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THE EFFECT OF FLIPPED CLASSROOM ON STUDENTS' ACADEMIC

ACHIEVEMENTS IN TEXTILE WEAVING: THE CASE OF PRESBYTERIAN

SENIOR HIGH SCHOOL, BOMPATA

BY

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THE EFFECT OF FLIPPED CLASSROOM ON STUDENTS' ACADEMIC ACHIEVEMENTS IN TEXTILE WEAVING: THE CASE OF PRESBYTERIAN SENIOR HIGH SCHOOL, BOMPATA

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DECLARATION

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma at Kwame Nkrumah University of Science and Technology, Kumasi or any other educational institution, except where due acknowledgement is made in the thesis.

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DEDICATION

This work is graciously dedicated to my dearest mum, Madam Mary Boatemaa Agyekum, my

sister Patricia Akuamoah-Boateng and my daughter Bejoy Boatemaa Boateng.

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ABSTRACT

Technological advancement and innovations in technology continue to shape and influence various aspects of human endeavour and various sectors of the economy ranging from education, commerce, culture and entertainment. Student's ability to develop an interest in a course and consider pursuing a career in that particular field is determined on the effectiveness of teaching and learning methods adopted. To ensure active participation and to inflame the passion of students in the study of weaving amid the challenges of equipment, and materials, there is the need to employ alternative teaching strategies that drive passion and provide the needed engagement such as flipped learning.

The purpose of this study has been to identify the existing instructional strategies used in teaching textile weaving, introduce the flipped learning model as a pedagogical strategy for teaching weaving in textiles in and to examine the effectiveness of the flipped classroom model in the teaching and learning of textiles weaving on students' academic performance in Presbyterian Senior High School. The research method employed was the mixed- method which involves the use of both qualitative and quantitative method. The data was gathered from a sample size of 44 respondents comprising First Year Visual Arts students at Presbyterian Senior High School, Ghana through purposive sampling technique and analyzed using the Statistical Package for Social Sciences (SPSS) Version 21. Flipped classroom teaching and learning methods have been found to make teaching and learning easier and fun for students due to its student-centeredness and the use of modern technology which most students have found very adaptable. Further findings have shown a remarkable improvement in students' academic performance through the introduction of the flipped classroom as instructional method compared with the traditional method of teaching and learning as indicated by pre-test and post-test results of 22.7% and 93.2% pass respectively. However, adequate computers and constant supply of electricity are required in order to undertake flipped classroom teaching and learning. It has been recommended that the ICT lab be furnished with adequate computers and lab assistants be available in order to ensure effective use of flipped classroom as an instructional method.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Clothing (textiles) provides the necessary protection of the human body from the weather according to (Convissor, 2014). These needs are the physical requirements for human survival and if they are not met, the human body cannot function properly and will ultimately fail. According to the Maslow Hierarchy Needs, these needs are thought to be the most important and should be met first. The need for clothing has brought about the production of textiles to solve one of the basic needs of man.

Textile literally means 'that which has been woven'. It is derived from the Latin word 'texere', which means 'to weave'. The production of textiles is a craft whose speed and scale of production has been altered almost beyond recognition by industrialization and the introduction of modern manufacturing techniques according to (Farlex, 2012). These techniques of textile production include knitting, crocheting, braiding, macramé, weaving, knotting, lacing, and plaiting.

Weaving according to Sackey (2002) is acknowledged as one of the oldest surviving crafts in the world and is one of the primary methods of textile production. Weaving is a textile production method which involves interlacing a set of longer threads (called the warp) with a set of crossing threads called the weft (Adu- Akwaboa, 1994). This is done on a frame or machine kown as a loom, of which there is an number of types. Weaving is still being done manually (the use of manpower looms), but the vast majority of weaving is mechanized (the use of power looms). Weaving is a topic in the Ghana education syllabus which is studied under textiles.

According to Asihene (2009), the Visual Arts curriculum at Senior High School comprises definite and unique academic work in 8 subjects that are elective. They include, Basketry, Sculpture, Ceramics, Leatherworks, General Knowledge, Graphic Design, Textiles and Jewellery. Textile art comprise both theoretical and practical components and these are outlined in the syllabus to broaden students' scope of vocabulary and also develop students' ability to think, feel as well as act creativity with visual materials in the environment, Curriculum Research and Development Divisions (CRDD, (2010). These help to advance the complete development of each student by improving and increasing their intellectual, emotional, personal, social, psychomotor and vocational skills.

Teaching and learning of weaving under textiles use several methods including discussion method, lecture method, demonstration as well as excursion methods. Modern methods of teaching where technology is incorporated have yet not been utilized in the teaching and learning of weaving. An important function is played by technology daily. Digital technology is dependent on periodically by both young and old as they interact with it the technology. Currently, activities such as reviewing medical claims over the internet, carrying out a registration for courses in college as well as looking out for text messages can be carried out on smartphones just by touching the screen. It is no doubt that technology has moulded the manner in which communication is done in the world. Senior high school students in this era have not lived in a time without technology (Lamanauskas, 2011). In view of this, SHS students are very familiar with current trends in their educational studies. Such may be adopted as stepping stones to increasing their performance academically while critically thinking. The passion of students is dependent on technology with digital media having great impacts on their education (Louw et al., 2008). Newer teaching methods may

incorporate these technologies such as television, radio, internet, multimedia, and other modern devices. More times, students avert the archaic methods of doing homeworks and class works. This is identified as flipped learning.

