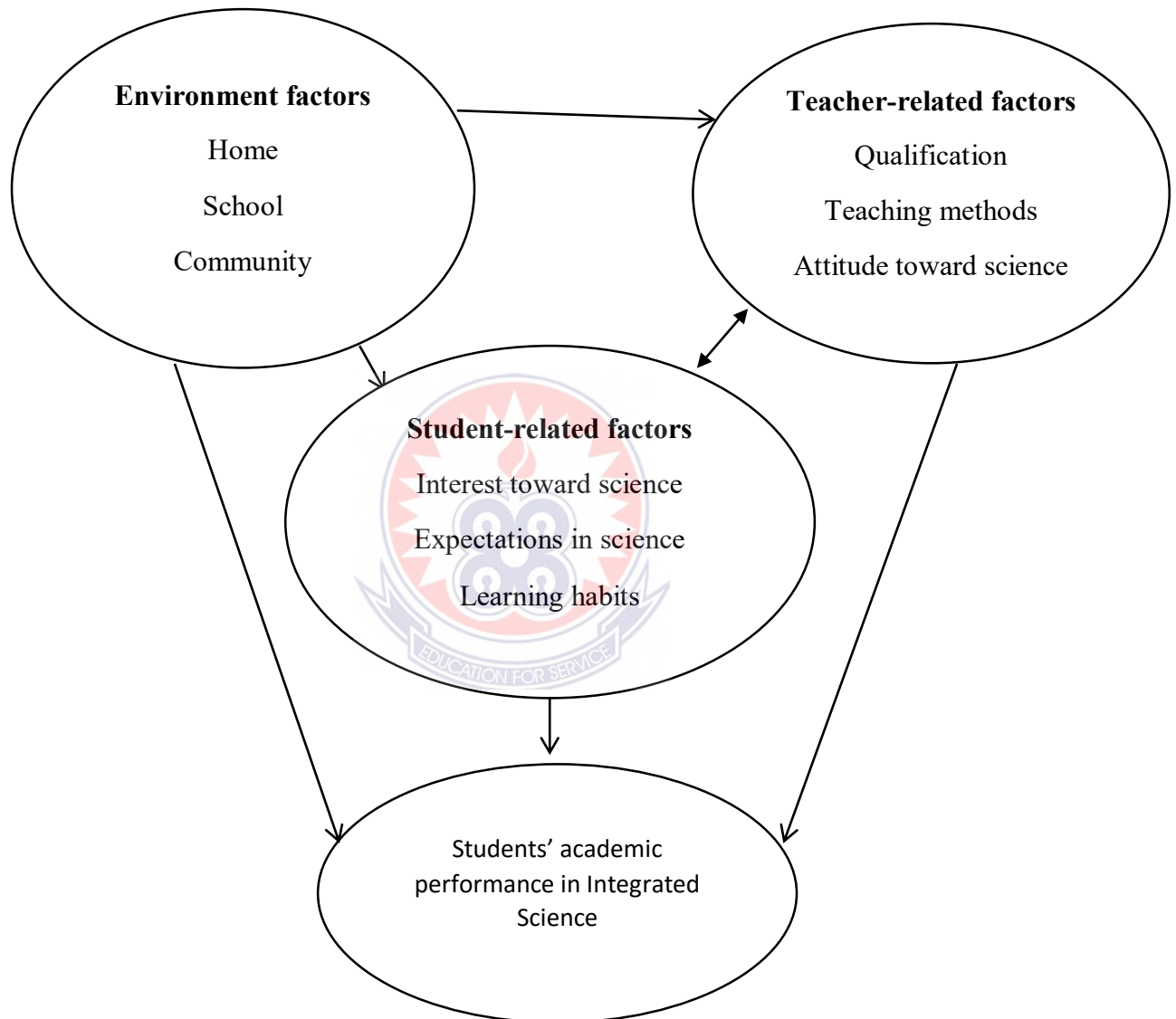
Figure 2: The conceptual framework of the study

Source: Field work, 2023

Based on the literature review in the study, a conceptual framework (Figure 2) was developed to establish the expected relationship between the independent variables and the dependent variable of the study. The dependent variable is the students' academic

performance in Integrated Science whereas the independent variables are the environmental factors, teacher-related factors and students-related factors which have been supported by theoretical argument that such factors have some relationship with the students' academic performance in Integrated Science. The arrows on the Figure 2 depict the flow and influence of one variable on another with specific relations to the research objectives guiding the study. In Figure 2, the environmental factors compounded both teacher-related factors and the student-related factors while student-related factors and the teacher-related factors influence one another, and all these factors have a direct consequence on students' academic performance in Integrated Science. Hence, students' academic performance in Integrated Science is influenced by their exposure to immediate environment factors, teachers' factors and student factors (Figure 2). The conceptual framework of the study identified the variables required in the research investigation. It thus serves as the research "map" in pursuing this research investigation which sought to explore the perceived factors affecting academic performance of students in Integrated Science in the Jomoro Municipality. Hence, this framework provides a ground for the findings from the study to be identified.

2.5 Synthesis and Gaps in the Literature

Gaps in the literature are missing pieces or insufficient information in the research literature that are areas that have scope for further research because they are unexplored, under-explored, or outdated. The analysis highlighted the existence of gaps in the literature including studies from limited geographical areas, that focus on either environmental factor, teacher factor or student factor affecting students' academic performance in Integrated Science, and lack of studies that explore these kinds of factors all together in the rural areas. In creating the existing literature on perceived factors affecting students' academic performance in Integrated Science education, one

thing becomes clear that, it is impossible to effectively learn Integrated Science without understanding the various perceptions students and teachers conceived regarding Integrated Science learning especially at the second cycle institutions in the rural areas. Teachers and students' perceived factors are an important determinant of their behaviour towards teaching and learning of Integrated Science, and understanding these factors can be more useful in explaining their behaviour than well-intentioned inferences. Stakeholders in education need to understand these factors more accurately from the 'horse's mouth' because factors that affecting academic performance may vary from one geographical location to another. Overall, the outcomes of the review show that when students perceived factors are well understood, conducive learning environment as well as quality teachers with appropriate teaching methods as intervention easily can be used to improve upon students' academic performance in Integrated Science at the Senior High School levels. Also, it must be emphasised that academic performance factors generally do not operate in isolation.

Most studies on the perceived factors affecting students' academic performance in Integrated Science were conducted in different environment than the environment of the present study. There is therefore a gap in literature on the perceived factors affecting academic performance of senior high school students in Integrated Science particularly in the Jomoro Municipality of the western region of Ghana. Hence, the need to identify the perceived factors affecting students' academic performance in Integrated Science in the Senior High School in the Jomoro Municipality.

2.6 Chapter Summary

This chapter included an exhaustive but incisive review of relevant literature in the research study. The researcher's review exercise was geared towards justifying the defined objectives of the research and establishing the premise for the research work.

The chapter also identified gap in the literature in which the study attempts to fulfil, generate and contribute to knowledge.

CHAPTER THREE

METHODOLOGY

3.0 Overview

This chapter focused on how the study was carried out. It presented the research design, study population, sampling techniques and sample size, data collection instruments, validity and reliability of research instruments, data collection procedure and data analysis as well as the ethical considerations.

3.1 Research design

Research design is seen as the overall blueprint of research methods and techniques chosen to integrate the different components of a study in a coherent and logical way (Labaree, 2013 as cited in Cohen, Manion & Morison, 2018). Inaam (2016) defines a research design as the conceptual blueprint within which a research is undertaken. It spelts out the sequence which connects the data to the research questions and its conclusions (Yin, 2009), and ensures the evidence is linked to the research questions and conclusions with a clear logic connecting the data to the evidence. According to Cohen, Manion, and Morison (2018), a conclusion from a research study need not only the evidence but also a logical warrant that renders the evidence a fair defence of the conclusion. The authors stated that this "blueprint" is governed by "fitness for purpose" for a particular study (p. 173). Generally, a research design is conceptualised as the blueprint which serves as a bridge between the research questions and the implementation of the research. Some research designs include; action research design, survey research design, case study research design, experimental Research design et cetera.

In this study, the research design adopted was descriptive survey research design. This is because the study sought to objectively explore the perceived factors affecting

students' academic performance in Integrated Science and accurately describe the phenomenon in its natural situation by engaging the study subjects (students and teachers in the two senior high schools) who are the centre of the research objectives, and sought to gain knowledge about the phenomenon, as well as to generate new knowledge from the topic. Descriptive survey research design objectively allows for the accurate description of activities, processes, objects or persons (Asamoah, Sundeme, Quainoo, Adom-Fynn, Yally & Afranie, 2020). Descriptive survey research design is a design that gather data from sample of population with the intention of describing the nature of existing conditions between specific events or variables (Cohen, Manion & Morison, 2018). According to Collis, and Hussey (2013), descriptive survey design is an efficient manner of gathering information about a large population. A descriptive research approach attempts to systematically describe and interpret characteristics of a population or phenomenon being studied (Bryman, 2012). The purpose of descriptive survey is to observe, describe and document aspects of a situation as it naturally occurs (Amedahe, 2002). It also enables gaining of insights into the study population and the variables studied (Hair, Black, Babin & Anderson, 2010). Quantitative approach involves the process of employing an objective measure to a numerical data with the view of demonstrating the relationships that exist between variables (Creswell & Creswell, 2018). Qualitative approach gathers data by using fewer specific questions which probe for deeper understanding of a certain phenomenon. The use of multiple approaches, both quantitative and qualitative in a study secures complete and accurate understanding of the phenomenon in question because they add vigour, breadth and depth to the investigation and provide a stronger understanding of the problem or the question (Creswell & Creswell, 2018). In this study, the adopted descriptive survey research design used quantitative and qualitative

approaches in which multiple sources of evidence from quantitative and qualitative data collection and analysis are integrated in the single study, providing the researcher with more complete and accurate information. It is economical and efficient as data can be gathered on a one-shot basis, but still represents a wide target population as well as provides descriptive, inferential and explanatory information. The study gathered both quantitative and qualitative data with the intention of generating more complete and accurate information for describing the nature of existing relationships between perceived factors affecting the academic performance of students in Integrated Science. This is relevant for this study because it enables the researcher to have a comprehensive insight and obtain more holistic evidence for the research.

The research philosophy employed can be generally classified as Pragmatism, a philosophy that suggests that it is worthwhile not to commit to any one system of reality but to a pluralistic approach to drive knowledge about a problem for holistic comprehension. It is a line of thought that centres on using different methods, assumptions as well as different forms of data collection and analysis. The study is looking at the situations through the perceptions of the participants and this enables multiple and varying perspectives to be assessed. This is why the researcher adopted the pragmatic paradigm in examining the perceived factors affecting academic performance of students in Integrated Science. One advantage of this philosophy is that the diverse types of data best provide a more complete understanding of the research problem than either the quantitative or qualitative data alone (Creswell & Creswell, 2018).

3.2 Study Area

The study was conducted at the two public Senior High Schools in the Jomoro Municipality in the western region of Ghana. The two public Senior High Schools, Half

Assini Senior High School and Annor Adjei Senior High School are the only second cycle institutions in the Municipality.

The schools offer programmes such as General Arts, Visual Arts, General Science, Agricultural Science, Business and Home Economics.

3.3 Study Population

Defining the population is very important as it constitutes a major part of the research design process (Ngulube, 2005). According to Singleton and Straits (2010), population refers to the entity or unit of analysis which is being studied. A study population comprises of persons, families, or entities with related traits about which a researcher wants to make conclusions (Cooper & Schindler, 2014). It is the population to which a researcher wishes to generalise the results of their study (Mugenda & Mugenda 2012). Population is divided into two aspects, Target and accessible population.

Alvi (2016) also defines target population as all the members who meet the particular criterion specified for a research investigation. In this study, the target population was all senior high students in the two public Senior High Schools in the Jomoro Municipality. The target population for the study comprised of 2,548 second and third-year public Senior High School students and 40 Integrated Science teachers as at February 2022 in the Jomoro Municipality.

The accessible population is the population from which the researcher can realistically select subjects, which is also known as the available population (Gay, Mills & Airasian, 2012). The accessible population is the subset of the target population, also known as the study population. The accessible population for this study was all third-year students in the two public Senior High School in the Jomoro Municipality. The accessible population was made up of 1,245 third-year students, (617 girls and 628 boys) and 18 Integrated Science teachers.

3.4 Sample and Sampling Techniques

Factors such as expense, time, accessibility frequently prevent researchers from gaining information from the whole population. Therefore, researchers often need to be able to obtain data from a smaller group or subset of the total population in such a way that the knowledge gained is representative of the total population under study. This makes sample and sampling techniques necessary. Singleton, and Strait (2010) defined sample as the selected elements (objects or people) chosen for a study. Ary, Jacobs, and Sorensen (2010) also defined a sample as a portion of a population, or a group selected from a population for observation in a study. According to Cohen, Manion, and Morrison (2018), sample denotes a carefully selected subset of the total population in such a way that knowledge gained is representative of the study population. The authors add that sampling must abide by ethical principles and be practicable and efficient. The number of members of a given population which is selected to represent the entire population with similar traits defined the sample size.

According to Sturner (2020), sampling is the process of selecting a subset with sufficient representation of the total population of interest in a research study. Sampling also denotes the method of choosing a number of people to participate in a study from a larger group of people (Saunders, Lewis & Thornhill, 2012). Sampling assists in generating a sampling frame which constitutes the items from which a sample is actually selected (Cooper & Schindler, 2014), and thus a crucial element of research. There are two main methods of sampling which are probability sampling and non-probability sampling (Cohen, Manion & Morrison, 2018). There are several types of probability sampling: simple random sampling; systematic sampling; stratified sampling; cluster sampling; stage sampling, and multi-phase sampling. Just like the probability sampling, there are also several types of non-probability sampling:

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convenience sampling, quota sampling, dimensional sampling, purposive sampling and snowball sampling (Cohen, Manion & Morrison, 2018).

In order to select the accessible population, the appropriate sampling technique was purposive sampling. The accessible population of 1,245 third-year students and 18 Integrated Science teachers were selected. Purposive sampling is a nonprobability sampling technique wherein there is a zero chance of selecting certain units of the study population since it offers no basis for evaluating the probability of including every element within the population in the sample (Anol, 2012; Kothari, 2004). Tashakkori, and Teddlie (2003, p. 713) define purposive sampling techniques as a sampling technique whereby respondents are selected "based on a specific purpose rather than randomly". This sampling technique was adopted because the researcher intended to carefully obtain study subjects who are more likely to have rich experience, show readiness, and very inquisitive about the study objectives that the researcher seeks to explore. The third-year students were used for this study because, their long stay in school would have exposed them to various experiences through relations and interactions, and knowledge regarding what they perceived to be responsible for affecting their academic performance in Integrated Science. Equally, 18 Integrated Science teachers with at least five years of teaching experience in the two public Senior High Schools were purposively selected. Purposeful sampling techniques provided the opportunity for the researcher to deliberately select the subjects of the study who would aid in providing accurate and relevant data (Sarantakos, 2005).

However, in this study random stratified sampling technique was adopted for the selection of a sample size of 294 third-year students from the accessible population. Random stratified sampling involved dividing the student population into two homogeneous groups (male and female), and then randomly sampling within the groups

(Cohen, Manion & Morrison, 2018). The researcher intended to determine sample which accurately represent the population proportions (or percentages) at a specific probability and with a certain level of accuracy. Random stratified sampling technique does not only ensure the complete and balanced representation of the population composed of males and females, but also a useful blend of randomisation and categorisation which overcome individual differences and guarantee sufficient validity for generalisability as it avoids selection bias (Cohen, Manion & Morison, 2018). In stratified random sampling technique, "every member of the wider population has an equal chance of being included in the sample, and inclusion or exclusion from the sample is a matter of chance and nothing else" (Cohen, Manion & Morison, 2018, p. 214).

The researcher used the random stratified sampling with some criteria that are relevant to sampling and sample size such as confident level, confidence interval, population size and the table of chi-square for one degree of freedom at the desired confident level. The confidence level, usually expressed as a percentage is an index of how sure the researcher can be of the data obtained from sample that the responses lie within a given variation range (Cohen, Manion & Morrison, 2018). Also, it represents how often the percentage who would pick an answer lies within the confident interval. The confidence interval is that degree of variation or variation range that the researcher wishes to ensure (Cohen, Manion & Morrison, 2018). The authors further stated that confidence interval is affected by sample size, population size and the percentage of the sample giving the 'true' answer (p. 205). The confident interval tells us how confident the researcher can be that the results from the study reflect what the researcher would expect to find if it were possible to survey the entire population being studied.

A confidence level of 95 per cent and confident interval of ±5 per cent were adopted for this study. This is because, 95 % of the time, the confidence intervals of ±5 per cent will contain the population parameter as the representative sample that would produce a more certainly accurate results that can be extended to the study population which is core in this study.

One widely used and cited method of determining sample size is the Krejcie and Morgan formula, or the use of tables derived from the formula (Krejcie & Morgan, 1970 as cited in Cohen, Manion & Morrison, 2018). This was clearly indicated by the actual Krejcie and Morgan formula (Krejcie & Morgan. 1970, p. 607 as cited in Johnson & Shoulders, 2019) as;

$$n = \frac{(\chi 2)(N)(P)(1-P)}{[(d^2)(N-1)+(\chi^2)(P)(1-P)]}$$

where

n = the required sample size

$\chi 2$ = table value of chi square for one degree of freedom at desired confidence level (95%) is 1.96 x 1.96 = 3.841

N = the student's population size which is 1,245.

P = the population proportion is the proportion of individuals in a population sharing a certain trait, male and female (is 0.50 to maximize sample size)

d = the level of accuracy of the estimate expressed as a proportion. The researcher wants the results to be accurate within five percent points (0.05).

This is because the Krejcie and Morgan formula was intended to calculate the sample size, n, necessary to construct a confidence interval (±5%) around the sample percentage that will, in 95% (confidence level) of all samples equal to n, contain the true population percentage. Thus, the use of Krejcie and Morgan to determine sample

size is appropriate as the objective was to estimate population percentages from sample percentages and ensure representativeness of the wider population.

$$n = \frac{(3.841)(1,245)(0.50)(1-0.50)}{[(0.05^2)(1,245-1)+(3.841)(0.50)(1-0.50)]} = 294$$

The application of the Krejcie and Morgan sample size formula in this study resulted in a required sample size (n) of 294. The student participants then were selected randomly from the strata of males and females until a limited number from within each of the sub-groups, 294 was reached as determined by the Krejcie and Morgan's formula, specifying a five percent margin of error. According to Neuman (2009) the motivations for using probability or random sampling by researchers include time and cost effectiveness, and accuracy of the findings. Neuman stated that "the results of a well-designed, carefully executed probability sampling will produce results that are equally if not more accurate than trying to reach every single person in the whole population" (p. 195). The random stratified sampling technique ensures complete and balanced representation of the wider population composed of boys and girls in the two Senior High Schools in the Jomoro Municipality who took part in Integrated Science lessons. Also, the 20 teachers included the two assistant headmasters for academic from the two Senior High Schools were purposively selected to participate in the student since the study bother around students' academic performance in Integrated Science. Therefore, the total sample size of 314 students and teachers were selected for the study.

3.5 Instrumentation

Instrumentation is seen as the tools or means by which the researcher attempts to measure variables of interest in the data collection process (Hsu & Sandford, 2012). The authors add that instrumentation is related not only to instrument design, selection, construction and assessment, but also to the conditions under which the designated instruments are administered. Instrumentation is also seen as the heart of research, with

almost all empirical research being heavily dependent upon this aspect (Goldstein, 2012) because the appropriate measurement of variables of a phenomenon required great effort from the researcher's instrumentation. Hence, extra care is paramount to researchers' effort, conceptualisation, generation of items and considerations in terms of sequences of items and suitability of words and length, especially during the process of instrument development (Khairuddin, Omar & Ismail, 2018). It helps to keep track of what is being observed and how to report for data collection.

Research instruments are measurement tools designed to obtain data on a topic of interest from the research subjects (Denzin & Lincoln, 2001). Some research instruments used in research include observation, interviews, questionnaires, tests, checklists, tally sheets, flow charts among others.

In this study, structured questionnaire and semi-structured interview were the instruments used for the data collection. Questionnaires are defined as any text-based instrument that give survey participants a series of questions or statements to respond to either by indicating a response, marking a page, writing a number or checking a box on a paper or online (Brown, 2001). The use of the questionnaire was appropriate because the study focus on exploring the perceived factors affecting academic performance of students in Integrated Science.

The researcher developed structured survey questionnaires in line with the literature and objectives of the study in order to gather the most accurate quantitative data for the study. The questionnaire items were particularly developed for Senior High School students and teachers who teach Integrated Science respectively to elicit responses on the perceived factors affecting academic performance of Senior High School students in Integrated Science in the Jomoro Municipality. The questionnaires were organised into four sections, namely, Section A, B, C and D. Section A focused on the

demographic data of the respondents whereas Sections B, C and D collected data on the three key study variables, namely, environmental factors, teacher-related factors and student-related factors respectively.

The study used Likert Scale to measure the questions on the questionnaires. Likert Scales are very attractive, reliable and widely used tool for measuring respondents' attitudes, opinions and beliefs (Yates, 2004; Cohen, Manion & Morrison, 2018). All the items in the various sections were measured on a five-point Likert scale; 1= Strongly Disagree (SD), 2= Disagree (D), 3= No Opinion (NO), 4= Agree (A) and 5= Strongly Agree (SA) with '1' indicating the least agreement to the issues while '5' representing the strongest agreement to the items. Questionnaires with the Likert Scale were built in a degree of sensitivity and differentiation of response while still generating numbers. Such data can be analysed more scientifically and objectively than other forms of data. It's a relatively inexpensive, quick, and efficient way of collecting large amount of data even when the researcher is not present to collect those responses at first hand.

Despite the fact that questionnaires are easy to administer, friendly to complete, simple to compile and fast to score and therefore take relatively less time from the researcher and the respondents, dishonesty can be an issue. Thus, respondents may not be 100 percent truthful with their answers. This can happen for variety of reasons, including social desirability bias and attempting to protect privacy. However, the researcher stopped dishonesty in its track by assuring respondents and demonstrating that their privacy is valued and that the process prevents personal identification. It also has a weakness of respondents skipping questions which are complicated, and this can affect the result of the study; notwithstanding, the researcher made the questions uncomplicated to avoid questions skipping so that the researcher gets better completion

rates. The researcher used simple English language and clearly straight questions for easy comprehension and also for the avoidance of confusion and misleading.

Interview is an interaction between two or more people for purposes of exchanging information through a series of questions and answers (Bryman, 2012). Interview uses oral method to collect data and as such has power to use probes to allow the interviewer to get more in-depth information than any other instrument such as questionnaire. The best method to complement questionnaires to seek and collect accurate data for thick description on any phenomenon is the interview because it has the power to elicit the responses by the probe questions (Patton, 2004). Ashworth, and Lucas (2000) noted that in undertaking a phenomenographic interviews, the researcher should focus only on the participants point of views and their unique lived experiences. If this does not occur, the description of the participants experiences and the overall outcomes of the study will be unsound. The goal of the interview in this study was to explore the perceived factors affecting the academic performance of students in Integrated Science in each participant's experience of evidenced-based practice.

Semi-structured interview was used for this study because it made it easier to probe and replicate the responses provided in the questionnaires on the topic and to simplify the findings. The researcher prepared an interview guide based on the research objectives to collect data from the two heads of science department and the two assistant headmasters of academics. An interview guide is a document (instrument) that enables the researcher to structure the way the interview was conducted. It involves translating the research objectives into a list of questions that make up the main body of the study (Cohen, Manion & Morrison, 2018). The semi-structured interview guide was used to collect the qualitative data from four selected most experienced teachers (two HODs and two assistant headmasters of academics) of the two senior high schools in the

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Jomoro Municipality. Interview guide helps the researcher to keep focus on the high level of topics to be covered in the interview with high level questions that need to be answered under each topic. The researcher limited the guide to only one page for easy reference, focus and smooth organisation of the line of thinking and questioning. The semi-structured interviews were recorded to keep data more reliable.

Focus groups are contrived settings, bringing together a specifically chosen sector of the population to discuss a particular given theme or topic, where the interaction with the group leads to data and outcomes. It is another nature of the interview that was used to collect data for the study by engaging selected students who come to discuss the topic under investigation. The questions' themes composed for the interview were used for the focused group discussion. These open-ended questions were used to stimulate discussion for data to be collected from purposefully selected students on the perceived factors affecting academic performance in Integrated Science. Their contrived nature is both their strength and their weakness: they are unnatural settings yet they are very focused on a particular issue and, therefore, will yield insights that might not otherwise have been available in a straightforward interview; they are economical on time, producing a large amount of data in a short period of time, but they tend to produce less data than interviews with the same number of individuals on a one-to-one basis (Cohen, Manion & Morrison, 2018). Focus groups might be useful to triangulate with more traditional forms of interviewing, and questionnaire. Focus groups are not without their drawbacks. Group dynamics may lead to non-participation by some members and dominance by others and the number of topics to be covered may be limited; intragroup disagreement and even conflicts may arise; inarticulate members may be denied a voice; the data may lack overall reliability. If student focused group discussion is not

well controlled, it may result to a chaos and lost direction in the discussion. Focus groups require skilful facilitation and management by the researcher.

The recorded interviews were transcribed during the analysis of the results. This data then was used to complement and illuminates the questionnaires' data on the perceived factors affecting students' academic performance in Integrated Science and provided more in-depth analysis of the study's variables for more coherent discussion and conclusions.

3.6 Triangulation

According to Cohen, Manion, and Morrison (2018), triangulation is a technique of physical measurement used in an attempt to map out or explain more fully the richness and complexity of human behaviour by studying it from more than one standpoint, making use of both quantitative and qualitative data. The authors add that triangulation techniques are powerful ways of demonstrating concurrent validity in a research study and are suitable when a more holistic view of educational outcomes is sought, or where a complex phenomenon requires elucidation.

In this study, the instrument triangulation is the convergent parallel administration of the structured questionnaire and semi-structured interview guide about the same phenomena. A convergent parallel design entails that the researcher concurrently conducts the quantitative and qualitative elements in the same phase of the research process, weighs the methods equally, analyses the two components independently, and interprets the results together (Creswell & Pablo-Clark, 2011). Quantitative data for the study was collected through the use of structured questionnaires whereas the qualitative data were collected through a semi-structured interview guide. The convergent parallel mixed method of data collection was employed to provide corroboration and triangulation and to ensure that reliable inferences are derived from reliable data. This

is because the researcher wants to triangulate the data in order to generate reliable evidence and get full rich description of the phenomenon in question.

The essence of triangulation in this study was also to seek convergence of results for validity and reliability of both strategies. Its aims are achieved when both quantitative and qualitative data which were collected independently and in parallel with each other converged, yielding triangulation of data and offering complementary data on the question or topic in question. In this study mixing occurs during the discussion of results (Creswell & Creswell, 2018). The data were then integrated to provide a comprehensive understanding of the problem at hand.

Paradigmatic roots that underpin quantitative and qualitative research is an important approach which yields real answers to real questions; useful in the real world; avoids mistaken allegiance to either quantitative or qualitative approaches on their own; enables rich data to be gathered which address the triangulation that has been advocated in research for many years; and increases validity and reliability in the study (Cohen, Manion & Morison, 2018).

Most quantitative data gathering techniques condense data in order to see the bigger picture. Qualitative data-gathering techniques, by contrast are best understood as data enhancers, because when data is enhanced, one can see key aspects of evidence more clearly. Both data then may complement each other and provide a solid foundation for more accurate analysis of the study's variables for more coherent discussion and conclusions.

3.7 Validity of the Instruments

Validity is the extent to which the instruments used during the study measure the issues they were intended to measure (Amin, 2005). Leung (2015) defines validity of a research instrument as the appropriateness of the tools, processes, and data. As

succinctly defined, validity refers to "whether you are observing, identifying, or measuring what you say you are" (Mason, 1996, 24 as cited in Bryman, 2012). Validity therefore encompasses what an instrument measures and how well it does so (Mohajan, 2017).

In this study, validity of instruments; questionnaire, and interview guides was seen as the quality of measurements by the instruments indicating the degree to which the measures reflect the underlying construct of the study.

To ensure the validity of the questionnaire instrument used in the study, the questionnaire items were readably clear with clear instructions, comprehensible at first glance, devoid of discrimination or bias, straightforwardly presented, specific, unambiguous and catch the complexity of issues required by the research objectives.

These questionnaire items were examined, scrutinised and refined by at least two senior lecturers from the department of science education, University of Education, Winneba. This is because according to Amin (2005) content and construct validity is determined by expert judgement. Pilot-testing is a method used to check if the research questionnaire items measure what they were supposed to measure and to check if the items and overall layout were understandable and interpreted in the same manner by all the participants. The questionnaire items were piloted test using 40 senior high school students and six Integrated Science teachers in another senior high school in another nearby district which is not part of the sample. This was done to establish and ensure clarity and comprehensibility of each item in the tool. The questionnaire items along with the responses were discussed and reviewed with the senior lecturers for refinement necessary as the need be. The researcher gathered information on where participants misunderstood the items and made amendments in the questionnaire items to re-align with the objectives of the study. Various aspects of content validity of the questionnaire

instrument such as quality and clarity of questions and instructions in the questionnaire and adequacy of the operational definition of variables were ensured.

To ensure the validity of the interview instrument used in the study, the researcher used interview guide with items to be discussed on factors affecting students' output in Integrated Science. The researcher prepared a semi-structured questions guide based on the research objectives, compared and contrasted specific information with information that was gained by means of other interviews. Having been supervised by the researcher's supervisor and accepted to be used, the researcher's role was to probe the participants for more information on the topic. A pilot study was conducted, which allowed testing of the interview questions, as well as interviewing style and approach. There was no change to the data collection instrument as the result of the pilot study. In the process, the researcher minimised bias, reactivity and limit variation in interview technique and addresses factors concerning the research as much as possible.

3.8 Reliability of the Instruments

Reliability is essentially an umbrella term for dependability, consistency and replicability over time, over instruments and over groups of respondents (Cohen, Manion & Morrison, 2018). A reliable instrument in a piece of research yields similar data from similar respondents over time. Reliability involves the rate at which the study results are repeatable (Bryman, 2012).

In this study, the reliability of the questionnaires was established by determining the reliability coefficient using the Cronbach Coefficient Alpha with the responses of the piloted test. Cronbach's alpha, the measure of internal consistency among items, provides a coefficient of each item with the sum of all other relevant items, and is thus useful for multi-item scales (Cohen, Manion & Morison, 2018). Cronbach's alpha was used because the items on both questionnaires were measured on a five-point scale such

as 1 = Strongly Disagree, 2 = Disagreed, 3 = No Opinion, 4 = Agreed, and 5 = Strongly Agreed. The coefficient when determined guaranteed the reliability of the instrument used. According to Pallant (2010), a reliability coefficient of 0.70 or higher is considered appropriate. The reliability coefficient (Cronbach's alpha) was determined to be 0.80 and deemed reliable for the study.

For the semi-structured interview, reliability was seen as credibility, trustworthiness, and conformability. As such, reliability was established by minimising bias, threats and demonstrating a degree of accuracy and comprehensiveness of coverage in the natural setting (Cohen, Manion & Morison, 2018). The researcher also ensured the indicators of the construct under investigation were fair and operationalised, minimised reactivity and focused on factors concerning the research for reliable evidence for the study.

3.9 Data Collection Procedure

An introduction letter was obtained from the Department of Integrated Science Education, University of Education, Winneba, to conduct research in the two public Senior High Schools in the Jomoro Municipality. The letter was delivered to the two headmasters in the Senior High Schools in order for the researcher to carry out the study. Having sought the consent of the management of the senior high schools, the students and the teachers that were selected to participate in the study were contacted. Participants were allowed to participate in the study voluntarily. The quantitative data and qualitative data collection phases occur concurrently.

In the quantitative phase, the researcher explains the purpose of the study and the nature of the questionnaires to the participants (teachers and students), and the questionnaires on the perceived factors affecting students' academic performance in Integrated Science were given to students and their teachers personally so as to clarify issues for the respondents when necessary and also to ensure high percentage return rate. The

questionnaires were administered to the 312 participants of which 294 were students and 18 teachers that were selected from the two Senior High Schools for the study and allowed to complete the questionnaires on their own. The participants were assured of the confidentiality of the data provided and their anonymity during the analysis of data. The participants completed and submitted the questionnaire within five days and the researcher collected them back.

The qualitative phase involved semi-structure individual interview with the four experienced teachers (HODs and assistant headmasters for academic) in the two senior high schools per mutual schedule on the perceived factors affecting students' academic performance in Integrated Science in the Jomoro Municipality. Open-ended questions with follow-up probes were used to explore the participants' perceived factors affecting students' academic performance in Integrated Science in their schools. Every effort was made to create a comfortable and non-threatening approach. The interviews were conducted on an empathetic and conversational style (Ashworth & Lucas, 2000). The interviews were twenty-five to forty-five minutes in duration and audiotaped.

The questionnaires were given to both teachers and students, and were self-administered. The three-hundred and twelve questionnaires were distributed to both student and teachers and all were returned. It was possible to get a 100% return rate because the researcher was present during the completion of the questionnaires and ensured that all the questionnaires were collected from all participants after completion. All the participants responded to all questions as thorough clarifications were given where they did not understand. Due to ethical considerations the researcher does not force any participant to answer any question.

To answer the research question, items were crafted and measured on a five-point Likert Scale with 1= strongly disagree, 2= disagree, 3= no opinion, 4 = agree and 5= strongly

agree where 1 indicates the least agreement to the statement and 5 indicating the strongest agreement to the statement in order to capture teachers and students' perceptions on the topic. The teachers and students' perceptions on the topic were analysed statistically and presented in the form of percentages and frequencies in tables.

3.10 Method of Data Analysis

Data analysis was defined as a systematic process involving working with data, organising and breaking them into manageable units (Bogdan & Biklen, 2007). Data analysis simply denotes the way the researcher makes meanings of the data collected. It involves synthesising data, searching patterns, discovering what is important, what is to be learned and deciding what to tell others.

In this study, data collected were quantitative and qualitative in an attempt to examine the perceived factors affecting student's academic performance in Integrated Science. Hence, data analysis continued throughout the data collection phase. The process of data analysis started by examining the collected data for completeness, accuracy and consistency. Data completeness refers to the expected comprehensiveness or wholeness of the data in the study. It involves checking for all expected data to ensure that there is comprehensiveness of material, or for reducing the dependence on prior interpretations by the researcher. In the questionnaire surveys, the researcher cross-checked for missing answers from all sections of the survey to avoid false conclusions. Data accuracy refers to error-free records that can be used as a reliable source of information. Inaccuracies may arise out of carelessness or poor data entry practices on the part of respondents. A tick in the wrong box, a ring round the wrong code, an error in simple arithmetic all can reduce the validity of the data unless they are picked up in the editing process in order to enhance data quality.

Data consistency refers to the process by which data is entered in a logically consistent way or kept as uniformly as possible throughout the collection process. It was checked to ensure that respondents have interpreted instructions and questions uniformly and that entries were consistent with each other. A check on uniformity of interpretation of respondents' responses helped eradicate errors. The responses from all the questions were categorised and edited (where necessary) so as to improve upon the quality of the data.

In the data analysis of the questionnaires, the questionnaires data were cross-checked, verified, and encoded into a computer system and with the aid of Statistical Package for Social Sciences (SPSS, version 21.1), data then were analysed using descriptive statistics and descriptively presented with frequencies and percentages in tables.

The interview data analysis included systematically organising data to generate themes, categories and simple summary. In the data analysis of the interviews, the information was first read by the researcher. Secondly, the data was placed in sub topics of the study. For instance, all data that explained on the effects of teachers' quality on the students' academic performance was categorised under the same theme. Then the common patterns in each category was re-read for acceptance and rejection. The researcher then narrates in each category using quotes from the interviewees. And finally interpret the narrations from respondents to gain meaning out of it. All category of data were led by the research questions. Each category was examined to gain an understanding of participants' perceptions on factors affecting students' output in Integrated Science yielding triangulation of data and offering complementary data on the topic in question. The researcher employed both descriptive and inferential statistics in the analysis of the data collected in the study, drawing together a fair, coherent and defensible

representation of the data and their conclusions drawn from the coherent perspectives from the different data.

Both quantitative and qualitative data were analysed separately and then integrated during discussion of the results. Both data were then compared, reorganised and merged to produce result that give answers to the research questions. The method of organising and analysing data in this study was by research question (Cohen, Manion & Morrison, 2018).

3.11 Ethical considerations

Hickey (2018), defines ethics as a code of conduct that determines how people relate with each other. According to Saunders, Lewis, and Thornhill (2012), ethics is how appropriate the behaviour of the author is, with regards to the rights of participants or the subjects of the research or those who are directly or indirectly affected by the research. They further explained that good researchers take into consideration ethical requirements, principles and values throughout the research. According to Cohen, Manion, and Morrison (2018), "whatever the specific nature of the work, researchers must take into account the effects of the research on participants, and act in such a way as to preserve their dignity as humans" (p. 56). As the study involves humans as subjects, moral and ethical issues were embedded in the human research, especially when rights and privacy were considered (Amedeker, 2016).