Flipped learning is considered as instructional technique. It is a kind of learning that is blended to reverse adopting traditional methods of learning through instructional content delivery. Activities comprising of the ones with consideration for traditionally doing homework. Online discussions and online lectures are watched by students in a class with flipped learning. In the same way, research works are conducted in their various homes with instructions and help from a tutor or mentor (Louw et al., 2008).

Due to this, flipped learning can also be used as a teaching method in teaching weaving in textiles to enhance better understanding of concept by students at the SHS level in the country.

1.2 Statement of the Problem

The academic progression of students is critically dependent on the methods of teaching. This is because pathways to facilitate learning can be created with positive impacts being impacted on achievements of individuals academically (Caballero, 2010). Academic achievement of students often depend on teaching methods adopted by teachers as they have tremendous impacts on the ways students regard some subjects. It also affects the way students regard education on the entirety. Instructors or tutors constitue representative bodies of the subjects they teach (Saunders et al., 2014). Teachers are regarded as faces of teaching and learning as they are responsible for presenting materials that may trigger curiosity in their students or make students not encouraged to pursue the topics taught in class.

This can however negatively affect the student's ability to look for other options in relation to further career. Weaving as a topic is treated under textiles and being a practical- based topic, it has to be taught in the first year in SHS according to the Ghana Education Services (GES) teaching syllabus (2010). Due to its practical nature, the strategy often employed is a demonstration which involves the use of the loom. However, the unavailability of the loom and other weaving accessories in the schools have resulted in the use of lecture and abstract methods for teaching weaving. Sadly, these methods rather make students passive learners due to the lack of a mechanism to ensure that students are intellectually engaged with materials. Eventually, student's interest and desire for weaving dwindle leading to the development of a phobia.

To ensure active participation and to inflame the passion of students in the study of weaving amid the challenges of equipment, and materials, there is the need to employ alternative teaching strategies that drive passion and provide the needed engagement such as flipped learning. In flipped learning, there is an introduction of the student body to concepts that are pre-recorded over the internet along with video and recordings that are audio visual (Saunders, 2014). Students are mostly expected to attend class during subsequent class meetings. During such meetings, they are expected to discuss the material they learnt with their colleagues in class as well as their teachers. The study, therefore, seeks to employ flipped learning as an alternative strategy for effective teaching of weaving in Presbyterian Senior High School, Bompata.

1.3 Objectives of the Study

The study sought to:

1. Identify and analyze the existing instructional strategies used in teaching weaving in the Presbyterian Senior High School.

2. Introduce the flipped learning model as a pedagogical strategy for teaching weaving in textiles in Presbyterian Senior High School.

3. Test the effectiveness of the flipped classroom implementation in teaching weaving on students' academic performance in Presbyterian Senior High School.

1.4 Research Questions

1. How effective is the existing the teaching method on students' academic performance in textile?

2. What are the pedagogical considerations for using the flipped learning technique in teaching textile weaving in Presbyterian Senior High School?

3. What is the extent to which implementation of flipped learning is effective in teaching weaving on academic performance of students in Presbyterian SHS?

1.5 Hypothesis

H_o: Students who are taught weaving with the flipped learning strategy will have no interest in weaving as a topic in Textiles.

1.6 Delimitation

The study is limited to Visual Art students in the Presbyterian SHS in Bompata that is situated in Ashanti Region, specifically, Asante Akim South.

1.7 Importance of the Study

The research will firstly benefit Textiles teachers, Ministry of Education and Curriculum Research and Development planners since they will identify and

understand the existing instructional strategies for imparting knowledge on Textile education in SHS and their effects on students' academic performance in the classroom.

Secondly, the research will be of importance to students and instructors in Textile Departments in all SHS since it will reveal appropriate pedagogical strategy such as flipped learning that can be used to facilitate the teaching of the subject to improve students' understanding. Finally, the findings of the research would provide assistance to Ghana's Ministry of Education when the matter of reviewing the curriculum of textile learning in SHS arises.

1.8 Definition of Terms

The operational definitions of the technical terms used in this thesis are as follows:

Flipped learning/classroom: Are an instructional strategy and a type of blended learning that reverses the traditional learning environment by delivering instructional content, often online, outside of the classroom.

Syllabus: This is an academic document that communicates course information and defines

expectations and responsibilities.

Teaching: Something that is taught, the ideas and beliefs that are taught by a person.

Weaving: This is a method of textile production in which two distinct sets of yarns or threads are interlaced at right angles to form a fabric.

Textiles: Is a process of making a fabric

Strategy: Is a plan of action designed to achieve a long- term or overall aim.

Pedagogical: The study of the methods and activities of teaching.

Implementation: The process of putting a decision or plan into effect.

6

Effectiveness: The degree to which something is successful in producing the desired result.

Instructional: Giving detailed information about how something should be done.

Learning: The acquisition of knowledge or skills through study, experience, or being taught.