Owing to the above, the researcher considered the ethical issues very serious because there was the need to respect and ensure integrity in the conduct of the study. Ethical issues such as informed consent, right to privacy, voluntary participation, no harm to participants, anonymity and confidentiality were fulfilled. Permission was sought from relevant authorities such as the school authorities, teachers concern and students who were the participants of the study. The researcher also sought individual permission

from respondents before they took part in responding to questionnaires. Confidentiality of the information collected during and after the collection of data was assured by avoiding the use of names and addresses of participants in the study. Ethically speaking, the identities of subjects in the study were respected and not disclosed. Questionnaire Consent forms were signed to indicate their voluntary participating in the study. Those that agreed to take part in the study did so out of their own free will.

3.12 Chapter Summary

This chapter described the research design and explained why it was chosen, sampling methods used in the study were also discussed in detail. The chapter further described the data collection instruments and the rationale behind their selection. The researcher also described how the methodology was followed to gather and analyse data. The chapter also clarified how validity and reliability was ensured and also explained how the ethical considerations were adhered to during the collection of the data.
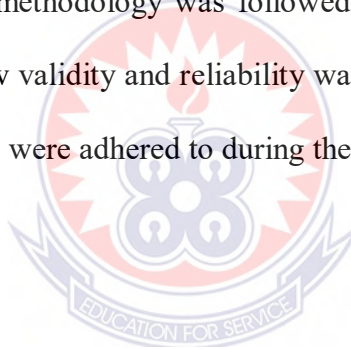
CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Overview

This chapter presented the outcome of the responses from the teachers and the students on the perceived contributing factors on students' academic performance in Integrated Science, and explained the analysis of the results. The significant and novel findings were identified, interpreted and discussed.

4.1 Background of the respondents

This section shows the background of the respondents according to gender as per section A of the questionnaires (Appendices B & C).

4.1.1 Gender distribution of teachers and students

The Table 1 shows the gender distribution of teachers and students for the study.

Table 1: Gender distribution of teachers and students in the participant schools

School	N	Gender of teachers		Gender of students	
		Males	**Females**	**Males**	**Females**
Half Assini SHS	204	11	2	96	96
Annor Adjei SHS	110	6	1	52	51
Total	314	17(85.0%)	3(15%)	148(50.7%)	147(49.3%)

N=Number of respondents

The Table 1 presents the profile of respondents in terms of gender, wherein 148 out of 294 students are males while the remaining 147 are females.

Also, there are 12 more male teacher respondents in the survey than female teacher respondents (Table 1).

The data in the Table 1 indicates that the process of choosing the students' participants complies with the principle of equal representation and gender balance as there are

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almost equally distributed male and female student participants in the study (Table 1). This competitive number of males and females indicates that, education in the Jomoro Municipality is considered a priority for both sexes. The data on teachers indicate that only three female teachers are teaching Integrated Science in the Municipality.

4.2 Questionnaire data on teachers and students perceived factors

This section presents the questionnaire data collected from teachers and students on perceived factors.

4.2.1 Questionnaire data on teachers and students perceived students' environmental-related factors

The environment-related factors include the home, school and the student community.

Home environmental variables

The responses to questionnaire items 1-4 on how students' home environmental variables such as conduciveness, parental support, parental supervision, and parental education affect students' academic performance in Integrated Science are presented in Table 2.

Table 2: A frequency Table showing students' home variables as perceived by teachers and students

Statement	Respondents	Strongly disagree F (%)	Disagree F (%)	No opinion F (%)	Agree F (%)	Strongly agree F (%)	Total F (%)
1). Student's home is conducive for learning Integrated Science.	Teachers	7(36.2)	8(46.8)	0(0.0)	2(09.0)	1(08.0)	18(100)
	Students	119(40.4)	108(36.8)	17(05.8)	26(09.0)	24(08.0)	294(100)
2). Student's parent/s involve(s) and support(s) science learning.	Teachers	10(55.6)	6(33.3)	0(00.0)	1(05.6)	1(05.6)	18(100)
	Students	94(32.1)	68(23.0)	6(02.2)	64(21.6)	62(21.1)	294(100)
3). Student's parents do not supervise what and when he/she does.	Teachers	0(00.0)	0(00.0)	1(05.6)	5(27.8)	12(66.7)	18(100)
	Students	32(11.0)	25(08.4)	10(03.4)	103(34.9)	124(42.3)	294(100)
4). Student's parent/s are well educated.	Teachers	15(83.3)	3(16.7)	0(00.0)	0(00.0)	0(00.0)	18(100)
	Students	114(38.7)	73(24.7)	11(03.9)	51(17.3)	45(15.4)	294(100)

F=frequency

Source: Field data (2023)

Table 2 shows that 15 teachers out of 18 representing 83.0% disagreed that students' home environments were conducive while only three teachers (17%) agreed to the same statement. Also, 227 students out of 294 (77.2%) disagreed that students' home environments were conducive, 17(5.8%) have no opinion while 30 agreed (Table 2). Concerning parents' involvement and support for students' science learning, 16 out of 18 Integrated Science teachers (88.9%) disagreed that parents are involved and support students' science learning while only two teachers (11.1%) agreed (Table 2). Also, 162 students out of 294 (55.1%) disagreed that parents are involved and support their science learning, six students (2.2%) have no opinion while 126 out of 294 (42.2%) agreed.

Again, 17 teachers out of 18 (94.4%) agreed that students' parents do not supervise what and when they do their things while one teacher has no opinion. On the same statement, 227 students out 294 (77.2%) agreed that their parents do not supervise what and when they do their things, 10(3.4%) have no opinion while 57(19.4%) disagreed. Furthermore, all the 18 teachers (100%) disagreed that students' parents are well educated. On the other hand, 177 students out of 294 (63.4%) disagreed that their parents are well educated, while 11(3.9%) have no opinion and 96 (32.7%) agreed to the statement as true.

Findings on student home from Table 2

The results from Table 2 indicate that:

- A greater number of teachers, 15(83.0%) and large number of students, 227(77.2%) perceived that students' home environments were not conducive for the studies of Integrated Science.

- A greatest number of teachers, 16(88.9%) and a greater number of students, 162(55.1%) perceived that parents do not involve or support students for the studies of Integrated Science.

- Almost all teachers, 17(94.4%) and the greatest number of students, 227(77.2%) perceived that parents do not supervise what and when students do their things, whether watching TV movies or following friends around or learning science.

- All the teachers, 18(100%) and a greater number of students, 177(63.4%) perceived that the students' parents were not well educated.

School environmental variables

The responses to questionnaire items 5-8 on how school's environmental variables such as meals, classroom space, reading and learning materials, and teaching learning materials affect students' academic performance in Integrated Science are presented in Table 3.

Table 3: Frequency Table showing school's variables as perceived by teachers and students

Statement	Respondents	Strongly disagree F (%)	Disagree F (%)	No opinion F (%)	Agree F (%)	Strongly agree F (%)	Total F (%)
5). The school provides students with good meals.	Teachers	4(22.2)	6(33.3)	1(05.6)	3(18.7)	4(22.2)	18(100)
	Students	93(31.5)	84(28.7)	0(00.0)	93(31.7)	24(08.0)	294(100)
6). Adequate classrooms' space for learning.	Teachers	7(38.9)	8(44.4)	0(00.0)	3(18.7)	0(00.0)	18(100)
	Students	78(26.5)	84(28.5)	13(04.5)	55(18.6)	64(21.9)	294(100)
7). Inadequate reading and learning materials.	Teachers	0(00.0)	5(27.8)	0(00.0)	6(33.3)	7(38.9)	18(100)
	Students	58(19.6)	69(23.7)	9(02.9)	66(22.4)	92(31.4)	294(100)
8). Inadequate teaching and learning materials	Teachers	0(00.0)	0(00.0)	0(00.0)	7(38.9)	11(61.1)	18(100)
	Students	24(08.0)	32(10.9)	20(06.8)	99(33.7)	119(41.6)	294(100)

F=frequency

Source: Field data (2023)

Table 3 shows that 10 out of 18 Integrated Science teachers (55.5%) disagreed that the schools provide students with good meals, one has no opinion, while seven teachers

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(40.9%) agreed to the same statement. Also, 177 students out of 294(60.2%) disagreed that the schools provide students with good meals, while 116(39.8%) agreed (Table 3). Concerning classrooms adequacy for students' science learning, 15 out of 18 Integrated Science teachers (83.3%) disagreed that the schools have adequate classrooms for students' science learning while three teachers (18.7%) agreed. Also, 162 students out of 294(55.1%) disagreed that the schools have adequate classrooms for science learning, 13(4.5%) have no pinion while 119 out of 294(40.5%) agreed to the same statement (Table 3).

Again, on issue relating to reading and learning materials, 13 teachers out of 18 (72.2%) agreed that the schools have inadequate reading and learning materials while 5(27.8%) disagreed (Table 3). On the other hand, 158 students out 294(53.8%) agreed, 9(2.9%) have no opinion while 127(43.3%) disagreed to the same statement.

Furthermore, on teaching and learning materials, all the 18 teachers (100%) disagreed that the schools have inadequate teaching and learning materials. On the other hand, 218 students out 294(75.3%) agreed that the schools have inadequate teaching and learning materials, 20(6.8%) have no opinion while 56(18.9%) disagreed to the statement (Table 3).

Findings on school environment from Table 3

The results from Table 3 indicate that:

- A greater number of teachers, 10(55.5%) and large number of students, 177(60.2%) perceived that the schools do not provide students with good meals.

- A greater number of teachers, 15(83.3%) and a large number of students, 162(55.1%) perceived that the schools lack adequate classrooms for the studies of Integrated Science.

- More of the teachers, 13(72.2%) and the greatest number of students, 158(53.8%) perceived that the schools have inadequate reading and learning materials or resources for learning science.

- All the teachers, 18(100%) and a greater number of students, 218(75.3%) perceived that the schools have inadequate teaching and learning materials or instructional materials for science lessons.

Community-related variables

The responses to questionnaire items 9-12 on how community-related variables such as socioeconomic background, students' interest, reaction to ethnicity and interactions affect students' academic performance in Integrated Science are presented in Table 4.

Table 4: A frequency Table showing community-related variables as perceived by teachers and students

Statement	Respondents	Strongly disagree F (%)	Disagree F (%)	No opinion F (%)	Agree F (%)	Strongly agree F (%)	Total F (%)
9). Student socio-economic background influences negatively their conduct and behaviour.	Teachers	0(00.0)	4(22.2)	0(00.0)	6(33.3)	8(44.4)	18(100)
	Students	23(07.7)	50(17.0)	9(03.2)	96(32.7)	116(39.4)	294(100)
10). Student-peer group interest influences positively their class attendance and work.	Teachers	2(11.1)	10(55.6)	0(00.0)	4(22.2)	2(11.1)	18(100)
	Students	78(26.6)	114(38.8)	6(01.9)	72(24.4)	24(08.3)	294(100)
11) Student reaction to ethnicity negatively affect their learning.	Teachers	0(00.0)	2(11.1)	0(00.0)	8(44.4)	8(44.4)	18(100)
	Students	32(11.0)	24(08.3)	10(03.4)	103(34.9)	125(42.4)	294(100)
12). Student-peer class interactions influence positively good academic behaviour.	Teachers	2(11.1)	2(11.1)	0(00.0)	6(33.3)	8(44.4)	18(100)
	Students	24(08.3)	43(14.5)	26(09.0)	102(34.6)	99(33.6)	294(100)

F=frequency

Source: Field data (2023)

Table 4 shows that 14 out of 18 Integrated Science teachers representing 77.8% agreed that student socio-economic background negatively affect students' conduct and behaviour, while four teachers representing 22.2% disagreed. Also, 212 students out of

294 representing 72.1% agreed that their socio-economic background negatively affect their conduct and behaviour, nine have no opinion, while 73(24.7%) disagreed (Table 4).

Concerning peer-group interest and students' class attendance and work, 12 out of 18 Integrated Science teachers representing 66.7% disagreed that peer-group interest positively influences students' class attendance and work while six teachers representing 33.3% agreed (Table 4). Also, 192 students out of 294 representing 65.4% disagreed that their peer-group interest positively influences their class attendance and work, 6(1.9%) have no pinion while 96(32.7%) agreed to the same statement.

Again, on issue relating to students' reaction to ethnicity, 16 teachers out of 18 representing 88.9% agreed that students' reaction to ethnicity negatively affect their learning while 2(11.1%) disagreed. On the same statement, 228 students out 294 representing 77.3% agreed, 10(3.4%) have no opinion while 56(19.3%) disagreed (Table 4).

Furthermore, on student-peer class interactions, 14 teachers out of 18 representing 77.8% greed that student-peer class interactions influence positively good academic behaviour in the schools while 4(22.2%) disagreed. On the same statement, 201 students out 294 representing 68.2% agreed, 26(9.0%) have no opinion while 67 (22.8%) disagreed to the statement (Table 4).

Findings on student peers from Table 4

The results in Table 4 indicate that:

- A greater number of teachers, 14(77.8%) and large number of students, 212(72.1%) perceived that students' socio-economic background influences negatively their conduct and behaviour.

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- A greater number of teachers, 12(66.7%) and a large number of students, 192(65.4%) perceived that students' peer-group interest affect their class attendance and work.

- Almost all the teachers, 16(88.9%) and a greatest number of students, 228(77.3%) perceived that students' reaction to ethnicity negatively affect their learning.

- A greater number of the teachers, 14(77.8%) and a greater number of students, 201(68.2%) perceived that student-peer class interactions influence positively good academic behaviour in the schools.

4.2.2 Questionnaire data on teachers and students perceived teacher-related factors

The teacher-related variable includes the teacher qualification, teaching methodology and teacher's attitude toward Integrated Science.

Teacher qualification variables

The responses to questionnaire items 13-16 on how teachers' qualification variables such academic qualification, adequacy of professional Integrated Science teachers, confidence and subject matter teaching contribute toward students' performance in Integrated Science are presented in Table 5.

Table 5: A frequency Table showing teachers' qualification variables as perceived by teachers and students

Statement	Respondents	Strongly disagree F (%)	Disagree F (%)	No opinion F (%)	Agree F (%)	Strongly agree F (%)	Total F (%)
13). Teacher's academic qualification affects students.	Teachers	0(00.0)	1(05.6)	0(00.0)	13(72.2)	4(22.2)	18(100)
	Students	46(15.6)	33(11.2)	16(05.5)	92(31.4)	107(36.3)	294(100)
14). Low confidence of a teacher in teaching negatively affects students.	Teachers	0(00.0)	0(00.0)	0(00.0)	5(27.8)	13(72.2)	18(100)
	Students	23(07.7)	35(11.9)	13(04.3)	122(41.5)	101(34.6)	294(100)
15). Adequate professional Integrated Science teachers in school.	Teachers	14(77.8)	4(22.2)	0(00.0)	0(00.0)	0(00.0)	18(100)
	Students	83(28.2)	74(25.3)	30(10.3)	55(18.6)	52(17.6)	294(100)
16). Holistic subject matter positively affects learning.	Teachers	4(22.2)	4(22.2)	0(00.0)	4(22.2)	6(33.3)	18(100)
	Students	24(08.0)	32(10.9)	15(05.1)	95(32.4)	128(43.6)	294(100)

F=frequency

Source: Field data (2023)

Table 5 shows that 17 out of 18 Integrated Science teachers representing 94.4% agreed that teachers' academic qualification affects students, while only one teacher representing 5.6% disagreed. Also, 199 students out of 294 representing 67.7% agreed that teachers' academic qualification affects their studies, 16(5.5%) have no opinion, while 79(26.9%) disagreed (Table 5).

Concerning confidence in teaching, all 18(100%) Integrated Science teachers agreed that low confidence in teaching negatively affect students. Also, 123 students out of 294 representing 76.1% agreed, 13(4.3%) have no pinion while 58(19.6%) disagreed to the same statement (Table 5).

Again, on issue relating to adequacy of professional Integrated Science teachers in the schools, all 18(100%) teachers disagreed that adequate professional Integrated Science teachers are in the schools. On the other hand, 157 students out 294 representing 53.5%

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disagreed, 30(10.3%) have no opinion while 107(36.2%) agreed to the same statement (Table 5).

Furthermore, on issue relating to holistic subject matter, 10 teachers out of 18 representing 55.6% agreed that holistic subject matter does positively affects learning while 8(44.4%) disagreed. On the same statement, 223 students out 294 representing 76.0% agreed that holistic subject matter positively affects their learning, 15(5.1%) have no opinion while 56 (18.9%) disagreed (Table 5).

Findings on teacher qualification from Table 5

The results in Table 5 indicate that:

- A greater number of teachers, 17(94.4%) and large number of students, 199(67.1%) perceived that teachers' academic qualification affects students.

- All 18 teachers (100%) and a large number of students, 123(76.1%) perceived that low confidence in teaching negatively affects students.

- All the teachers, 18(100%) and the greatest number of students, 157(53.5%) perceived that there were inadequate professional Integrated Science teachers in the schools for students.

- A greater number of the teachers, 10(55.6%) and a greatest number of students, 223(68.2%) perceived that holistic subject matter positively affects learning in the schools.

Teaching methodological variables

The responses to questionnaire items 17-20 on how the teaching methodology variables such varying lesson styles to suit students, engaging students, and using appropriate materials in lessons contribute toward students' performance in Integrated Science are presented in Table 6.

Table 6: A frequency Table showing teaching methodology variables as perceived by teachers and students

Statement	Respondents	Strongly disagree F (%)	Disagree F (%)	No opinion F (%)	Agree F (%)	Strongly agree F (%)	Total F (%)
17). Teacher varies teaching styles and approaches to suit the class.	Teachers	0(00.0)	9(50.0)	0(00.0)	5(27.8)	4(22.2)	18(100)
	Students	92(31.4)	91(30.8)	32(10.9)	62(21.2)	17(05.7)	294(100)
18). Teacher engages students in the teaching and learning process.	Teachers	0(00.0)	6(33.4)	0(00.0)	4(22.2)	8(44.4)	18(100)
	Students	74(25.0)	56(19.2)	29(09.9)	74(25.0)	61(20.8)	294(100)
19). Uses different but appropriate teaching and learning materials during lessons.	Teachers	14(77.8)	4(22.2)	0(00.0)	0(00.0)	0(00.0)	18(100)
	Students	111(37.8)	97(33.0)	7(02.6)	53(17.9)	26(08.7)	294(100)
20). Identifies students with problems and assist them individually.	Teachers	17(94.4)	1(05.6)	0(00.0)	0(00.0)	0(00.0)	18(100)
	Students	102(34.8)	100(34.1)	3(01.0)	80(27.2)	9(02.9)	294(100)

F=frequency

Source: Field data (2023)

Table 6 shows that 9 out of 18 Integrated Science teachers (50.0%) agreed that teachers vary teaching styles and approaches to suit students, while 9(50.0%) teachers disagreed to the same statement. Also, 183 students out of 294(62.2%) disagreed that teachers vary teaching styles and approaches, 32(10.9%) have no opinion, while 79(26.9%) agreed (Table 6).

Concerning students' engagement in the teaching and learning process, 12 out 18 Integrated Science teachers (66.6%) agreed that they engage students in the teaching and learning process while 6(33.4%) disagreed. Also, 135 students out of 29 (45.8%) agreed, 29(9.9%) have no pinion while 130(44.2%) disagreed to the same statement (Table 6).

Again, on issue relating to the use of different but appropriate teaching and learning materials during lessons, all 18(100%) teachers disagreed that they use different but appropriate teaching and learning materials during lessons. On the same statement, 208 students out 294(70.8%) disagreed, 7(2.6%) have no opinion while 79(26.6%) agreed (Table 6).

Furthermore, all 18(100%) Integrated Science teachers disagreed that they identify students with problems and assist them individually in the schools. On the same statement, 202 students out 294 representing 68.9% disagreed, 3(1.0%) have no opinion while 89 (30.1%) agreed (Table 6).

Findings on teacher teaching methodology from Table 6

The results in Table 6 indicate that:

- Half of the number of teachers, 9(50.0%) and a large number of students, 183(62.2%) perceived that teachers' do not vary teaching styles and approaches in class for students.

- A greater number of Integrated Science teachers, 12(66.6%) and a large number of students, 135(45.9%) perceived that students were engaged in the teaching and learning process.

- All the teachers, 18(100%) and the greater number of students, 208(70.8%) perceived that teachers do not use different but appropriate teaching and learning materials during lessons.

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- All the teachers, 18(100%) and a large number of students, 202(68.9%) perceived that teachers do not identify students with problems and assist them individually in the schools.

Teacher attitudinal variables

The responses to questionnaire items 21-24 on how the teachers' attitudinal variables such as laziness, lateness, and absenteeism contribute toward students' performance in Integrated Science are presented in Table 7.

Table 7: A frequency Table showing teachers' attitudinal variables as perceived by teachers and students

Statement	Respondents	Strongly disagree F (%)	Disagree F (%)	No opinion F (%)	Agree F (%)	Strongly agree F (%)	Total F (%)
21). Regular for Integrated Science lessons.	Teachers	0(00.0)	8(44.5)	0(00.0)	4(22.2)	6(33.3)	18(100)
	Students	62(21.2)	73(24.8)	23(07.7)	62(21.2)	74(25.1)	294(100)
22). Sensitive and easily approachable to students during lessons.	Teachers	0(00.0)	7(38.9)	0(00.0)	7(38.9)	4(22.2)	18(100)
	Students	60(20.5)	82(27.9)	11(03.8)	74(25.0)	67(22.8)	294(100)
23). Comes often late for Integrated Science lessons.	Teachers	14(77.8)	4(22.2)	0(00.0)	0(00.0)	0(00.0)	18(100)
	Students	70(23.7)	58(19.6)	8(02.7)	66(22.6)	92(31.4)	294(100)
24). Do not promptly give feedback to students on academic progress.	Teachers	3(16.7)	5(27.8)	0(00.0)	7(38.8)	3(16.7)	18(100)
	Students	53(18.0)	71(24.0)	17(05.9)	80(27.2)	73(24.9)	294(100)

F=frequency

Source: Field data (2023)

Table 7 shows that 10 out of 18 Integrated Science teachers representing 55.5% agreed that they are regular for lessons, while 8(44.5%) teachers disagreed. Also, 136 students

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out of 294 representing 46.3% agreed, 23(7.7%) have no opinion, while 135(46.0%) disagreed (Table 7).

Concerning teachers' sensitivity and approachability, 11 out 18 teachers representing 61.1% agreed that they are sensitive and easily approachable to students during lessons, while 7(38.9%) disagreed. Also, 141 students out of 294 representing 47.8% agreed, 11(3.8%) have no pinion while 142(48.2%) disagreed that teachers are sensitive and easily approachable them during lessons (Table 7).

Again, on issue relating to teachers' punctuality for lessons, all 18(100%) teachers disagreed that they come often late for science lessons. On the same statement, 128 students out 294 representing 43.3% disagreed, 8(2.7%) have no opinion while 158(54.0%) agreed that teachers come often late for science lessons (Table 7).

Furthermore, on issue relating to promptly giving of feedback to students on academic progress, 10 out of 18 Integrated Science teachers representing 55.5% agreed they do not give prompt feedback to students on academic progress while 8(44.5%) disagreed. On the same statement, 124 students out 294 representing 42.0% disagreed, 17(5.9%) have no opinion while 153(52.1%) agreed (Table 7).

Findings on teacher's attitude from Table 7

The results in Table 7 indicate that:

- A large number of teachers, 10(55.5%) and a greater number of students, 136(46.3%) perceived that the teachers were regular for all science lessons in class.

- A greater number of Integrated Science teachers, 11(61.1%) and a least number of students, 141(47.8%) perceived that teachers are sensitive and easily approachable to students during lessons.

- All the teachers, 18(100%) disagreed that they come often late for science lessons while a greater number of students, 158(54.0%) perceived that teachers come often late for science lessons.

- A greater number of teachers, 10(55.5%) and a large number of students, 153(52.1%) perceived that teachers do not give prompt feedback to students.

4.2.3 Questionnaire data on teachers and students perceived student-related factors

Student- related factors such as their subject interest, expectation and learning habits were the focus of this study in Integrated Science in the Jomoro Municipality.

Student interest variable

The responses to questionnaire items 25-28 on how students' interest towards Integrated Science, class attendance, and class activities affect their academic performance in Integrated Science are presented in Table 8.

Table 8: A frequency Table showing students' interest variables as perceived by teachers and students

Statement	Respondents	Strongly disagree F (%)	Disagree F (%)	No opinion F (%)	Agree F (%)	Strongly agree F (%)	Total F (%)
25). Attends almost all Integrated Science lessons on average.	Teachers	7(36.2)	8(46.8)	0(0.0)	2(09.0)	1(08.0)	18(100)
	Students	74(25.3)	88(29.8)	14(04.8)	68(23.1)	50(17.0)	294(100)
26). Actively involve in almost all activities of learning science in the school.	Teachers	10(55.6)	6(33.3)	0(0.0)	1(5.6)	1(5.6)	18(100)
	Students	79(26.6)	76(25.9)	16(05.4)	62(21.2)	61(20.8)	294(100)
27). Do almost all exercises and assignment promptly.	Teachers	12(66.7)	1(5.6)	0(0.0)	5(27.8)	0(0.0)	18(100)
	Students	69(23.3)	86(29.2)	9(03.3)	66(22.4)	64(21.8)	294(100)
28). Devote no time for studying Integrated Science.	Teachers	0(0.0)	0(0.0)	0(0.0)	3(16.7)	15(83.3)	18(100)
	Students	24(8.1)	34(11.5)	15(05.1)	122(41.6)	99(33.7)	294(100)

F=frequency

Source: Field data (2023)

Table 8 shows that 15 out of 18 teachers representing 83.0% disagreed that students attend almost all Integrated Science lessons on average, while 3(17.0%) teachers agreed. Also, 162 students out of 294 representing 55.1% disagreed to the same statement, 14(4.8%) have no opinion, while 118(40.1%) agreed (Table 8).

Concerning involvement in learning activities, 16 out 18 teachers representing 88.9% disagreed that students actively involve in almost all activities of science learning in the school, while 2(11.2%) agreed to the same statement. On the other hand, 155 students out of 294 representing 52.5% disagreed, 16(05.4%) have no pinion, while 123(42.1%) agreed that students actively involve in almost all activities of science learning in the school (Table 8).

Again, on issue doing exercises and assignments, 13 out of 18 teachers representing 72.3% disagreed that students do all exercises and assignment promptly, while 5(27.8%) agreed to statement. On the same statement, 155 students out 294 representing 52.5% disagreed, 9(03.3%) have no opinion, while 130(44.2%) agreed that they do their exercises and assignment promptly for science (Table 8).

Furthermore, on issue relating to time devote for studying Integrated Science, all the teachers (100%) agreed that students devote no time for studying Integrated Science. On the same statement, only 58 students out 294 representing 19.6% disagreed, 15(05.1%) have no opinion, while 221(75.3%) agreed that they devote no time for studying Integrated Science in the schools (Table 8).

Findings on students' interest from Table 8

The results in Table 8 indicate that:

- A large number of teachers, 15(83.0%) and a greater number of students, 162(55.1%) perceived that the students do not attend almost all Integrated Science lessons in the schools.

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- A greater number of Integrated Science teachers, 16(88.9%) and a large number of students, 155(52.5%) perceived that students do not actively involve in all activities of learning science in the schools.

- A greater number of teachers, 13(72.3%) and a greater number of students, 155(52.5%) perceived that students do not do all exercises and assignment promptly.

- All the teachers, 18(100.0%) and a greater number of students, 221(75.3%) perceived that students devote no time for studying Integrated Science in the schools.

Student expectation variable

The responses to questionnaire items 29-32 on how students' expectations toward Integrated Science and career projections affect their academic performance in Integrated Science are presented in Table 9.

Table 9: A frequency Table showing students' expectation variables as perceived by teachers and students

Statement	Respondents	Strongly disagree F (%)	Disagree F (%)	No opinion F (%)	Agree F (%)	Strongly agree F (%)	Total F (%)
29). Expect enjoyable science lessons for life.	Teachers	7(38.9)	8(44.4)	0(0.0)	2(11.1)	1(05.6)	18(100)
	Students	100(34.1)	93(31.7)	40(13.6)	21(07.0)	40(13.6)	294(100)
30). Expect to do more science practical investigations on some topics.	Teachers	1(5.6)	6(33.3)	0(0.0)	10(55.6)	1(05.6)	18(100)
	Students	23(07.7)	54(18.4)	8(02.6)	117(39.9)	92(31.4)	294(100)
31). Expect the school to provide all learning resources accessible to them.	Teachers	1(05.6)	5(27.8)	0(0.0)	12(66.7)	0(0.0)	18(100)
	Students	69(23.6)	58(19.6)	6(01.9)	69(23.6)	92(31.3)	294(100)
32). Expect to pass Integrated Science with ease.	Teachers	0(0.0)	3(16.7)	0(0.0)	15(83.3)	0(0.0)	18(100)
	Students	42(14.1)	80(27.2)	17(05.8)	99(33.7)	56(19.2)	294(100)

F=frequency

Source: Field data (2023)

Table 9 shows that 15 out of 18 teachers representing 83.3% disagreed that students expect enjoyable science lessons for life, while 3(16.7%) teachers agreed to the same statement. Also, 193 students out of 294 representing 65.8% disagreed to the same statement, 40(13.6%) have no opinion, while 61(20.6%) agreed that they expect enjoyable science lessons for life.

Concerning science practical investigations, 11 out 18 teachers representing 61.2% agreed that students expect to do science practical investigations on some topics in the schools, while 7(38.8%) disagreed. Also, 209 students out of 294 representing 72.3% agreed to the statement, 8(02.6%) have no pinion, while 77(26.1%) disagreed (Table 9).

Again, on issue relating accessing learning resources, 12 out of 18 teachers representing 66.7% agreed that students expect the school to provide all learning resources accessible to them, while 6(34.3%) disagreed to the statement. On the same statement, 161 students out 294 representing 54.9% agreed, 6(01.9%) have no opinion, while 127(43.2%) disagreed (Table 9).

Furthermore, on issue relating to students passing Integrated Science, 15 out of 18 teachers representing 83.3% agreed that students expect to pass Integrated Science with ease while 3(16.7%) disagreed. On the same statement, 155 students out 294 representing 52.9% agreed, 17(05.8%) have no opinion, while 122(41.3%) disagreed.

Findings on students' expectation from Table 9

The results in Table 9 indicate that:

- A large number of teachers, 15(83.3%) and a greater number of students, 193(65.8%) perceived that the students do not expect enjoyable science lessons for life in the schools.

- A large number of Integrated Science teachers, 11(61.2%) and greater number of students, 209(72.3%) perceived that expect to do more science practical investigations on some topics in the schools.

- A large number of Integrated Science teachers, 12, representing 66.7% and a greater number of students, 161(54.9%) perceived that students expect the schools to provide all learning resources accessible to students.

- A greater number of Integrated Science teachers, 15, representing 83.3% and a greater number of students, 155(52.9%) perceived that students expect to pass Integrated Science with ease.in the schools.

Student learning habits variable

The responses to questionnaire items 33-36 on how students' learning habits toward Integrated Science affect their academic performance in Integrated Science are presented in Table 10.

Table 10: A frequency Table showing students' learning habit variables as perceived by teachers and students

Statement	Respondents	Strongly disagree F (%)	Disagree F (%)	No opinion F (%)	Agree F (%)	Strongly agree F (%)	Total F (%)
33). Regularly revise the subject before class.	Teachers	8(44.4)	8(44.4)	0(0.0)	2(11.1)	0(0.0)	18(100)
	Students	93(31.8)	84(28.5)	15(05.1)	74(25.0)	28(09.6)	294(100)
34). Have no schedule for Integrated Science.	Teachers	1(5.6)	1(5.6)	0(0.0)	6(33.3)	10(55.6)	18(100)
	Students	55(18.6)	40(13.5)	13(04.5)	79(26.9)	107(36.5)	294(100)
35). Take personal notes from lessons for revision.	Teachers	12(66.7)	1(5.6)	0(0.0)	5(27.8)	0(0.0)	18(100)
	Students	77(26.3)	115(39.1)	22(07.4)	52(17.6)	28(09.6)	294(100)
36). Search for supplementary reading materials and notes on science.	Teachers	15(83.3)	0(0.0)	0(0.0)	3(16.7)	0(0.0)	18(100)
	Students	73(24.7)	142(48.4)	0(00.0)	49(16.7)	30(10.2)	294(100)

F=frequency

Source: Field data (2023)

Table 10 shows that 16 out of 18 teachers representing 88.8% disagreed that students regularly revise the subject before class, while 2(11.1%) teachers agreed to the same statement. Also, 177 students out of 294 representing 60.3% disagreed to the same statement, 15(05.1%) have no opinion, while 102(34.9%) agreed that they regularly revise the subject before class (Table 10).

Concerning students schedule for science study, 16 out 18 teachers representing 88.8% agreed that students have no schedule for Integrated Science, while 2(11.1%) disagreed to the same statement. Also, 186 students out of 294 representing 63.4% agreed, 13(04.5%) have no pinion, while 95(32.1%) disagreed that they do not have schedule for Integrated Science.

Again, on issue relating to personal note taking, 13 out of teachers representing 72.3% disagreed that students take personal notes from lessons for revision, while 5(27.8%) agreed to the statement. On the same statement, 192 students out 294 representing 65.4% disagreed, 22(07.4%) have no opinion, while 80(27.2%) agreed (Table 10).

Furthermore, on issue relating to supplementary reading on Integrated Science, 15 out of teachers representing 83.3% disagreed that students search for supplementary reading material and notes on science, while 3(16.7%) agreed. On the same statement, 215 students out 294 representing 73.1% disagreed to statement, while 79(26.9%) agreed in the schools (Table 10).

Findings on students' learning habit from Table 10

The results in Table 10 indicate that:

- A large number of Integrated Science teachers, 16(88.8%) and a greater number of students, 177(60.3%) perceived that the students do not regularly revise the Integrated Science before classes in the schools.

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- A large number of Integrated Science teachers, 16(88.8%) and greater number of students, 186(63.4%) perceived that students do not have any study schedule for Integrated Science in the schools.

- A large number of teachers, 13(72.3%) and a greater number of students, 192(65.4%) perceived that students do not take personal notes from lessons for revision.

- A greater number of teachers, 15(83.3%) and a greater number of students, 215(73.1%) perceived that students do not search for supplementary reading material and notes on Integrated Science in the schools.

4.3 Interview data on teachers and students perceived factors

The semi-structured interview with the teachers (Appendix D) consisted of 11 items while the student focus group discussion (Appendix E) consisted of 12 items. The entire events of semi-structured interview and student focus group discussion were conducted in English and taped using a voice recorder. After each interview the researcher listened to the tape and transcribed the whole interview which was then typed and also stored on the computer. The data from the interviews were analysed manually to understand the participant's views and experiences as it relates to perceived factors influencing academic performance in Integrated Science. The researcher transcribed the information from the interviews, and these transcripts were then read and important categories were identified. The data were sorted and grouped according to similar codes. This was done to separate the data into workable units (McMillan & Schumacher, 2010). The data were then scrutinized to ascertain how the codes influenced each other, and alternative explanations were searched for. This was done to describe the responses of the respondents, and patterns were sought.

Interviews were conducted with four teachers (one head of science department and one assistant headmaster, academics from each school) and focus group discussion with 12 students who were purposely selected from the two schools. The selected participants were given consent forms to sign before participation, and they were given letter names for purposes of anonymity. The responses were categorised according to three themes, namely environmental factors, teacher quality, and student factors.

4.3.1 Interview data on teachers and students perceived student environmental-related factors

Students' environmental variables include the home, school and community. These are given below:

Home variable

Similarly, blow were the interview data from both students and teachers from the qualitative aspect of the study on the home environmental variables presented. The responses of the students on home variables from the focus group discussion item 2, (Appendix E) indicated that poor homes were perceived to affect their academic performance in Integrated Science because of the fact that their parents were unable to provide learning assistance and afford extra lessons. They had to do chores after school. Their parents were uneducated. Their responses were as follows:

My parents always fight and my mother sent me to her sister who is a trader. She always insists I do household chores before and after school. This is why I performed below average in Integrated Science because I don't get enough time and rest for academic work outside the school.

My parents never bought any reading book for me except what the school distributed.

My parents don't guide and monitor us in the house for studies. When you talk to them about materials for studies, you will be ignored quickly and with frustrations all around, we manage.

My parents' personal computer and smart phones are accessible to all of us in the house anytime. Sometimes we sleep late due to games on the computer or TV programmes. This really affected us because we sleep in class during lessons and did not revise our notes before class.