1.9 Acronyms and Abbreviations

- ✦ **CRDD:** Curriculum Research and Development Divisions

- ✦ **SHS:** Senior High Schools

- ✦ **TLMs:** Teaching and Learning Materials

- ✦ **GES:** Ghana Education Service

- ✦ **ICT:** Information and Communication Technology

- ✦ **Fig:** Figure

1.10 Organization of the Thesis

The first chapter of the current study provided an introduction to the study which comprised of the study background, problem statement, objectives and research questions, limitation and delimitation, significance of the study, definition of terms and abbreviations as well as organization of the thesis. The second chapter covered theoretical and empirical discussions on weaving in Textiles education under the Visual Arts education and the use of flipped learning as an alternative teaching strategy for weaving. The third chapter outlines methods employed in the study to facilitate data collection. Design of the research, research methods, total number of people included in the study as well as research instruments for gathering data for analysis. Chapter four deliberates on the analysis and interpretation of all data collected from the field. A summarized form of the study findings, conclusion and recommendation were outlined in the final chapter of the study.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.0 Overview

This section discusses the theories and views of authors on the topic which is relevant to the thesis. The review focuses on the following sub-topics: Development in Education of teaching and learning models, Theoretical framework, Social Learning, Connection of Theories to learning, teaching and learning of Textiles, Learning styles, SAMR model, Technology Acceptance Model (TAM), and Flipped Classroom.

2.1 Development in Education of Teaching and Learning Models

There have been various attempt to improve the effectiveness of teaching and learning models in SHS in the country. These efforts have led to the search for alternative methods of teaching and learning in school and the recognition of the need to revise the academic curriculum.

Advancement in technology has brought higher dimension and influence on the teaching and learning models adopted by educational systems. To enhance the academic performance of discovery learning, facilitation, technology and collaboration among students are being infused into curricula (Archambault et al.,2010). According to Kulkarni (2012), teacher facilitation, infusion of technology and student collaboration all improve the academic performance of students.

An number of researches has argued for total overhaul of the educational system in the country (Rycik, 2012), while others have suggested that alternative teaching and learning models for improving academic performance of students be sought (Anderson, 2007). Mixed curricula including multimedia assisted instruction, artificial

intelligence software, and inverted curriculum are being adopted by educators (Ritter et al. 2007).

It has been acknowledged that mixed curricula implementation can set the pace which provides solutions to enhance academic performance while attempting to implement other ways of alleviating the challenges associated with educationin textiles. Ovemyer (2012) stated that, educational technology, teacher pedagogy and differentiated instruction play a significant role in implementing a flipped classroom (Overmyer, 2012).

According to Caballero (2010), the academic attainment of students is extremely significant with teachers' pattern of pedagogy as they affect ways students consider some subjects and even how they consider their education on the entirety. He further stated that, tutors represent the subjects they teach. Caballero (2010) asserted that, pedagogy is very essential to the educational progress of teachers due to the fact that, patterns of learning can be created which may affect academic attainment of students while impacting the thinking ability of visual art students.

In daily lives of visual art students, technology is expected to play a critical function. People who are old and young rely on digital technologies regularly while interacting with them. Activities such as review of medical claims over the internet, social media update, registration of courses to be done in a term, as well as regular checking of text messages can be executed on a smart phone (Lamanauskas, 2011). Technology has without doubt shaped communication in the world. Lamanauskas (2011) clarified that, secondary school students in this era were exposed to digital technology from birth. He confirmed the statement of Louw et al. (2008) that, children of today are familiar with

IT as they may be used as basics to increasing thinking ability and academic attainment of visual art students.

Ensuring that students attain all that they require is critical to reaching to students in an academic manner. According to Adam and Pierce (2012), techniques in customizing teaching include variational instructions that allow educationists to differ in their instructions while honing on weakness and strengths of students. Additional practices may be received by students immediately their weaknesses and strengths are laid to bare towards remedying misconceptions in relation to concepts and also fill the spaces in education. Subban (2006) asserted that, much focus may be rendered by students making them advance their ability to think critically while ultimately influencing their performance.

Although advantages associated with digital technology and its implementation of varying models of instruction lead to provision of student educational benefits, development of teachers are promoted while inherently impacting them. Teachers are made to use IT as they are entreated to be updated at all times. To add, such teachers end up being reflexsive practitioners, thus, promoting accountability while attempting to include instructional models that vary (Anderson, 2007). In its entirety, efforts of teachers' instruction and their model variation associated with flipped learning are expected to provide advantages to visual art students and their teachers. Brown-Martin (2012) asserted that, the constituents provide encouragement to academic performance of students while improving students' ability to think critically.

2.2 Theoretical Framework

Bandura and Vygotsky's theories were used in explaining the relationship between flipped classroom, textile learning and student performance. Sedig (2008) asserted that,

learning via interactions on social media or even with teachers or even in a group, students any retain the knowledge that they discovered by themselves along with information gotten from assistants to their teachers.

2.2.1 Social Constructivism Theory of Vygotsky

It was suggested by Vygotsky that; knowledge is gotten via interactions over the internet as well as via cultures to obtain meaningful educational experience. With implementation of Vygotsky's theory in a maths class, mathematical information was retained by students over a long term as they got the concept without taking its difficult aspect into consideration. This resulted in maximization of student academic attainment. This was posited by Jones et al. (2010). Social interaction or exchange playing a key function to deepen cognitive of individuals is an essential part of the constructivism theory. According to Vygotsky (1978), there is twice appearance of functions related to cultural development of children. The interest and attitude of students in relation to maths be considered for effective learning of maths to occur. Alvarez (2007) was of the view that, design of instructions should be done such that there is effective interaction in class. Such concepts are however proof in classrooms that apply flipped learning as they work better in the identified framework.