The responses from teachers' interview on the student's home (Appendix D, item 1a) as immediate environment also were as follows;

Most parents of this area are willing to come when invited, however, they do not understand their role in their children's learning.

Most of the parents did not have formal education so they cannot help their children in doing their school work.

Some parents do not provide time for the learners to do study after school and don't supervise their wards activities at home.

Most of our students relied on the reading materials provided by the school. Those few students whose homes provided the needed support either physically or emotionally, they did well in exams.

Most of our students don't have time for books and it seems they normally overuse their time frivolous things because they come late to school and sleep during lessons.

The statements above indicate that poverty was a challenge for these students. Their parents could only afford the basic resources for school, and could not enhance their children's learning through extra lessons. This left them with the option of relying on their teachers alone and who also did not have enough time to give them extra attention that they need. Further than that at home their study time is allocated to doing chores

which affect their academic performance even though some of the students don't see it as a problem to them but research regards Integrated Science as a subject that needs to be practiced. Also, inability of parents to assist students with school work means that students can only get assistance from their teachers and if they have a challenge at home no one can assist them and this affect student's academic performance in Integrated Science in the schools.

Findings from interview data on home variable

- Almost all students and teachers indicate that poverty was a challenge for these students as their parents could only afford very little in terms of learning resources and others.

- Majority of students and teachers said that most parents were uneducated and could not assist their wards with school work.

- Further than that for some students at home their study time was allocated to doing chores.

- Quite a number of students and teachers indicate that students do not supervise their children's activities well.

School variable

Similarly, the responses of the students to item 3, the school's variables on the guide to student focus group discussion (Appendix E) were as follows:

Our school lacks so many teaching and learning resources such as projectors, computers, books as well as facilities such as enough classroom blocks, science centre, boys' toilet and enough dormitories for students. These inadequate resources and facilities demoralised us sometimes as students and thus affect our academic performance in particularly Integrated Science.

One of problems we faced as students is overcrowding in our various classrooms. The school has insufficient classrooms for the number of students admitted. It negatively affects attention, exercise and above all demotivating many of us in all activities in the school.

The food we eat too is very bad! We take tea without sugar and bread for breakfast most times. Sometimes just gari and red palm oil, Ah! For me all I am thinking is when to go home instead of thinking about books. It's really hurting since we can't concentrate on our studies.

My school has insufficient Integrated Science teachers and textbooks and other relevant science books for us to complement the efforts of teacher-students' interactions. This affects our quest to learn the subject as it discourages us a lot in searching for more detail understanding of a concept taught.

The responses of the students to school's environment indicate that the school variables that affect their academic performance in Integrated Science include inadequate teaching and learning resources, insufficient dormitory and classrooms facilities, and poor dining meals.

The responses from teachers' interview guide on the school variables (Appendix D, item 1b) as the immediate environment were also as follow.

Our school lacks so many teaching and learning resources such as projectors, computers, books as well as facilities such as enough classroom blocks, science centre, boys' toilet and enough dormitories for students. These inadequate resources and facilities to some extent affect students' academic performance in general.

Some of us as Integrated Science teachers are different subject teachers which makes our workload greater than we can do better. Due to this, I don't get enough time for practical investigations but only demonstrations which do not help much.

Our school have been experiencing food shortage on regular basis and it is very difficult to be properly fed once daily. As the saying goes 'A hungry man is an angry man', our hungry students sometimes in class, you don't feel like teaching them.

We have large number of students than every facility available here. Our school have decided to make some incomplete buildings classrooms to absorb some students. This is not safe at all for our students here.

From the responses above, it is clear that the school's variables such as inadequate teaching and learning resources, insufficient facilities for dormitories and classes, inadequate Integrated Science teachers, as well as regular food shortage leading to poor feeding directly affect the performance of Integrated Science in the schools.

Findings from interview data on school variable

- All students and teachers indicate that insufficient teaching and learning resources such as textbooks, computers, projectors and others for science in the schools affect academic performance Integrated Science.

- Majority of students and teachers indicate that the schools have insufficient dormitory and classrooms facilities to facilitate better science learning.

- Majority of students and teachers indicate that the schools faced regular food shortage leading poor dining meals.

- Almost all students and teachers indicate that the schools have woefully inadequate trained Integrated Science teachers.

Community variable

The responses of the students to item 4 on community's effect (Appendix E) indicated that student peers idle talks, copy behaviour syndrome and dirty relationships were variables that affect their academic performance in Integrated Science. Their responses were as follows:

Most of our friends meet for just idle and dating conversation alone for hours. My friend has been doing and she told me will revise but never!

For me my friends depended on me too much and stressed my parents too. So that was my headache until I quit them and concentrate more serious in my study of Integrated Science.

I have a good friend who advise me in terms of difficulties but she doesn't like attending Integrated Science lessons with this mentality of "I am a major science student". As the results, most Integrated Science practical investigations were done in our absent and that negatively affected us in the mostly every semester examination performance.

Many of my friends have boyfriends or girlfriends matters which result in heart-break and they usually fall sick. This is the most frequent cause of girls at the sick-bay while lessons are going on.

These responses of the students indicate that peers' interactions affect them academically.

The responses of the teachers to interview item 1c (Appendix D) indicate that the peers' interest and encouragement in a child's life affect the child's attitude towards school, classroom conduct, self-esteem, punctuality and motivation which consequently affect their academic performance. Their responses were as follows:

When they come fresh, we monitor them and realised through our observations that mostly their friends have influenced them negatively.

Our students influence themselves in so many things around. In fact, the social media have taken this to another level. A level where students want to copy anything without looking to its effect. The good and the bad are copied together thus keeping them too engaged with those frivolous things instead of their academic performance.

Students engage themselves in doing different things instead of simple following the school's schedule. They engage in conversation, idle play and gossips instead of managing their time properly and learning.

Most of our students have genuine issues in terms of their basic needs, friends abuse, pressure when studying among others. We have been advising them on the need to know that life is full of ups and downs, and so they just have to be contempt and move on.

Findings from interview data on community-related variable

- All students and teachers indicate that idle talk leading to poor time management which affect students' academic performance in Integrated Science.

- Majority of students and teachers indicate that the 'copy behaviour syndrome' of students in schools leading to absenteeism instead being in class to study.

- Majority of students and teachers indicate that the students have genuine issues of lack of basic needs creating pressure on supporting friends.

- Almost all students and teachers indicate that the students flirting among themselves in the schools affect students psychologically and hence, Integrated Science.

4.3.2 Interview data on teachers and students perceived teacher-related factors

Interview data from both students and teachers from the qualitative part of the study on the teacher-related variables that affect students' academic performance in Integrated Science in the Jomoro Municipality were as follow:

Teacher quality

The responses of the students to item 5, the teacher's quality variables on the guide to student focus group discussion (Appendix E) were as follows:

We believe that all our teachers have completed universities before coming to teach because they advise us to learn so that we can also be admitted into university for further studies. We however, believe that not all of them have learned all the components of integrated science. In fact, some teachers struggle to teach the other components.

Most of our teachers will come and talk and go without motivating us to participate and learn science. And such teachers get angry when you tell them you did not understand what was taught.

I love physics so much but my Integrated Science teacher doesn't seem to know physics and does not allow us to interact during lessons but just teach and leave. For this I didn't even answer any question from physics in Integrated Science.

My Integrated Science teacher told us she is biology bias and doesn't teach the other aspects well so when she covered the biology aspect, we don't attend her lessons just to avoid her usual contradictions. So many of us couldn't answer most chemistry questions. Yes, it negatively affected our academic performance in the subject.

Also, the responses of the teachers to interview item 2a (Appendix D) indicate that the teacher's qualification in the subject is seriously a problem in both schools and this doesn't give the teachers confidence in their class activities. Their responses were as follows:

Many teachers in our school have their masters in their respective areas and all of us at least have our first degrees.

We have a few trained professionals in the sciences. And this negatively affect students' academic performance in the sciences due to lack of science skills and pedagogy.

In our school, only two teachers are specially trained Integrated Science teachers and all the rest did major courses in either physics, chemistry, biology or agricultural

science. Most of these teachers are bias in their respective subject areas and this posed a challenge to all of us and our students. It really affecting them academically.

In fact, the lack of Integrated Science specials is worrisome in our school. I teach only physics whilst other teachers teach the other aspects which goes against the teaching and learning of the subject as a unit. It makes students see it too broad to be handled by only a teacher and so boring to study.

Findings from interview data on teacher qualification variable

- Almost all students and teachers indicate that lack of integrated knowledge and its pedagogy by teachers affect students' academic performance in Integrated Science.

- Majority of students and teachers indicate that lack of confidence in teaching certain aspects of the subject by teachers affect students' academic performance in Integrated Science.

- Majority of students and teachers indicate that insufficient integrated content knowledge by most teachers teaching the subject affect students in the learning of such integrated subject.

Teaching methodology

Also, the responses of the students to item 5, the teaching methodology variables on the guide to student focus group discussion (Appendix E) were as follows:

My Integrated Science teacher teaching skills is bad. He doesn't vary his style and he will use examples that we don't even understand. I can say that he doesn't bring understanding to some of us in the class and that affect us in our academic performance.

Most teachers teaching Integrated Science move very fast that we don't understand and they will not allow us to talk or ask questions. They will normally come teach and go

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while we are sitting for another aspect teacher to come. It affected us negatively in Integrated Science examinations.

Most of the times, our teachers don't use teaching and learning materials. Sometimes we don't even see what they talked about in class but they will bring it later just to show it to us.

Since form one, we have done very few practical activities in Integrated Science apart from writing activities.

The responses of the teachers to interview item 2b (Appendix D) give the following responses on how teachers' teaching methodology in the subject affects students' academic performance in Integrated Science in the Jomoro Municipality. Their responses were as follows:

For teaching approach, we have been trying student-friendly approaches such as the constructive and inquiry-based learning but it was realised we can't just finish the syllabus with these approaches with our class sizes.

We try to involve all students in our classes but the fact is that we cannot involve all considering their number in a class.

In our school, we don't have any modern instructional materials where technology can be integrated, so we go just traditional while waiting for the resources.

In fact, the classes we handle are more than us and so we don't actually do much of activity-based learning in class. I know that it has a negative consequence on the students.

Findings from interview data on teaching methodology variable

- Almost all students and teachers indicate that teachers use single teaching style always in the delivery of an integrated knowledge which affect students' academic performance in Integrated Science.

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- Majority of students and teachers indicate that lecture method which was the most common teaching method used by teachers affect students' academic performance in Integrated Science.

- Majority of students and teachers indicate that poor contact and poor student involvement by most teachers teaching the subject affect students in the learning of such integrated subject.

Teacher attitude

The responses of the students to item 7, on teachers' attitude of the guide to student focus group discussion (Appendix E) were as follows:

For my class, the teachers are never regular and do not make up for missing periods. Due to this attitude, we were not able to complete the syllabus for the semester before the examination. In fact, we struggle a lot during the examination because our friends were ahead.

As for punctuality, except those who are staying very far from the school sometimes come late to work. This is one of the reasons we were not able to complete the syllabus for the semester before the examination.

Our science teacher knows the subject but he doesn't show us that concern of care and love for us to learn. Those few students who understood, away! He is going forward without attending to the needy and when you make an attempt to ask, you will look bad in that class. So, me I feel neglected whenever he comes into the classroom and even don't take the subject seriously.

Most of our science teachers give only few exercises and don't mark them promptly. Due to this attitude, we were relaxed and hardly prepare for exercise. It really does not help!

The responses of the teachers to interview item 2c (Appendix D) indicate that their attitudes affect students' academic performance in Integrated Science in the Jomoro Municipality. Their responses were as follows:

Some of us stay very far from the school we teach due to issues of accommodation and we depend on motorist. It affects our punctuality and our students learning the subject.

As teachers we must be regular for the contact hours with our students. However, sometimes issues come up as most of us are staying far away from school and the workload among us is such that you can't find a colleague to replace you in class.

I think the student-teacher ratio is also affecting the quality of work we do here as teachers. How can only eighteen teachers handle students' population of three thousand? As a result, feedback to students has never been promptly.

Findings from interview data on teacher attitudinal variable

- Some students and teachers indicate that teacher's absenteeism and failure to make up lost periods affect students' academic performance in Integrated Science.

- Quite a number of students and teachers indicate that lateness by science teachers staying far away from the schools affect students' academic performance in Integrated Science.

- Majority of students indicate that most science teachers are not sensitive to their learning needs and thus affect their academic performance in Integrated Science.

- Most students and teachers indicate teachers give only few exercises due to large student-teacher ratio.

4.3.3 Interview data on teachers and students perceived student-related factors

Interview data from both students and teachers from the qualitative part of the study on the student-related variables that affect students' academic performance in Integrated Science in the Jomoro Municipality were as follow;

Student interest

The responses of the students to item 8 (Appendix E) indicate that the students' interest in the subject affect their academic performance Integrated Science. The student's academic performance is thus influenced by their perceptions and interest in the subject. Their responses were as follows:

Most of the time with some of my friends, we dodged Integrated Science lessons by not attending the class due to the fact that we don't to sit for it. As the result, many topics taught in our absence were not properly answered.

Integrated science is broad, abstract and boring to catch our attention in class just for a period of sixty minutes.

We do not have a science laboratory instruments and I can't remember when we did some practical investigations in Integrated Science, and this theory without practical in the subject is unexciting and normally reduces our interest.

Some of us are not ready to find answers to the many things concerning ourselves in real-life situations. We think science knowledge from whatever source is for the major science students

I think Integrated Science should be learned by science students not visual arts. It was boring, loaded and you need to just be good before you can score good marks. The subject is not friendly to us and so we don't performance well.

The broad aspects of Integrated Science are the reason I don't like the subject. One subject, but you have to attend four lessons, why? It's boring all that, so I just sit don't take part in the activities of the class.

The responses of the teachers to interview item 3a (Appendix D) indicate that the students' interest in the subject affect their academic performance in the subject. Their responses were as follows:

My students come for class when they want and when asked they claimed it is the same thing in their electives but always perform low during assessment

Most of the students sleep during my lessons due to their low level of interest and attention for the subject.

Integrated Science is science basically about the everyday things we do and so must involves practical investigations. However, our school have inadequate instructional materials and instruments for basic scientific practical work that elicit most students' interest toward the scientific and technological knowledge of this fast-developing society.

Integrated Science deals basically about the everyday things we do and so it is an exploration of things through teaching and practical investigations. However, most of our students are not curious, not inquisitive or eager to ask and find answers in science.

In some of my classes I realised most students attached more attention and interest to their electives more than to Integrated Science. This low interest in the subject normally reflect badly in their results.

Findings from interview data on student interest variable

- All students and teachers indicate that student's absenteeism leading to missing contact periods affect students' academic performance in Integrated Science.

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- Almost all students and teachers indicate that lack of curiosity and attention among most students affect their academic performance in Integrated Science.

- Majority of students indicate that the broad aspects nature the subject affect student's academic performance in Integrated Science.

- Quite a number of students and teachers were mostly concerned about the time allocated to the lot of work they had to cover those broad aspects with practical.

Student expectation

The responses of the students to item 9 (Appendix E) indicate that their expectations in the subject affect student's academic performance in Integrated Science. Their responses were as follows:

We expect that Integrated Science will give us enjoyment in its attempt to provoke and provide answers for most of the recent technological advancements which interest us a lot. But its content is broad and abstract quite in most parts.

We the students expect practical works relating to technology more in Integrated Science concerning things interesting to us but the lack of resources and the formal structure teachers have to follow don't allow us to often do real expected practical work instead, we do more of science demonstrations.

I used to like Integrated Science as I have got high expectation concerning it but my friends negatively influenced me towards science due to the fact that we don't have resources for practical investigations and since then my feelings for science has been bad.

We have learned Integrated Science throughout primary and junior high schools and it has been always been the same. More effort should rather go to subjects we have not learned before this time.

The responses of the teachers to interview item 3b (Appendix D) indicate that most students have high expectations in the subject but were not sustained. The responses showed that many students lost their expectations for Integrated Science as a core science. Their responses were as follows:

Integrated Science provides students with the integrated knowledge required for better understanding of real-life issues. However, most of our students do not show any commitment to receiving the enjoyment integrated science knowledge provides because they felt it is loaded and abstract.

Integrated Science concerns basically about the everyday things we see and do relating to science and technology that are well structured. However, most of our students think that its practicality should go only their way of expectations otherwise, its investigations waste their time and turn low for the few practical sessions.

In most times when teaching, I do observe that most students have no passion for the subject for it is difficult to see their eagerness for the subject except for some specific things expected at this level told by their former science teachers and others.

Most students think that Integrated Science as a natural science should not trouble their minds in any of its attempt in offering explanation to natural events. This however is not how science work but it involves thought provoking.

Findings from interview data on student expectation variable

- All students and teachers indicate that students expect more practical work that relate to technology in the society which was limited more of science demonstrations.

- Almost all students and teachers indicate that students expect enjoyable thought provoking, questions and answers recent technological advancement which was not.

- Majority of students and teachers indicate that unsustainable high expectations of students due to loss of passion from peers' influence.

- Some students and teachers were mostly concerned about the student expectation that Integrated Science has always been the same which led to lack of commitment and neglect.

Student learning habits

The responses of the students to item 10 (Appendix E) indicate that students have bad learning habits towards Integrated Science as a core science. Their responses were as follows:

I don't get time for Integrated Science due to loads of engagement every day. This has been my problem with Integrated Science performance because, it's broad and gives me headache as it demands thorough and constant learning.

We don't have or follow any guide for our studies. We study constantly what subject the teacher punishes us for low performance when assessed. I study Integrated Science for exams.

We don't get any motivation for Integrated Science studies. It is like we have learned the same things in our junior high schools.

We actually do not write personal notes from the teachers and other sources because we think we have textbooks and pamphlets that we cannot even learn. During exams, most of us were asking ourselves where specifically to revise and it did not help us good at all.

From the responses above, it is clear that students' learning approach towards the subject generally was bad.

The responses of the teachers to interview item 3c (Appendix D) indicate that the students' learning habits in the subject is nothing to run home about. The responses showed that many students have very bad learning approaches to Integrated Science particularly as follows:

What I realised happening is that, most students are suffering with low self-discipline and do occupy themselves with several distractions. We advise them every day and we have seen some have changed and are doing better in the science now.

Most of my students do not have any plan that guides their study and so you see them busy but for nothing. The situation here is worrisome in fact for the subject.

My students in some cases have to be forced to come for Integrated Science lessons. Their show of no interest in the subject sometimes makes me bore as a teacher but we are still forcing.

Most students don't take notes for whatever they learn either during class interaction or personal studies. Consequently, they have nothing to revise before class. When asked what was taught the day before, as if they were never taught. This is not helping in the study of the subject at all.

Findings from interview data on student learning habit variable

- Most students and teachers indicate that students poor time management for science affect their science learning.

- Almost all students and teachers indicate that students lack study schedule for Integrated Science which hinder effect learning.

- Majority of students and teachers indicate that most students do not take or make personal notes on the subject.

- Some students and teachers were mostly concerned too about lack of motivation and discipline on the part of students toward learning Integrated.

4.4 Discussion of the findings

The study aimed to reveal students and teachers perceived factors that affect students' academic performance in Integrated Science in the Jomoro Municipality of the western region of Ghana. The factors that were investigated in the study include, the students' environment (home, school and community), the teacher's quality (qualification, teaching methodology and teacher's attitude), and the students' characteristic (interest, expectations and learning habits). These factors were investigated in different approaches in order to establish if they contribute towards influencing the academic performance of the students in Integrated Science in the Jomoro Municipality. The findings of the study were discussed in line with the research questions that guided the study below.

Research Question 1

What are the teachers and students perceived students' environmental-related factors affecting students' academic performance in Integrated Science in senior high schools in the Jomoro Municipality?

Research question one sought to determine the environmental factors of student home, school and community which teachers and students perceive to affect students' academic performance of senior high school students in Integrated Science

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4.4.1 The Immediate Environment

Student immediate environment in this this study is the primary context to which the students relate and interact. The immediate environment of the student in the study includes their home, their school and their community. The findings on the perceived factors of immediate environment on the students' academic performance are discussed below;

4.4.1.1 The home environment

According to Khan, Begum, and Imad (2019) home is the first institution of a child that has significant relationships with students' overall life, and that affect the student's education and living. A variety of aspects were investigated in relation to the home environment. The findings of this study show that both students and their teachers perceived (Table 2) that student home environment affect their academic performance in Integrated Science. Both students and teachers in their responses argue that poverty was a challenge for most of these students as their parents could only afford very little in terms of basic and learning resources needs as most parents were uneducated, unemployed and could not assist their wards with school work.

With regard to home environment variables, most students and most teachers perceived that students' home environments were not conducive for the studies of Integrated Science (77.2% & 83.3% respectively, Table 2); most parents were uneducated (63.4% & 100% respectively, Table 2); student parents do not effectively involve in the progressive activities of their children in schools (55.1% & 88.9%, Table 2); and student parents do not supervise the activities of children well (77.2% & 94.4% respectively, Table 2).

With regard to this issue, this is how students and teachers responded in the interview;

S*: My parents never bought any reading book for me except what the school distributed. And most of the time I depend on kind friends for survival while in school. They do not have formal education nether do they have job*

T1: *Most of the parents did not have formal education so they cannot help their children in doing their school work and some do not provide time for the children to do work after school.*

S*: My parents' personal computer and smart phones are accessible to all of us in the house anytime. Sometimes we sleep late due to games on the computer or TV programmes. This really affected us because we sleep in class during lessons and did not revise our notes before class.*

T2: *Most of our students don't have time for books and it seems they normally overuse their time for frivolous things because they come late to school and sleep during lessons.*

S*: I do household chores before and after school. This is why I performed below average in Integrated Science because I don't get enough time and rest for academic work outside the school.*

This means that student home environment consisting of both physical and human resources affect the living condition of students in school. Rich and stimulating home environment are directly linked with family income, economic and educational status of the parents, nature of family, authority (head of family) and attitude of parents towards children (Khan, Begum & Imad, 2019). When the findings obtained in relation to the home environment is examined, it is seen that uneducated parents who are poor lack good parenting style, lack the ability to control and maintain healthy family for better development of the children. Most students come from under-resourced homes with uneducated parents (Table 2; see the responses in the interviews with the teachers

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and the students). This led to a lot of irresponsibility on the part of the parents to the negligence of the children. As a result, most students have to work extra in their homes and outside for survival. Findings of this study show that poor parenting style provide unconducive homes for studies and negatively affected students' academic performance in Integrated Science. Further than that for some students at home their study time was allocated to doing chores and others have unregulated access to television every time at home. Therefore, unconducive home environment of students affects their academic performance in Integrated Science the schools.

When the findings of the study are compared with similar research findings, it is seen that the finding correlates with studies such as Muema, Mwanza, and Mulwa (2020), and Nbina (2012) whom state that the home is the aspects of people's domestic lives that contribute to their living condition. Barnard (2004) stated that academic performance of students heavily depends upon the parental involvement in the academic activities of their wards for higher level and quality in academic success. Students with more educated parents from home who value science highly tend to exhibit higher academic achievement scores since such attitude is an important factor (Juan & Visser, 2017). Bozzola et al (2022) state that electronic media devices have adverse consequences among the most vulnerable people such as the youth including problems of sleep, addictions and anxiety, behavioural problems, depression, and psychological problems. The reporters add that psychological problems had a strong impact on mental health of adolescents causing change in routine, daily activities and habitual lifestyles. Razel (2001) indicated that with a small amount of TV-watching, academic achievement increased with viewing, but beyond a certain point of watching, achievement decreased in all examined age groups. Easy accessibility can often lead to overconsumption and by the change in television programmes, competition for

consumers, on-demand streaming, series and movies are no longer portioned accessible by a strict television programme, but accessible all the time and everywhere. Hence, low education status of parents, low economic status, and poor parenting styles provide unconducive home environment were perceived to negatively affects students' academic performance in Integrated Science.

4.4.1.2 The school environment

School environment refers to the learning environment which includes all the facilities and infrastructure available at the place where the school is located and all that can be found within the school surroundings (Kihwele, 2014). A variety of aspects were investigated in relation to the school environment. The findings of this study show that both students and their teachers perceived (Table 3) that student school environment affect students' academic performance in Integrated Science. Both students and teachers in their responses argue that inadequate facilities and insufficient teaching and learning resources were mostly their challenge in their schools.

With regard to school environment variables, most students and most teachers perceived that schools have inadequate classrooms for the studies of Integrated Science (55.1% & 83.3% respectively, Table 3); insufficient reading and learning resources (53.8% & 72.2% respectively, Table 3); inadequate teaching and learning resources (75.3% & 100.0%, Table 3); and poor dining meals (60.2% & 55.5% respectively, Table 3).

With regard to this issue, this is how students and teachers responded in the interview;

S*: One of problems we faced as students is overcrowding in our various classrooms. The school has insufficient classrooms for the number of students admitted. It negatively affects attention, exercise and above all demotivating many of us in all activities in the school.*

T1*: We have large number of students than every facility available here. Our school have decided to make some incomplete buildings classrooms to absorb some students. This is not safe at all for our students here.*

S*: The lack of sufficient classrooms makes most of us to miss or dodge classes. We don't have permanent classrooms so we can have our peace of mind to study. It affects our time management and discourages us a lot and hence, negatively affect our academic performance in Integrated Science.*

T3*: If you check in our library, only a handful of Integrated Science textbooks are available for almost three-hundred thousand students. This does not help effective academic work.*

S*: My school has insufficient Integrated Science textbooks and other relevant science books for us to complement the efforts of teacher-students' interactions. This affects our quest to learn the subject as it discourages us a lot in searching for more detail understanding of a concept taught.*

T2: *Our school lack so many teaching and learning resources such as projectors, computers, books. These inadequate instructional resources to some extent affect students' comprehension and consequently, academic performance in general.*

S*: Our school has issues of inadequate instructional resources such as such as projectors, realia and ICT tools for deep, clear and memory touching lessons as well as for self-pace learning.*

T4*: Our school have been experiencing food shortage on regular basis and it is very difficult to be properly fed once daily. As the saying goes 'A hungry man is an angry man', our hungry students sometimes in class, you don't feel like teaching them.*

S*: The food we eat is very bad! We take tea without sugar and bread for breakfast most times. Sometimes just gari and red palm oil, Ah! For me all I am thinking is when to go*

home instead of thinking about books. It's really hurting since we can't concentrate on our studies.

This means that this multidimensional construction that include the physical, social and the academic measures affect students in different ways. Students and teachers of schools with inadequate facilities are likely to fail in perceiving a clear focus on academic purposes and the learning environment and such is likely to influence learning processes that take place (Carbonaro, 2005). The responses indicate that the study schools have woeful inadequate facilities and resources for science learning. The insufficient classrooms' space is worrisome to both teachers and students as overcrowding classrooms and frequent search for classroom negatively affect their academic performance in Integrated Science. Reading materials are very important in that they support students' understanding of new words through illustrations, encourage discussion, visual and critical thinking skills, knowledge among others. Students in the study schools don't get enough complementary reading materials to widen their scope of understanding and increase in their love for the subject. Schools under study have inadequate teaching and learning materials to make learning interesting and easy for students as they enable teachers to easily express concepts. Furthermore, poor meals served to students affect their wellbeing and hence their academic performance in Integrated Science. This is because food is eaten for vital purposes such as health, comfort, stability, strength and sound mind etc to an individual. Students and teachers indicate that the schools faced regular food shortage leading to poor dining meals. If the person eats what cannot be eaten, it affects all the aforementioned eating purposes and work.

When the findings obtained in relation to the school environment is examined, it is seen that the finding correlates with studies by Dizaj, and Khanghahi, (2021) and Carbonaro

(2005) who revealed that the physical structures of the school can influence students' attachment and commitment in all school activities and academic performance. Owoeye, and Yara (2011) established that reading and learning materials enable the students to develop problem-solving skills and scientific attitudes. Duran-Narucki (2008) which state that schools with appropriate pertinent instructional materials enrich students with deep conceptual and memorable understanding. A study by Amedeker (2020) revealed that the integration of Information and Communication Technologies (ICTs) in science instruction positively affected examination in science in Ghana. Weinreb et al (2005) demonstrate that students who are at risk for hunger are more likely to have attention and behavioural issues and are less likely to perform well in school since feeding alleviates hunger and improves memory and test performance. Hence, inadequate classroom space, inadequate teaching and learning resources as well as poor and insufficient meals were perceived to negatively affect academic performance of students in Integrated Science.

4.4.1.3 The community

Community is a social unit with a shared socially significant characteristic such as place, set of norms, culture, religion, values or identity (Merriam-Webster dictionary.com). A variety of aspects were investigated in relation to student's community. The findings of this study show that both students and their teachers perceived (Table 4) that student community's influence affect their academic performance in Integrated Science. Both students and teachers in their responses indicate that student's community influence each other relative to their decision-making and general behaviour towards class attendance and learning in their schools.

With regard to student community variables, most students and most teachers perceived that students' peer-group interest affect their class attendance and the studies of

Integrated Science (65.4% & 66.7% respectively, Table 4); students' reaction to ethnicity negatively affect their learning (77.3% & 88.9% respectively, Table 4); students' socio-economic dependence influences negatively their conduct and behaviour (72.1% & 77.8%, Table 4); and student-peer class interactions influence positively good academic behaviour in the schools (68.2% & 77.8% respectively, Table 4).

With regard to this issue, this is how students and teachers responded in the interview;

T1*: When they come fresh, we monitor them and realised through our observations that mostly their friends have influenced them negatively.*

S*: I have a good friend who advise me in terms of difficulties but she doesn't like attending Integrated Science lessons with this mentality of "I am a major science student". As a result, most Integrated Science practical investigations were done in our absence and that negatively affected us mostly in every semester examination performance.*

S*: Some of our friends always want us to provide most of their needs in school. They will want to use your book, pen, calculator when you also need them. It's really a burden and affected my performance because these they interfered with my studies.*

T2*: Most students report to school without some basic necessities and this is worrisome. Students do report without mathematical set among others under the watch of their parents.*

S*: Many of my friends have boyfriends or girlfriends matters which result in heart-break and they usually fall sick. This is the most frequent cause of girls at the sick-bay while lessons are going on.*

T3*: Most of our students have genuine issues in terms of their basic needs, friends abuse, pressure when studying among others. We have been advising them on the need to know that life is full of ups and downs, just be contempt and move on.*

S: *Most of our friends meet for just idle and dating conversation alone for hours. My friend has been doing and she told me will revise but never!*

T4*: Students engage themselves in doing different things instead of simple following the school's schedule. They engage in conversation, idle play and gossips instead of managing their time properly and learning.*

This means that peers' interest, likes and other lifestyles affect the students' attitude towards school, classroom conduct, self-esteem, attendance and motivation. Peer influence refers to those interpersonal factors present in the immediate or potential learning environment (Borsari & Carey, 2001). Student peers influence each other relative to their decision-making, interactions and their general behaviour toward Integrated Science which determines classroom conduct, attendance, punctuality and motivation which consequently affect their academic performance. Most students over-depend on other students for almost everything in the schools which creates burden and disturbs peers' studies. This is because peers' demand and dependence among student's life affect their learning schedule, habit, and interest which consequently affect their academic performance. Again, peers flirting among boys and girls results in psychological unstable among most students in various forms in the schools. Students' psychological instability creates unstable minds and hinder effective studies which and negatively affect the academic performance of students in Integrated Science. Some students unnecessarily delayed and put off tasks until last minute due to peers' interactions and hence, its negative effect on academic performance. This student peer procrastination delays task schedule and reduce effective studies duration.

When the findings obtained in relation to the student community is examined, it is seen that the finding correlates with studies such as Giuliodori, Lujan, and DiCarlo (2006) and Rangvid (2003) whom have shown that through peer interaction, students developed certain bad behaviour such as skipping classes that negatively affect their academic performance. Mosha (2017) investigated the influence of peer group on adolescent students" academic performance in secondary schools in Tanzania and established that peer's relationship had a great influence in determining students" academic performance. It was found that issues of family negligence may trigger behaviour among peers paying less time on school work (Okoedion, Okolie & Udom, 2019). McKenzie, and Schweitzer (2001) stated that psychological factors affect students' academic performance and lack of student's self-respect, discipline and effort affect students' academic performance (Alani & Hawas, 2021). Hence, 'copy behaviour syndrome', psychological unstable, overdependence, procrastination due to idle talks with peers in the schools were perceived to negatively affect academic performance of students in Integrated Science.

Research Question 2

What are the teachers and students perceived teacher-related factors affecting students' academic performance in Integrated Science in senior high schools in the Jomoro Municipality?

Factors that were included are teacher's qualification, methodology and the attitude towards Integrated Science among adequacy of professional Integrated Science teachers.

Research question two sought to determine the teacher-related factors which teachers and students perceive to affect students' academic performance of senior high school students in Integrated Science

4.4.2 The teacher quality

Teacher quality refers to the professional practice and accountability of one's frameworks, standards and all rubrics encompassing those skills and capabilities of expertise and performance (Bradford, Pendergass & Grootenboer, 2021). Spaull (2013) says that, "The quality of education cannot exceed the quality of a teacher" (p. 24). Teacher's quality in this study includes the qualification, teaching methodology and the teacher's attitude as discussed below;

4.4.2.1 Teacher qualification

In this study, teacher's qualification refers to the level of professional training that a teacher possesses in respect of a subject of study. The quality of academic and professional development of teachers had during the pre- and in-service training have great effect on their performance and on students' academic performance (Hailu & Jabessa, 2010).

A variety of aspects were investigated in relation to the teacher's qualification. The findings of this study show that both students and their teachers perceived (Table 5) that teacher academic qualification, professional qualification, subject teaching qualification, and knowledge of integrated subject were the perceived factors affecting academic performance in Integrated Science in their schools.

With regard to student peer variables, most students and most teachers perceived that teachers' academic qualification affects students in Integrated Science (67.1% & 94.4% respectively, Table 5); that teacher's low confidence in teaching negatively affects students (76.1% & 100%, Table 5); there were inadequate professional Integrated Science teachers in the schools for students (53.5% & 100% respectively, Table 5) and that holistic subject matter positively affects learning in the schools (68.2% & 55.6% respectively, Table 5).

With regard to this issue, this is how students and teachers responded in the interview;

T1*: Many teachers in our school have their masters in their respective areas and all of us at least have our first degrees.*

S*: We believe that all our teachers have completed universities before coming to teach because they advise us to learn so that we can also be admitted into university for further studies. We however, believe that not all of them have learned all the components of integrated science. In fact, some teachers struggle to teach the other components.*

T4*: We have a few trained professionals in the sciences. And this negatively affect students' academic performance in the sciences due to lack of science skills and pedagogy.*

S*: Most of our teachers will come and talk and go without motivating us to participate and learn science. And such teachers get angry when you tell them you did not understand what was taught.*

T2*: In our school, only two teachers are specially trained Integrated Science teachers and all the rest pursue courses in either physics, chemistry, biology, agricultural science or others. Most of these teachers are bias in their respective subject areas and this posed a challenge to all of us and our students. It really affecting our students negatively.*

S*: I love physics so much but my Integrated Science teacher doesn't seem to know physics and does not allow us to interact but just teach and leave. For this I didn't even answer any question from physics in Integrated Science.*

T3*: In fact, the lack of Integrated Science specials is worrisome in our school. I teach only physics whilst other teachers teach the other aspects which goes against the*

teaching and learning of the subject as a unit. It makes students see it too broad to be handled by only a teacher and so boring to study.

S*: My Integrated Science teacher told us she is biology bias and doesn't teach the other aspects well so when she covered the biology aspect, we don't attend her lessons just to avoid her usual contradictions. So many of us couldn't answer most chemistry questions. Yes, it negatively affected our academic performance in the subject.*

This means that although most teachers teaching the subject have acquired good levels of academic qualifications for teaching, only very few have the required academic qualifications in respect of the subject Integrated Science. This situation did not help the students learning Integrated Science in the schools because with the required academic qualification in terms of the subject, the teacher has command over the subject's components and easily delivers the knowledge holistically for easy understanding. Also, the lack of professional qualification of most teachers in Integrated Science really have been a factor negatively affecting student learning it. This is because, it results in lack of the required integrated knowledge and its teaching pedagogical skills in the subject for effective delivery. This creates low confidence in teaching certain aspects of the subject and because its language, method, concepts are never properly communicated. Teachers who are not specifically trained for Integrated Science teaching find it difficult to properly integrate the various components of the subject very well.