In lessons to help students to retain and obtain relevant information, it was suggested by the theory that, effective scaffolding should be included. According to Lave (1998), classes that employ flipped learning ensure the provision of optional methods of scaffolding while supporting skills of solving problems and reasoning of students. Suh (2010) posited that, scaffolding attains support at levels of meta-cognition against scaffolding traditionally which is available in customary settings. Teachers make the right techniques available to ensuring knowledge precision for development of content.

Lewis et al. (2011) was of the view that, development content of students are supported by inverted class teachers through provision of activities that are suitable at the right stage of complexity and difficulty. With proper amounts of help, teachers provide students with the constructions relevant to their academic works via proximal development of zones.

2.2.2 Social Learning Theory of Bandura

Another theory for inverting classroom and explaining the way learning takes place as well as its retainability was provided by Bandura in 1977. According to Bandura (1977), the behavior of a student, his situation and the individual himself influence their next action. In lieu to this theory, learning takes place in a social manner with students learning from their ways of dealing with adults and their peers. It was stated by Abbott (2007) that, factors of cognition and the environment interacting with each other affect behavior and learning of humans as far as social learning theories are concerned. They lay more emphasis on education which takes place in social contexts while considering that, individuals learn from their mistakes and from their peers. In SLT, individuals seek knowledge on evolving behaviour and information through carrying out observation of other people. It was believed by Bandura that, the behaviour of a learner resulted from viewing other people.

In observational education, there is description of a wide array of students. According to Abbott (2007), for effective learning that is observational, four steps must be shown by students namely, sufficient reproduction, retention, motivation and attention. Other states automatically follow once conditions are met. Abbott (2007) further stated that, the tone of the outcome is attention which is mostly used to determine the extent of effectiveness of while extending much focus on the things that need to be modelled. Other conditions would be met as logn as attention is received. SLT is put on display

in classes that adopt the flipped learning. Inverted classes may start addressing and alleviating certain issues even though solutions may not be provided to every challenge. During instructions while applying flipped learning technique, engagement of students as well as their collaborations ma all be addressed (Bernett, 2012).

2.3 Theory of Social Learning

Concepts and skills that are learned by secondary school children in their early academic lives are reorganised in a cognitive manner through controlling the symbols mentally. Children who are older learn very difficult skills rapidly with oral instructions just through an observation of the model (Miller, 2011). Collaboration among peers and more representation are supported by SLT. Multiple representation is delivered via technology in classes that apply flipped learning. They can also be found in optional settings of instructions via using collaborations that are necessary and instructions that are variational. Fulton (2012) stated that students share concepts and ideas during peer collaboration. They also discuss misunderstandings as well as reflect on the things they have been taught. According to him, learning of students is dependent on such conditions.

Bandura stated that, social learning is also done by adults, hence, they should regard social interaction during their classes. Learning experience can be enriched with interaction of students even though such interaction constitutes a single way of fostering learning. Diversity in learning must be valued by teachers while ensuring implementation of several formats of instruction and assessment (Tomlinson, 2005). This was done to ensure all needs of students are realized.

2.4 Connecting Theories to Learning

Theories of Bandura and Vygostky showed the connection between models of flipped curricula and ensuring improvement in academic work during maths classes in secondary schools. Social stimulation of students is often arrived at with implementation of technology during times of reviewing such technology in a group. Torkelson (2012) stated that, classroom learning with flipped techniques address topics that are covered using the two theories reviewed in literature. Teachers become facilitators who scaffold and provide assistance to students via proximal development of zones.

Alvarez (2012) posited that, major faces of the two theories suggest positive implications of learning socially in relation development of student academics. Bergmann and Sams (2012) asserted that, classrooms that are inverted present students with opportunities to engage socially in academic stuff with their peers.

2.5 Education on Textiles

Teaching is said to be an art. The teacher is simultaneously a conductor, performer, composer, audience and an improviser. Teachers give expression to one's values, beliefs, and intellectual interests, where one works with raw materials to fashion objects of enduring value. Through the art of teaching, teachers develop students' ability to reason and think critically and creatively. Through teaching, the collaborative and communication skills of students and their ability to use a varied form of technology are developed (Smith, 2010). Teachers help students to develop varied perspectives and enhance their appreciation of the differences in opinions and develop the aptitude to relates to others with flexibility and openness of mind. Through the art of teaching, students are able to entertain, persuade, approach issues and communicate their ideas

in novel ways and to make designs with attention to aesthetic considerations. The art of teaching aids students develops students to observation and listening skills thereby enhancing their self-awareness and confidence. They are encouraged to take on risky adventures while solving issues with more creativity and drawing on their relevance.

Education of Kente/traditional loom weaving build confidence, patience, endurance, tolerance, self-control, careful thinking and proper planning in students. Students enjoy and take an active part in practical lessons when teaching and learning involve audiovisuals. Instructional videos in the classroom have the advantage of presenting abstract ideas in a realistic context, which helps learners to grasp the abstract ideas more easily and to retain the material longer. Most practical lessons inculcate into students' essential qualities and skills. We live in a highly technological world as compared to the past, however, technology today is developing much more rapidly and diversely. As society moves toward ever more advanced stages, the impact of technology on society becomes increasingly significant.

2.6 Learning Styles

According to Coffield, Moseley, Hall, and Ecclestone (2004), learning styles refer to a range of competing and contested theories that aim to account for differences in individuals' learning. They further explained that these theories propose that all people can be classified according to their style of learning, although the various theories present differing views on how the styles should be defined and categorized. A common concept is that individuals differ in how they learn (Hughes & Dobolyi, 2015). Every individual has a way or ways of learning best to achieve a result in the classroom. Some learn through audios, pictures, reading, writing, actions etc.

Many scholars have made an attempt to hypothesize methods where theories in learning may be utilized in class. Sprenger (2008) stipulated that an effect should be styles of learning. This means that after using a particular learning style to teach, there should be a change in the behavior of the students.

Although learning styles will inevitably differ among students in the classroom. Teachers are entreated to try making dynamisms to benefit their students in every way. Such dynamisms may include redesigning rooms, developing techniques if small groups as well as developing packages of contract activities (Dunn and Dunn, 1978). Classroom redesign deals with situating reparations which may be utilized in arranging a room in a creative way like adopting several stations for learning as well as areas for instruction while including ideas and thoughts into the class design. There are many different learning styles model but for the sake of the study, four models will be discussed.

2.6.1 Modalities in Learning

Learning modalities are the sensory channels or pathways through which individuals give, receive and store information. Perception, memory and sensation comprise the concept of modality. Waring, further explained that learning modalities are approaches that students utilize in taking on current information as they process, retain and concentrate on the information gotten (Waring, 2018). Such pathway is designed to change the experience of a student for the better as far as the aspects they consider to be difficult are concerned.

Modalities in learning were proposed by Walter Burke Barbe and colleagues in three modalities which are mostly known as VAK. (Barbe, 1979).

These modalities are:

1. Visual modalities

2. Auditory modalities

3. Kinesthetic/tactile modalities

Researchers however arrived at a conclusion that, in every class, students are between 24 and 315 visually impaired or auditory impaired, 14% kinesthetic or 24 to 31% mixed with modalities. In view of this, 30% are expected to remember majority of all that was said in class the previous day while other 30% would retain images of basically what was seen in class (Rose, 1987).

2.7.1 Visual Modalities

These students learn best when they see objects. Such people often need pictures, diagrams, charts, study text-books or even watch documentaries geared at facilitating their understanding of concepts.

Waring (2018) asserted that, such people learn by getting pictures via their eyes.

2.7.2 Auditory Modalities

These learners hear what they are learning to really understand it. They learn when they hear things or via recordings on radio, lecture notes, loud reading or via conversations. Such students enjoy listening to concepts through their ears. They provide positive responses to discussions and lectures.

2.7.3 Kinesthetic Modalities (Tactile modalities)

These students have the tendency of feeling and touching to facilitate their learning process. When movement is added to the learning process, they learn better. Such students learn through hands-on projects like games, the internet and labs or even

through activities like dancing, running and jumping. To reach effectively to all learners in the classroom is to use the modality-based instruction. This consists of using the different modalities to accommodate the needs of all students: that is students who learn through seeing, those who learn through hearing and those who learn through feeling, touching and movement (Rose, 1987) explained that many children employ every bit of their modality to learn. However, some of them may possess weaknesses and strengths that are not usual in some specific modalities. Students whose strength is visual modality may tend to be confused or frustrated when verbal explanations are adopted in the educational system since visual modality is their strength.

2.7.4 Neil Fleming's VAK/VARK model

Fleming is best known worldwide for the design of the VARK model (Leite, Svinicki & Shi, (2009). According to Leite, et al (2010), Neil Fleming's VARK model is expanded upon earlier notions of sensory modalities such as the VAK model of Barbe and colleagues.

Fleming devised a strategy for VARK approach when he noticed that some great teachers were not reaching some students while other poor teachers were (Fleming and Baume, 2006). This made him split the Visual modality in VAK into two parts. These are the Visual (V) and Text which comprises Read/Write (R). This read/write component, add up to give the fourth mode. The four sensory modalities in Fleming's model are:

1. Visual learning

2. Auditory learning

3. Tactile/Kinesthetic

4. Read/write

Fleming claimed that visual learners have a preference for seeing visual aids that represent ideas using methods other than words, such as graphs, charts, diagrams and symbols (Fleming, 2014). According to Kraemer, Rosenberg, Lauren, Thompson and Sharon (2009), Subsequent research has suggested that visual learners convert words into images in the brain and vice versa, but some psychologists have argued that this 'is not an instance of learning styles, rather, it is an instance of ability appearing as a style'.

Students who learn though kinesthetic or tactile method like to do so with expeience by either touching or carrying out an active world exploration. The model may be used to identify the learning technique that students prefer as it maximizes their education by ocncentratign on the advantages related to them. This means that Fleming added read/write modality to the previous VAK model to improve students' learning style in the classroom.

The term 'learning styles' speaks to the understanding that every student learns differently. Individual learning styles depend on cognitive, emotional and environmental factors, as well as one's prior experience. This means that everyone is different. It is important for teachers to understand the differences in their students' learning styles so that they can implement best practice strategies into their daily activities and assessments.