When the findings obtained in relation to the teacher qualification is examined, it is seen that the study relates with studies by Ncube, (2013) who state that the way students perceived teachers in terms of their knowledge of the subject matter significantly affects them in their learning about that subject. This is because the teachers' knowledge of the science subject is an absolute requirement to create a future-oriented learning

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environment (Parmin, Saregar, Deta & El-Islami, 2020). Teachers in secondary school positively affect the academic performance of students if their professional qualification in the specified field of study was intact (Thomas & Olugbenga, 2012; Alan & Hawas, 2021). Winarno, Rusdiana, Riandi, Susilowati, and Afifah, (2020) where they lamented on how most Integrated Science teachers in Indonesia still emphasise one subject instead of integrated multiple subjects and its negative effect on academic performance. Hence, lack of required professional qualification of teachers in Integrated Science which result in low confidence in teaching, lack of integrated knowledge of the subject and lack of appropriate pedagogical skills in Integrated Science were perceived to negatively affect academic performance of students in Integrated Science

4.4.2.2 Teacher methodology

For teaching methodology, the success of science teaching and learning process largely depends on the choice of the teacher's teaching methods.

A variety of aspects were investigated in relation to the teacher's methodology. The findings of this study show that both students and their teachers perceived (Table 6) that teaching styles and approaches, students' involvement, effective use of TLMs, and activity-base were the perceived factors affecting academic performance in Integrated Science in their schools.

With regard to student peer variables, most students and most teachers perceived teachers' do not vary teaching styles and approaches in class for students (62.2% & 50.0% respectively, Table 6); that students were engaged in the teaching and learning process (45.9% & 66.6%, Table 6); there teachers do not use different but appropriate teaching and learning materials during lessons (70.8% & 100% respectively, Table 6)

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and that that teachers do not identify students with problems and assist them individually in the schools (68.9% & 100% respectively, Table 6).

With regard to this issue, this is how students and teachers responded in the interview;

T1: *For teaching approach, we have been trying student-friendly approaches such as the constructive and inquiry-based learning but it was realised we can't just finish the syllabus with these approaches with our class sizes.*

S: *My Integrated Science teacher teaching skills is bad. He doesn't vary his style and he will use examples that we don't even understand. I can say that he doesn't bring understanding to the class and that negatively affected us in academic performance.*

T2: *We try to involve all students in our classes but the fact is that we cannot involve all.*

S: *Most teachers teaching Integrated Science move very fast that we don't understand and they will not allow us to talk or ask questions. They will normally come teach and go while we are sitting for another aspect teacher to come. It affected us negatively in Integrated Science examinations.*

T3: *Our schools do not have enough teaching and learning materials for science. So, we manage the few ones with their related topics and noticed they helped a lot in enhancing understanding.*

S: *Most of the times, our teachers don't use teaching and learning materials. Sometimes we don't even see what they talked about in class but they will bring it later just to show it to us.*

T4: *In fact, the classes we handle are more than us and so we don't actually do much of activity-based learning in class. I know that it has a negative consequence on the students.*

S: *Since form one, we have done very few practical activities in Integrated Science apart from writing activities.*

This means that most teachers do not use the appropriate teaching approaches in their teaching of Integrated Science. Teachers need to employ variety of teaching strategies to maximise learning in the classroom and when this is not employed, it negatively affects student learning Integrated Science. Students' involvement is the act of engaging students fully as partners in every facet of the learning process in order to increase their attention and fucus with high-level of critical thinking. If teachers do not commit to involving students in the learning process, most students will be left out in the process and will be negatively affected in their academic performance in Integrated Science as they are not stimulated and motivated. Teaching and Learning Materials (TLMs) are simply real objects or improvised use as aid in the teaching and learning process. As most teachers do the lecture method since they hardly use TLMs in their teaching, such lessons are not interesting and engaging, hence, negatively affect students learning Integrated Science. Teachers do not usually use activity-based science learning and this does not make lesson interesting, engaging, mind stimulating and critical thinking. hence, negatively affect students' academic performance in Integrated Science. Activity-based learning is a teaching methodology where the concept of subject matter is delivered through various activities such as carefully-designed individual learning activities as well as those for groups to make learning more interesting and engaging.

When the findings obtained in relation to teacher methodology is examined, it is seen that the study correlates with studies such as William, Brule, and Kelly (2018) whom state that the success of science learning is achieved through the teachers' ability to use the appropriate approaches and tools to develop their work as a result of applying the

concepts. Students' cognitive stimulation, interest, and motivation are do affect their learning (Marijoribanks, 2007; Edward, Ayuba & Felicia 2017; Abiodun, 2020) and all these are aroused when students are properly and fully involved in the learning process. Instructional materials, and instructional strategies used by teachers contribute to students' academic performance (2008; Azure, 2015, Edward, Ayuba & Felicia, 2017; Safo-Adu, Ngman-Wara & Quansah, 2018). Quansah, Sakyi-Hagan, and Essiam (2019) state that when students are involved in science activities with the materials, they understand scientific concepts better and ultimately improve their academic performance.

Hence, the inappropriate teaching approaches used by some, the lack of students' involvement by some teachers, the insufficient and inappropriate used of TLMs by some teachers as well as absence of activity-based learning were perceived to negatively affect academic performance of students in Integrated Science.

4.4.2.3 Teacher attitude

Attitude is a habitual reaction of one's perception of object, situation and other aspects of life encountered in a certain way (Tudor, Pennington & McDowell, 2010). Positive attitude leads to approaching and likeness while negative attitude leads to detachment and disliking (Budiarti, Sari, Wiza & Putri, 2020). It was indicated that teacher's attitude, action and decision determine the interest and love of students towards the subject (Jena, 2015).

A variety of aspects were investigated in relation to the teacher's attitude. The findings indicated that teachers' punctuality, teachers' regularity, teachers' sensitivity, and teachers' laziness were perceived affect students' academic performance in Integrated Science.

With regard to student peer variables, some students and most teachers perceived that teachers were regular for all science lessons in class (46.3% & 55.5% respectively, Table 7); that teachers are sensitive and easily approachable to students during lessons (47.8% & 61.1%, Table 7); teachers come often late for science lessons (54.0% & 100% respectively, Table 7) and teachers do not give prompt feedback to students on academic progress in the schools (52.1% & 55.5% respectively, Table 7).

With regard to this issue, this is how students and teachers responded in the interview;

T1*: Some of us stay very far from the school we teach due to issues of accommodation and we depend on motorist. It affects our punctuality and our students learning the subject.*

S: *As for punctuality, except those who are staying very far from the school sometimes come late to work. This is one of the reasons we were not able to complete the syllabus for the semester before the examination.*

T2*: As teachers we must be regular for the contact hours with our students. However, sometimes issues come up as most of us are staying far away from school and the workload among us is such that you can't find a colleague to replace you in class.*

S*: For my class, the teachers are never regular and do not make up for missing periods. Due to this attitude, we were not able to complete the syllabus for the semester before the examination. In fact, we struggle a lot during the examination because our friends were ahead.*

S*: Our science teacher does not allow us to ask questions or ask him to repeat something for us. His hand writings on the board sometimes are not clear but we keep quiet and copy anything you can see.*

S*: Our science teacher knows the subject but he doesn't show us that concern of care and love for us to learn. Those few students who understood, away! He is going forward*

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without attending to the needy and when you make an attempt to ask, you will look bad in that class. So, me I feel neglected whenever he comes into the classroom and even don't take the subject seriously.

T3*: I think the student-teacher ratio is also affecting the quality of work we do here as teachers. How can only eighteen teachers handle students' population of three thousand? As a result, feedback to students has never been promptly.*

S*: Most of our science teachers give only few exercises and don't mark them promptly. Due to this attitude, we were relaxed and hardly prepare for exercise. It really does not help!*

This means that some teachers were not punctual for science lessons and this may weaken the interest and momentum students gathered for the lesson as a result of disappointments and thus, negatively affect their performance. This is because punctuality is the quality or habit of adhering to an appointed time with the students. Some teachers were not also regular for science lessons and this resulted in some students lagging behind in terms of coverage. Again, some teachers were insensitive to most students' needs and feelings during lessons due to the fact that most teach Integrated Science as an added subject. Such teachers have to allocate among different subject for lesson preparation and usually fully concentrated on their major subjects and this result in their insensitivity and hence, negatively affect students' academic performance. Moreso, some teachers with attitude of laziness give only few exercises and hardly mark them promptly to give feedback to students on their work. This affect planning for progress and thus negatively affect academic performance.

When the findings obtained in relation to the teacher attitude is examined, it is seen that the study correlates with studies such as Yang (2004) and Obeta (2014) whom revealed that lack of punctuality on the part of teachers have negative impact on the students'

academic performance. Yang (2004) indicated that teachers not showing up for lessons negatively affect students' academic performance in the subject. The author adds that if the teacher fails to appear for classes, then the interest of the students in the subject is already lost and that may result in not paying attention at all. Teachers who possess social and emotional competence, who create a warmer classroom atmosphere with an instructional quality, who feel responsible towards their students, who establish supportive and cooperative relations, who regularly communicate with school managers and colleagues, and who display a sensitive approach to students increase their students' academic performance (Caprara, Barbaranelli, Steca & Malone, 2006; Jennings & Greenberg, 2009). Finally, Ncube (2013) identified laziness and increased absenteeism among teachers as some attitudes which compromise quality education in Zimbabwe. The result of laziness will be that the students may not like the teacher and the subject as well in the future (Yang, 2004), and its impact on academic performance. Hence, the late respond to time by some teachers, teachers' irregularity for science lessons, teachers' insensitiveness to students and teachers' laziness in terms of work were perceived to negatively affect academic performance of students in Integrated Science.

Research Question 3

What are the teachers and students perceived student-related factors affecting their academic performance in Integrated Science in Senior High Schools in the Jomoro Municipality?

Factors that were included are interest in the subject, expectations and learning habits towards Integrated Science among students in Senior High Schools in the Jomoro Municipality.

Research question three sought to determine the student-related factors which teachers and students perceive to affect students' academic performance of Senior High School students in Integrated Science

4.4.3 Student related variables

The student-related variables in this study include their interest in the subject, expectations and learning habits. The findings indicated that student related factors such as interest toward the subject, expectations and learning approach directly affect students' academic performance in Integrated Science in the Senior High Schools in the Jomoro Municipality.

4.4.3.1 Student interest in science

Interest refers to a sense of concern with and curiosity about something. It involves the power of holding one's attention for something or exciting the curiosity of something. The importance and role an interest in whatever a person does cannot be underestimated (Adeyemo, 2005).

A variety of aspects were investigated in relation to the students' interest. The findings indicated that class attendance, students' involvement, students' workability, and students' time with the subject were the perceived factors affecting academic performance in Integrated Science.

With regard to student interest variables, some students and most teachers perceived that students class attendance for Integrated Science lessons was bad (55.1% & 83.3% respectively, Table 8); students do not actively involved in all activities of learning science in the schools (52.5% & 88.9%, Table 8); students do not do exercises and assignment promptly (52.5% & 72.3% respectively, Table 8) and students devote no time for studying Integrated Science in the schools (75.3% & 100.0% respectively, Table 8).

With regard to this issue, this is how students and teachers responded in the interview;

T1*: My students come for class when they want and when asked they claimed it is the same thing in their electives but always perform low during assessment.*

S*: Most of the time with some of my friends, we dodged Integrated Science lessons by not attending the class due to the fact that we don't to sit for it. As the result, many topics taught in our absence were not properly answered.*

T2*: Most of the students sleep during my lessons due to their low level of interest and attention for the subject.*

S*: Integrated science is broad, abstract and boring to catch our attention in class just for a period of sixty minutes.*

S*: We do not have a science laboratory instruments and I can't remember when we did some practical investigations in Integrated Science, and this theory without practical in the subject is unexciting and normally reduces our interest.*

T3*: Integrated Science is science basically about the everyday things we do and so must involves practical investigations. However, our school have inadequate instructional materials and instruments for basic scientific practical work that elicit most students' interest toward the scientific and technological knowledge of this fast-developing society.*

T4*: Integrated Science deals basically about the everyday things we do and so it is an exploration of things through teaching and practical investigations. However, most of our students are not curious, not inquisitive or eager to ask and find answers in science.*

S*: Some of us are not ready to find answers to the many things concerning ourselves in real-life situations. We think science knowledge from whatever source is for the major science students.*

This means that some students missed class attendance for Integrated Science lessons which resulted from lack of interest in Integrated Science due to lack of concern or curiosity. The student's attendance is an important factor in his or her grade. Students low class involvement was also a real issue due to their thinking of science as abstract, difficult, boring and uninteresting subject. If science presented is not as exciting as supposed to students, their feeling of excitement for science may not be aroused and this negatively affect students' involvement in class. Most students do not show inquisitiveness in the learning of the Integrated Science and this does not help in science learning.

When the findings obtained in relation to the students' interest is examined, it is seen that the finding correlates with studies such as Giuliodori, Lujan, and DiCarlo (2006) and Rangvid (2003) whom have shown that students' bad behaviour among particularly absenteeism or ineffective class attendance due to lack of interest negatively affect their academic performance. Ogunkola, and Samuel (2011) that students do not fully involve in Integrated Science lessons due to their thinking of science as abstract, difficult, boring and uninteresting subject. Adeyemo (2005) stated that students' interest and excitement in a subject make them learn it or want to learn it naturally. Adeyemo (2005) adds that the source of the student's intrinsic motivation and interest holds so much power for deepening engagements and creating meaningful learnings.

Hence, poor class attendance by some students, the students low class involvement, the lack of students' enthusiasm and the lack of students' curiosity in the subject were perceived to negatively affect academic performance of students in Integrated Science.

4.4.3.2 Student expectation in science

Expectation is a strong hope or belief that students have of their courses will happen (Wade & Reed, 2006) and is viewed as a satisfaction model (Khan & Hemsley-Brown, 2021).

A variety of aspects were investigated in relation to the student expectation in science. The findings indicated that subject enjoyability, subject practicability, students' attachment, and students' easiness with the subject were the perceived factors affecting academic performance in Integrated Science.

With regard to student expectation variables, most students and most teachers perceived that the students do not expect enjoyable science lessons for life in the schools (65.8% & 83.3% respectively, Table 9); expect to do more science practical investigations on some topics in the schools (72.3% & 61.2%, Table 9); students expect the schools to provide all learning resources accessible to students (54.9% & 66.7% respectively, Table 9) and students expect to pass Integrated Science with ease.in the schools (52.9% & 83.3% respectively, Table 9).

With regard to this issue, this is how students and teachers responded in the interview;

T1*: Integrated Science provides students with the integrated knowledge required for better understanding of real-life issues. However, most of our students do not show any commitment to receiving the enjoyment integrated science knowledge provides because they felt it is loaded and abstract.*

S*: We expect that Integrated Science will give us enjoyment in its attempt to provoke and provide answers for most of the recent technological advancements which interest us a lot. But its content is broad and abstract quite in most parts.*

T2*: Integrated Science concerns basically about the everyday things we see and do relating to science and technology that are well structured. However, most of our*

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students think that its practicality should go only their way of expectations otherwise, its investigations waste their time and turn low for the few practical sessions.

S*: We the students expect practical works relating to technology more in Integrated Science concerning things interesting to us but the lack of resources and the formal structure teachers have to follow don't allow us to often do real expected practical work instead, we do more of science demonstrations.*

T3: *In most times when teaching, I do observe that most students have no passion for the subject for it is difficult to see their eagerness for the subject except for some specific things expected at this level told by their former science teachers and others.*

S*: I used to like Integrated Science as I have got high expectation concerning it but my friends negatively influenced me towards science due to the fact that we don't have resources for practical investigations and since then my feelings for science has been bad.*

T4*: Most students think that Integrated Science as a natural science should not trouble their minds in any of its attempt in offering explanation to natural events. This however is not how science work but it involves thought provoking.*

S*; We have learned Integrated Science throughout primary and junior high schools and it has been always been the same. More effort should rather go to subjects we have not learned before this time.*

This means that although students expect great enjoyment from learning Integrated Science, they however could not process the enjoyment by learning it due to their thinking of science as difficult and abstract subject. This is because enjoyment is the act of receiving pleasure from learning science. Student's level of science enjoyability affect students' academic performance. Students also do not see enough real practicality of science as expected of them in the learning of the Integrated Science due to

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insufficient teaching and learning resources. Practicability refers the quality of science learned being usable to student life such as soap making. Appropriate science practical activities bring out scientific concepts better and ultimately improve students' academic performance. Students expect more practical work that relate to technology in the society which was limited more of science demonstrations. Most students lost attachment with science when they do not meet their expectations in science. Again, most students considered Integrated Science so easy and do not want to engage any much effort in learning it. Students feel Integrated Science as requiring very little effort in learning led to reduced commitment to neglect which negatively affect their academic performance.

When the findings obtained in relation to the students' expectation is examined, it is seen that the study correlates with studies such as Ogunkola, and Samuel (2011) which stated that students find Integrated Science difficult, boring and uninteresting due to their thinking of science as abstract subject. Quansah, Sakyi-Hagan, and Essiam (2019) stated that when students are involved in the appropriate science activities with the materials, they understand the needed scientific concepts better and ultimately improve their academic performance. The lack of self-attachment leads to low commitment to hard work on the part of students, and it is the highest rated factor that affect the success of the students (Sibanda, Iwu & Benedict, 2015). Sarabi, and Abdul-Gafoor (2018) state that the learnt beliefs that Integrated Science require less effort make students study other subjects more to its neglect.

Hence, the declination of students' expected enjoyment in science due to misconceptions, the insufficient practicality as observed, the loose attachment to the subject by students and the high level of easiness perceived on the part of students in

the subject were perceived to negatively affect their academic performance in Integrated Science.

4.4.3.3 Students learning habits

Learning habits refer to actions such as reading, taking notes, holding study groups where the students perform regularly and habitually in order to accomplish the task of learning. Study or learning habits play a vital role in reflecting the standard of education and students' academic performance. Good learning habits enable students to be most productive and efficient in their academic success.

A variety of aspects were investigated in relation to the students' learning habits. The findings indicated time management, study schedule, specific goals, and personal notes taking in the subject were the perceived factors affecting academic performance in Integrated Science.