2.8 SAMR MODEL

The SAMR model provides a technique for moving through degrees of technology adoption to find more meaningful uses of technology in teaching and move away from simply using "tech for tech's sake". The SAMR Model for integrating technology into teaching, developed by Dr Ruben Puentedura, has gained a good deal of exposure in

recent years Schrock,(2018). The SAMR model simplifies the common process that people go through when introducing any technology. 'SAMR' is an acronym that stands for Substitution, Augmentation, Modification, and Redefinition.

1. Redefinition: Technology allows for the creation of new tasks, previously inconceivable.

   Technology allows you to do what was previously not possible.

2. Modification: Technology allows for significant task redesign.

3. Augmentation: Technology acts as a direct tool substitute, with functional improvement. Here there is an improvement over what you did without the technology.

4. Substitution: Technology acts as a direct tool substitute, with no functional change.

   This implies technology is used to replace what you might do already, with no actual change.
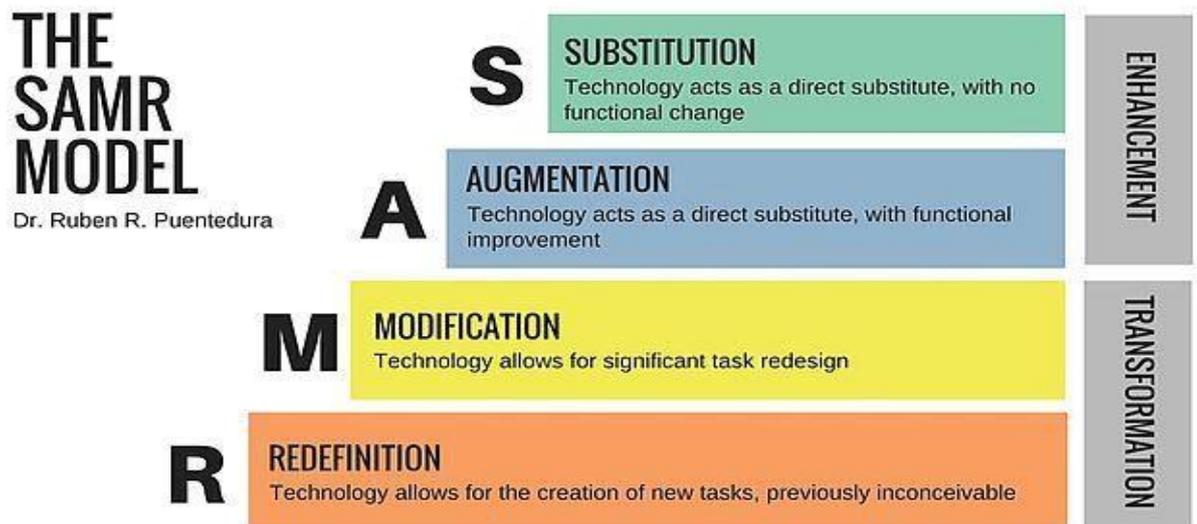
Figure 2.1: A Diagram of SAMR
Source: Schrock,(2018)

2.9 The Technology Acceptance Model (TAM)
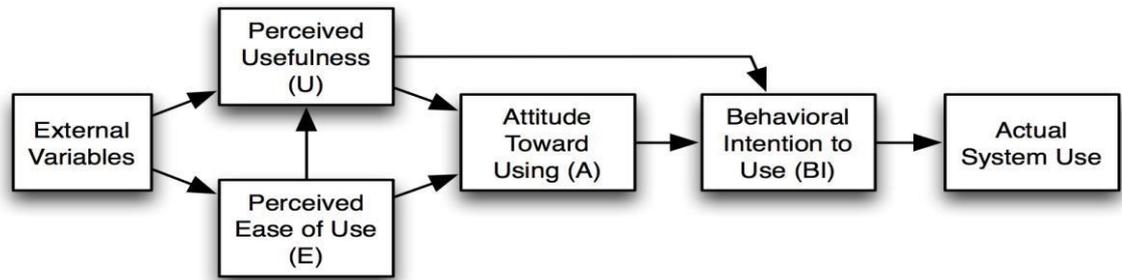
Figure 2.2: A diagram of TAM Source: Bagozzi, Davis and Warshaw (1992)

Davis, Bagozzi & Warshaw, (1989) explained The technology acceptance model (TAM) is regarded as a systems theory of information which shows the extent to users utilize and accept the technology. According to the TAM, some factors affect decision making of students in relation to when and how they would utilize it when they are given new technologies. This included perceived ease of use and perceived usefulness. ATM is known to replace the measures of attitude of TRA even though they both have behavioural variables that are strong.

2.10 Flipped Classroom

According to The Flipped Learning Network, (2014) flipped classroom is a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter. This emphasis that flipped classroom is mostly used in teaching children which makes the teacher a guide on the side but not a sage on stage. According to Alvarez (2012); Bergmann & Sams (2012), concepts that are already recorded are presented by flipped techniques of learning.

Ryback and Sander (1980) asserted that, an instructional technique and a kind of learning that is blended but often reverses archaic learning environments through instructional content delivery is identified as flipped learning. In this kind of learning, activities are moved without leaving out the ones which would have been regarded traditionally. Teachers are often the major focus of attention in traditional modes of learning. They are also the main disseminators of knowledge in the class. Students turn to teachers for guidance as teachers answer every question of their students. Lessons are often concentrated on explaining content used as lecture-styles in classes what utilize flipped techniques.

Instructional materials are watched by students before coming to class and to collaborate with peers and teachers in understanding the material during class. During the time, misconceptions are made clear and the content of the materials are again watched together. Students participating in the flipped classroom lessons are required to complete discuss and complete assignment and extend the concepts that have been learnt from materials that are recording in classes. In view of this, the students' practice in his house, becomes that which is practiced at school.

2.11 The Four Pillars of FLIP

The four pillars of flip are, learning culture, flexible environment, professional educators and intentional contents. In terms of environments that are flexible, a variety of modes of learning are made available. Most of the time, teachers arrange their spaces of learning in accommodating lessons or units while aiming at supporting single studies or group works. Students are often given the opportunity to select where and when they would study. In culture of learning, teachers are considered as the basic information sources. Instructions are often shifted to approaches that are based on the student with

in class period made available to carrying out an exploration of topics in more depth while forming opportunities for learning that are rich. Due to this, students involve themselves in construction of their knowledge since they take part in their studies in ways which are meaningful to them.

Teachers who adopt flipped learning techniques in teaching consider the way they can utilize flipped learning models to aid development of conceptual understanding on the part of students. The materials that students are expected to explore by themselves are determined by their tutors. Their teachers make use of intentional contents to result in maximization of time in classroom to facilitate adoption of student based techniques and techniques in learning that are active with reliance of subject and level of grade. Teachers are tasked with observing their students and ensuring they are given the feedback they need in a moment. Teachers also assess their students based on assignments and homeworks given them.

2.12 Implementation of a Flipped Classroom

Dunn, (2014) has presented six (6) easy steps for implementing flipped classroom. They include plan, records, share, changes, groups and regroup. The first step include, determining the kind of lesson to be flipped in a day. This is followed by recording the lesson or making a video to facilitate comprehension among students. Teachers are expected to send the videos their students while making them involved in the lesson as much as possible. The video should also be clear as much as possible. After identifying their interest in the topic, group them and give them assignments to carry out. Finally, regroup them by getting the entire class to share with their colleagues what they were able to put down. Teachers are entreated to carry out a review, revision and repetition of the whole process to achieve more results (Bergmann and Sams, 2012).

2.13 Importance of flipped classroom

According to Bergman & Sam (2012), flipped learning has a couple of reasons why teachers should consider. These reasons include:

a. Flipping speaks the language of today's students.

b. Flipping helps busy students.

c. Flipping helps struggling students.

d. Flipping helps students of all abilities to excel.

e. Flipping allows students to pause and rewind their teacher.

f. Flipping increases student-teacher interaction.

g. Flipping allows teachers to know their students better.

h. Flipping increases student-student interaction.

i. Flipping allows for real differentiation.

j. Flipping changes classroom management.

CHAPTER THREE

METHODOLOGY

3.0 Overview

This chapter details the methods and techniques that were used in collecting and analyzing valuable data from respondents in satisfying the demands of the study objectives. Thus, the chapter covers research design, sample population, sampling techniques, sample size, types and sources of data, instruments for data collection, and method of data analysis.

3.1 Research Design and Approach

The research design approach adopted for the study is the Mixed Method. This method comprises using both qualitative and quantitative for the research. The mixed-method helps to explore the factors that contributed to the effect of flipped learning on students' academic achievements. It is also useful due to its utilization to gaining more comprehension of flipped learning. As

Creswell (2003) notes, there are six (6) mixed methods design strategies which includes:

1. Sequential Explanatory 2. Sequential Exploratory 3. Sequential Transformative 4. Concurrent Triangulation 5. Concurrent Nested and 6. Concurrent Transformative. The researcher used sequential exploratory strategy because this strategy is useful when developing and testing new instrument. Sequential exploratory is characterized by an initial phase of qualitative data gathering and analysis which is followed by a phase of quantitative data collection and analysis.

Qualitative would be used to answer the research questions. The quantitative research design was adopted through the use of a survey questionnaire in the collection of data.

The quantitative technique involves the collection of data through making measurement. The approach is premix on previous literature, with respect to established principles, and theories which help in deciding the requirements for data for particular research. Measurements (quantified data) are obtained through the use of scientific techniques (Fellows and Liu, 2008). According to Naoum (2007) quantitative research is useful in investigating a social or human problem and is based on testing a hypothesis or a theory composed of variables. Quantitative approaches use measured numbers and are analyzed using statistical techniques, in order to determine whether the hypothesis or the theory is true or not. The samples collected are usually large and can be generalized to a population to some extent so that an interpretation can be made about some attitude, behaviour or a characteristic of the population. Creswell, (2014).

3.3 Research Method

The research method employed is a quasi-experimental design.

3.3.1 Quasi-Experimental Design

The study adopted a quasi-experimental design. According to Creswell (2014), quasi-experimental design is an experimental design involving tests rather than random assignments as is common with most experimental designs. Some other researchers refer to quasi-experimental designs as 'queasy' experiments since they give the experimental purists a queasy feeling as they are usually taken, groups. In its simplest form it requires a pretest and posttest for a treated and comparison group. Thus, the quasi-experiment undertaken involves classroom test that seeks to measure students' performance before and after the introduction of the flipped classroom. Students were tested before the introduction of the flipped classroom and after the introduction of the flipped classroom.