With regard to student expectation variables, most students and most teachers perceived that the students do not regularly revise the Integrated Science before classes in the schools (60.3% & 88.8% respectively, Table 10); students do not have any study schedule for Integrated Science in the schools (63.4% & 88.8%, respectively, Table 10); students do not take personal notes from lessons for revision (65.4% & 72.3% respectively, Table 10) and students do not search for supplementary reading material and notes on Integrated Science in the schools (73.1% & 83.3% respectively, Table 10). With regard to this issue, this is how students and teachers responded in the interview;

T1: *What I realised happening is that, most students are suffering with low self-discipline and do occupy themselves with several distractions. We advise them every day and we have seen some have changed and are doing better in the science now.*

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S*: I don't get time for Integrated Science due to loads of engagement every day. This has been my problem with Integrated Science performance because, it's broad and gives me headache as it demands thorough and constant learning.*

T2*: Most of my students do not have any plan that guides their study and so you see them busy but for nothing. The situation here is worrisome in fact for the subject.*

S*: We don't have or follow any guide for our studies. We study constantly what subject the teacher punishes us for low performance when assessed. I study Integrated Science for exams.*

T3*: My students in some cases have to be forced to come for Integrated Science lessons. Their show of no interest in the subject sometimes makes me bore as a teacher but we are still forcing.*

S*: We don't get any motivation for Integrated Science studies. It is like we have learned the same things in our junior high schools.*

T4*: Most students don't take notes for whatever they learn either during class interaction or personal studies. Consequently, they have nothing to revise before class. When asked what was taught the day before, as if they were never taught. This is not helping in the study of the subject at all.*

S*: We actually do not write personal notes from the teachers and other sources because we think we have textbooks and pamphlets that we cannot even learn. During exams, most of us were asking ourselves where specifically to revise and it did not help us good at all.*

This means that students poor time management behaviour may lead them to stress and incomplete assigned academic tasks. Time management is very important in academic environment. Most students also do not have any study schedule for Integrated Science. Study schedule is a plan structure consisting of subjects and balanced activities, time

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and duration for which learning tasks, events, or actions are intended to take place. Most students do not have any plan guide for studies and some important subjects such as Integrated Science may only be revised once a semester. Students again do not set or have specific goals for the subject and are not motivated to study as well as show no discipline. Specific goals are those specific intentions of desired results of an activity one wants to accomplish by being committed and direct all efforts to it within a specific time frame. These goals have clear and well-defined objectives without which academic performance will be negatively affected. Furthermore, most students do not take personal notes from lessons or other sources for revision and which negatively affect their academic performance. This sign also means lack of attention, listening or reading and focus since the practice of note taking is a critical way to enhance learning. Note taking is the practice of concisely writing or recording essence of information from different sources for future use and reference.

When the findings obtained in relation to the students' learning habit is examined, it is seen that the study correlates with studies by Greetika, and Vyas (2017); Crow, and Crow (2002) which state that time management behaviour is very important for good academic performance in schools. Crow, and Crow (2002) also state that effective study habits include a plan, definite timetable and well-organised brief note taking for academic success. Greetika, and Vyas (2017) state that specific goals strengthen healthy study habits among students as the regular practice of one or more study skills result in achieving good academic performance. Crow, and Crow (2002) emphasised that one of the most important components of study habit central to findings includes: reading or listening, concentration, comprehension, selection of main ideas, and note taking, and these skills are directly proportional to students' academic performance in any course of study.

Hence, poor time management on the part of students, the lack of study schedule for studies, lack of specific goals on the part of students for the subject, and lack of personally note taking on the part of most students in the subject were perceived to negatively affect their academic performance in Integrated Science.

4.5 Chapter summary

This chapter presented the data, and the analysis of responses from the teacher's and the student's questionnaires as well as the interviews with the teachers and the students were presented. Only those factors that were regarded as having a negative impact were discussed in detail. Furthermore, both teachers and students attached the performance in Integrated Science to student's immediate environment; the teachers' quality and some student-related variables such as interest in the subject, expectations and learning habits. One could come to the conclusion that the immediate environment, teacher quality as well as student factors all were perceived to affect student's academic performance in Integrated Science in the Jomoro Municipality.
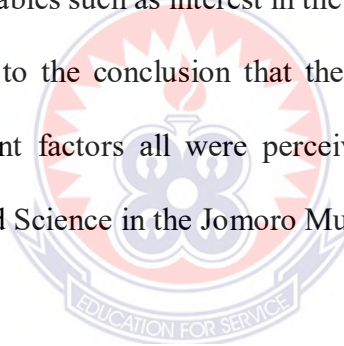
CHAPTER FIVE

SUMMARY OF THE FINDINGS, CONCLUSIONS, RECOMMENDATIONS

AND SUGGESTIONGS FOR FURTHER RESEARCH

5.0 Overview

This chapter presents the summary of the findings of the study, conclusion and recommendations drawn from the study findings. It also includes suggestion for further research on the topic in other rural areas Ghana.

5.1 Summary of the Findings

This study explored the perceived factors affecting academic performance of students in Integrated Science in the Jomoro Municipality. Below is the summary of the main findings that emerged from the study:

1. Environmental factors that were perceived to affect academic performance in Integrated Science in the Jomoro Municipality Senior High Schools were;

    a. Poor parenting style

    b. Poor socioeconomic backgrounds of students

    c. Low parental education status

    d. Inadequate classrooms for effective teaching and learning

    e. Insufficient teaching and learning resources

    f. Poor dining meals for students

    g. peer-group interest

    h. Peer overdependence

    i. Peer students' reaction to ethnicity

2. Teacher-related factors that were perceived to affect academic performance in Integrated Science in the Jomoro Municipality Senior High Schools.;

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    j.   Insufficient number of professionally trained Integrated Science teachers

    k.   Lack of integrated knowledge of the subject

    l.   Low self-confidence in teaching difficult topics

    m. Use of inappropriate pedagogical skills in teaching

    n.   Use of inappropriate instructional methods in teaching

    o.   Inadequate use of instructional materials in teaching

    p.   Non-use of activity-based learning in Integrated Science

    q.   Lateness for lessons

    r.   Teachers being insensitive to students during lessons.

    s.   Laziness on the part of some teachers

3.   Student-related factors that were perceived to affect academic performance in Integrated Science in the Jomoro Municipality Senior High Schools.;

    t.   Lack of interest by students toward the subject.

    u.   Lack of study schedule for the subject.

    v.   Poor learning habits.

    w. Lack of study guide.

    x.   Lack of specific goals.

    y.   Misconceived expectation.

5.2 Conclusions

The study examined the perceived factors that affect students' academic performance in Integrated Science in the Jomoro Municipality. On the basis of the findings, the perceived factors related to environment, teachers, and students were found to be contributing negatively to students' academic performance in the Jomoro Municipality. These factors include poor parenting style, poor socioeconomic background, low parent

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education status, insufficient classrooms, poor meals, insufficient teaching and learning resources, peer negative influence, peer overdependence, distractions and abuse, insufficient professionally trained Integrated Science teachers, inadequate use of TLMs, insensitivity of teacher to students during lessons, teacher absenteeism and lateness, lazy attitude, lack of interest toward subject by students, poor learning habits, lack of study schedule and misconceived expectations. This study therefore concluded that these factors attributed to teachers, students, parents and the school environments were perceived as primarily responsible for negatively affecting students' academic performance in Integrated Science in Jomoro Municipality. It must be emphasised that these factors generally do not operate in isolation. Teacher absenteeism and lateness, for example, would result in incompletion of the syllabus and would also affect pupil's motivation, enthusiasm, zeal and commitment to learn. Improving the academic performance of students in Integrated Science in Jomoro Municipality schools should not involve paying attention to individual issues discussed. It should involve a total package.

5.3 Recommendations

Based on the findings and the conclusions drawn the following recommendations are made:

1. There is the need for Parent Association (PA) of the schools to collaborate with other stakeholders to educate the parents on the role they should play toward successful education of their wards in the schools. This would help them undertake their role properly in supporting their wards in the schools for better academic performance.

2. Government and other organisations should as a matter of urgency come to the aid of the Senior High Schools in the Jomoro Municipality in terms of the

provision of facilities as well as learning resources to facilitate effective teaching and learning in the schools. This would help to motivate both teachers and students to undertake the teaching and learning of the subject more seriously.

3. Guidance and counselling unit in the schools could intensify their meetings with students in order to properly equip them with healthy friendship relations, and reduce some of the misconceptions among students in the schools. This will ensure healthy relations and better perception of this very important core science.

4. Managements of the schools could arrange for in-service training for teachers specialised in different subjects and who are teaching Integrated Science with intense supervision.

5. Integrated Science teachers in the schools could be taking through some techniques and skills needed to improvise locally to facilitate better understanding and interest among students.

5.4 Suggestion for further Research

A replication of this study should be done in other Municipalities in different regions.

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APPENDIX A:

TRANSMITTAL LETTER

UNIVERSITY OF EDUCATION, WINNEBA

FACULTY OF SCIENCE EDUCATION

University of Education, Winneba
P.O. Box 25,
Winneba, South Campus.
20th October, 2022.

Dear Respondent,

Hi, it's a pleasure meeting you. I am a postgraduate student pursuing a Master of Philosopher in Science Education. As part of the requirements for this degree, I am carrying out a research entitled ***"PERCEIVED FACTORS AFFECTING ACADEMIC PERFORMANCE OF STUDENTS IN INTEGRATED SCIENCE: A STUDY IN THE JOMORO MUNICIPALITY"***. You have been sampled and selected as a respondent for this study. You are therefore humbly requested to participate in the exercise as a respondent by completing the attached questionnaire. Kindly complete all the indicated questions as truthfully as possible, correctly and honestly as per the instructions provided and return them to me. I do request for your cooperation and support.

Also, please note that the information gathered from this research will be purely for academic purpose and any information provided for the study will be treated with the utmost confidentiality and anonymity.

Yours Faithfully,

MR MOHAMMED IDDRISU

APPENDIX B:

QUESTIONNAIRE FOR STUDENTS

Dear Student,

This questionnaire is intended to collect information on the "factors affecting senior high school students' academic performance in Integrated Science in the Jomoro Municipality". The questionnaire is designed purely for academic purposes and as such, any information provided will be treated with the utmost confidentiality and anonymity. You do not need to write your name, and no individuals will be identified or traced from this. The identity of the respondent will remain confidential and non-traceability. To the best of your knowledge and ability, please provide your candid responses to the questions in this questionnaire as they relate your personally assessment.

INSTRUCTION: Do not write your name and that of your school on the questionnaire. Please, indicate response nearest to your opinion by ticking (√) in the most appropriate box to each question provided.

Biographic Data

Are you a boy or girl? (Please tick only one) Boy [   ], Girl [   ].

SECTION A: ENVIRONMENTAL-RELATED FACTORS

	Strongly Disagree **SD**	Disagree **D**	Neutral **N**	Agree **A**	Strongly Agree **SA**
Statements	1	2	3	4	5
Home					
1). My home environment is a conducive learning home environment.					
2). My parent/s involve and support.me to learn.					
3). Domestic workload at home negatively affects my studies.					
4). Unregulated use of electronic media devices at home.					
School					
5). The school provides students with good meals.					
6). Adequate classrooms' space for learning.					
7). Inadequate reading and learning materials					
8). Inadequate teaching and learning materials					
Community					
9). Peer group influence negatively affects their conduct and behaviour					
10). Peer group influence positively affects their class attendance and work.					
11). Peer group influence affects my learning negatively.					
12). Peer group interactions influence positively good academic behaviour.					

SECTION B: TEACHER BACKGROUND AND QUALITY

	Strongly Disagree **SD**	Disagree **D**	Neutral **N**	Agree **A**	Strongly Agree **SA**
Statements	1	2	3	4	5
QUALIFICATION					
13). Teacher's qualification affects students.					
14). Low confidence in teaching negatively affects students.					
15). Aspects teaching of Integrated Science help students.					
16). Holistic subject matter positively affects learning.					
Methodology					
17). Varies teaching styles and approaches in class to suit all.					
18). Engages students in the teaching and learning process.					
19). Uses different teaching and learning materials during lessons.					
20). Taking and guiding students through practical investigations.					
Teacher's Attitudes					
21). Regular for all science lessons.					
22). Sensitive and easily approachable.					
23). Frequently absent for lessons without making it up.					
24). Does not promptly give feedback to students on academic progress.					

SECTION C: STUDENT-RLATED FACTORS

Statements	Strongly Disagree **SD**	Disagree **D**	Neutral **N**	Agree **A**	Strongly Agree **SA**
	1	2	3	4	5
Interest					
25). Attends almost all Integrated Science lessons. .					
26). Actively involve in all activities of learning science in the school.					
27). Do all exercises and assignment promptly.					
28). Devote no time for studying Integrated Science.					
Expectation					
29). Expect enjoyable science lessons for life					
30). Expect to do science practical investigations on some topics.					
31). Expect the school to provide all learning resources accessible to students.					
32). Expect to pass Integrated Science with ease.					
Learning habits					
33). Regularly revise the subject before class					
34). Have no schedule for Integrated Science.					
35). Take personal notes from lessons for revision.					
36). Search for supplementary reading materials and notes on science.					

Please, kindly check that no answer has been inadvertently missed out.

And kindly return of the completed questionnaire as soon as you finish ticking all
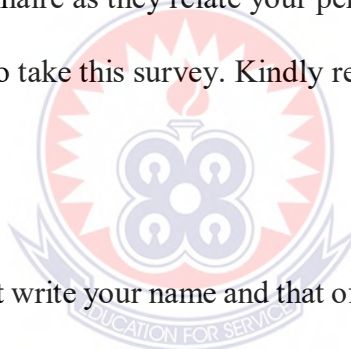
responses.

Thank you for taking your time to response to my survey questionnaire and for

your participation and cooperation.

APPENDIX C:

QUESTIONNAIRE FOR TEACHERS

Dear Sir/Madam,

This questionnaire is intended to collect information on the "factors affecting senior high school students' academic performance in Integrated Science in the Jomoro Municipality". The questionnaire is designed purely for academic purposes and as such, any information provided will be treated with the utmost confidentiality and anonymity. You do not need to write your name, and no individuals will be identified or traced from this. The identity of the respondent will remain confidential and non-traceability. To the best of your knowledge and ability, please provide your candid responses to the questions in this questionnaire as they relate your personally assessment.

Thank you for agreeing to take this survey. Kindly read through each of the items carefully.

INSTRUCTION: Do not write your name and that of your school on the questionnaire. Please, indicate response nearest to your opinion by ticking (√) in the most appropriate box to each question provided.

Biographic Background

Gender: (please, tick one only) Male [   ] Female [   ]

SECTION A: ENVIRONMENTAL-RELATED FACTORS

Statements	Strongly Disagree **SD**	Disagree **D**	Neutral **N**	Agree **A**	Strongly Agree **SA**
	1	2	3	4	5
Home					
1). My home environment is a conducive learning home environment.					
2). My parent/s involve and support.me to learn.					
3). Domestic workload at home negatively affects my studies.					
4). Unregulated use of electronic media devices at home.					
School					
5). The school provides students with good meals.					
6). Adequate classrooms' space for learning.					
7). Inadequate reading and learning materials					
8). Inadequate teaching and learning materials					
Community					
9). Peer group influence negatively affects their conduct and behaviour					
10). Peer group influence positively affects their class attendance and work.					
11). Peer group influence affects my learning negatively.					
12). Peer group interactions influence positively good academic behaviour.					

SECTION B: TEACHER BACKGROUND AND QUALITY

Statements	Strongly Disagree SD	Disagree D	Neutral N	Agree A	Strongly Agree SA
	1	2	3	4	5
QUALIFICATION					
13). Teacher's qualification affects students.					
14). Low confidence in teaching negatively affects students.					
15). Aspects teaching of Integrated Science help students.					
16). Holistic subject matter positively affects learning.					
Methodology					
17). Varies teaching styles and approaches in class to suit all.					
18). Engages students in the teaching and learning process.					
19). Uses different teaching and learning materials during lessons.					
20). Taking and guiding students through practical investigations.					
Teacher's Attitudes					
21). Regular for all science lessons.					
22). Sensitive and easily approachable.					
23). Frequently absent for lessons without making it up.					
24). Does not promptly give feedback to students on academic progress.					

SECTION C: STUDENT-RLATED FACTORS

Statements	Strongly Disagree **SD**	Disagree **D**	Neutral **N**	Agree **A**	Strongly Agree **SA**
	1	2	3	4	5
Interest					
25). Attends almost all Integrated Science lessons. .					
26). Actively involve in all activities of learning science in the school.					
27). Do all exercises and assignment promptly.					
28). Devote no time for studying Integrated Science.					
Expectation					
29). Expect enjoyable science lessons for life					
30). Expect to do science practical investigations on some topics.					
31). Expect the school to provide all learning resources accessible to students.					
32). Expect to pass Integrated Science with ease.					
Learning habits					
33). Regularly revise the subject before class					
34). Have no schedule for Integrated Science.					
35). Take personal notes from lessons for revision.					
36). Search for supplementary reading materials and notes on science.					

Please, kindly check that no answer has been inadvertently missed out.

And kindly return of the completed questionnaire as soon as you finish ticking all responses.

Thank you for taking your time to response to my survey questionnaire and for your participation and cooperation.

APPENDIX D:

TEACHERS' INTERVIEW GUIDE

UNIVERSITY OF EDUCATION, WINNEBA
FACULTY OF SCIENCE EDUCATION
DEPARTMENT OF INTEGRATED SCIENCE EDUCATION

1. How would you describe the immediate environmental components of learners?

   - Home

   - School

   - Community

   How did these environmental components affect the academic performance of students in Integrated Science in senior high schools in the Jomoro Municipality?

2. How would you describe the Integrated Science teachers background and qualities below in your school?

   - Qualification

   - Methodology

   - Attitudes

   How did the teacher background and quality above affect the academic performance of the students in Integrated Science in senior high schools in the Jomoro Municipality?

3. How would you describe the students' characteristics below in your school?

   - Interest

   - Expectation

   - Learning habits

   How do the students' interest, expectation and learning habits affect the academic performance of the students in Integrated Science in senior high schools in the Jomoro Municipality?

4. What other factors would you identify as contributing to academic performance of learners in Integrated Science? Explain why?

APPENDIX E:

STUDENTS' INTERVIEW GUIDE

Students' interview Schedule

1. Is your academic performance in Integrated Science good? what do you identify as a contributory factor towards your performance in Integrated Science?

2. How would you describe your family state? What are the factors that come with living in such a family that affect your learning?

3. How would you describe the state of your school? What are the factors that come with the school that affect your learning?

4. How would you describe your relationship with your classmates? Does it have an impact on your learning?

5. How would you describe your Integrated Science teacher in terms of qualification? Does his/her kind affect your learning?

6. In your opinion, describe how your teacher teaches Integrated Science?

7. How do you see your Integrated Science teacher's attitude? How does that affect your academic performance?

8. Do you enjoy the teaching and learning of Integrated Science? Explain how that affect your academic performance.

9. Do you set grade targets for yourselves? If no, why? If yes, how do you work towards its achievement?

10. How do you study Integrated Science as a student? Does your study habit affect your academic performance?

11. How do you attend and participate in your Integrated Science lessons? Does your anticipation affect your academic performance in Integrated Science?

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12. What other factors would you identify as contributing to your academic performance in Integrated Science? Explain why?