3.3.1 Study Population

The sample population relates to the category of respondents that qualify to be included in the study. The population was made up of Visual Arts students in Presbyterian Senior High School Bompata. This is to examine the extent to which Flipped Classroom can be effective and applied in Senior High schools in Ghana.

3.3.2 Target Population

In view of the quasi-experimental design nature of the study, the target population was made up of Form One (1) Visual Arts students of Presbyterian Senior High School. There are fifty (50) students in the class.

3.4 Sample Size

The sample size relates to the number of respondents that were included in the study. It is the sizeable number of the study population, selected to represent the entire population of the study. For the purpose of this study, the entire number of student population of fifty (50) who are pursuing Visual Arts, and are in first year were used. This is in line with Essel, (2010); Leedy & Ormrod, (2005) that for small population size with fewer than 100, the entire population must be used. However, six (6) of the students were not available to provide reliable responses to the study. Thus, the sample size used for the study was forty-four (44) students. A total of 44 students participated in the pre-tests and the post-tests. The 44 students used for the study in view of the total population is considered statistically representative of the population (Fellows & Liu, 2008).

3.5 Sampling Techniques Employed

Purposive sampling technique was adopted in identifying key respondents of the study. According to Tongco (2007), purposive sampling is a non-probability sampling that is useful in soliciting data from targeted respondents. Presbyterian Senior High School has other students pursuing various courses such as Science, General Art, Business and Home Economics. However, in view of the study objectives and the nature and type of data required, only student pursuing Visual Art was chosen for the study. This is because they are regarded as possessing the relevant information needed in the work.

3.6 Sources of Data Utilized

Both secondary and primary data was used for the study. Primary data is data collected directly collected from source. Primary data used for the study was collected directly from students of Presbyterian Senior High School via the use of questionnaire. Secondary data is data collected from already published documents such as students' academic reports, conference papers,

internet sources.

3.7 Instruments for Data Collection

There are various instruments that are used for collecting data in research work. For the purpose of this study, the researcher adopted the use of questionnaires, pre-test and post-test.

3.7.1 Questionnaires

A questionnaire was designed based on the research objectives with the mind of providing enough background and obtaining the opinions of stakeholders especially students pursuing

Visual Arts. The content and format of the questionnaire were based on the outcome of the literature review on the subject matter. The questionnaire was organized into four sections in line with the objectives as follows: background information, teaching and learning methods, ways of learning, and the flipped classroom. Forty-four questionnaires were administered to the students.

3.7.1 Pre-test and Post-test

In addition to the questionnaire as an instrument of data collection, the study employed pre-test and post-test in gathering data regarding the performance of students after the implementation of the flipped classroom. Students were tested and the respective marks obtained by individual students were recorded prior to the introduction of the flip classroom. The test was followed by the introduction of the flipped classroom teaching and learning models. Students (respondents) were again tested after the introduction of the flipped classroom and the marks obtained by the students were recorded.

3.8 Data Analysis Tools

In order to achieve the aim of this study, the completed questionnaires were analyzed using the SPSS (Statistical Package for the Social Science) software and Microsoft Excel. SPSS is one of the most common statistical packages that is used in the manipulation and analysis of complex data with the use of coded instructions. Descriptive statistics were used in computing frequencies and percentages of the background information of the respondents such as gender, age group, residential status. Additionally, mean values were generated from the data gathered using SPSS.

3.8.1 Test and Dependency and Significance

In order to test for the significant difference between the two post-test and pre-test experiments, the paired t-test was used. The paired t-test also is known as the dependents sample t-test is used to determine whether the mean difference between the two sets of observations (post-test and pre-test) is zero. The differences in the performances of the students before and after the introduction of the flipped classroom were determined using the paired sample t-test.

The statistical significance of the paired t-test is determined by the p-values, which gives the probability of observing the test under the null hypothesis. The lower the p-value, the lesser the likelihood of obtaining results that proves the null hypothesis to be true. A p-value of 0.05 (5%) is used as the limit. Therefore, a p-value below 0.05 proves the alternative hypothesis to be true.

CHAPTER FOUR

RESULTS AND DISCUSSION OF FINDINGS

4.0 Overview

The present section presents detailed analyses of data as well as their presentation in respect to specific objectives of the study. The analysis covers demographic information about respondents, effectiveness of existing instruction methods for teaching and learning methods, the effectiveness of flipped classroom learning as a pedagogical strategy for teaching textile weaving, the effect of the implementation of flipped classroom on students' academic achievement, advantages and disadvantages of flipped classrooms and suggestions for improvements.

4.1 Demographic Data of Respondents

The personal information of participants of the study were analyzed in lieu to the age, gender, and residential status of the respondents.

4.1.1 Gender of Respondents (Students)

Gender of students was analyzed with respect to whether they are male or female. Responses are outlined in Table 4.1.

	Frequency	Percent	Valid Percent	Cumulative Percent
Male	40	90.9%	90.9	90.9
Female	4	9.1%	9.1	100.0
Total	44	100.0	100.0	

Table 4.1: Sex (Students) Source: Researcher's construct from the survey report, 2019

Out of a sample of 44 respondents, 40 of them representing 90.90% are males whiles 9.09% female. This is clearly shown in Figure 4.1

GENDER OF RESPONDENTS (STUDENTS)

9.1%

90.9%
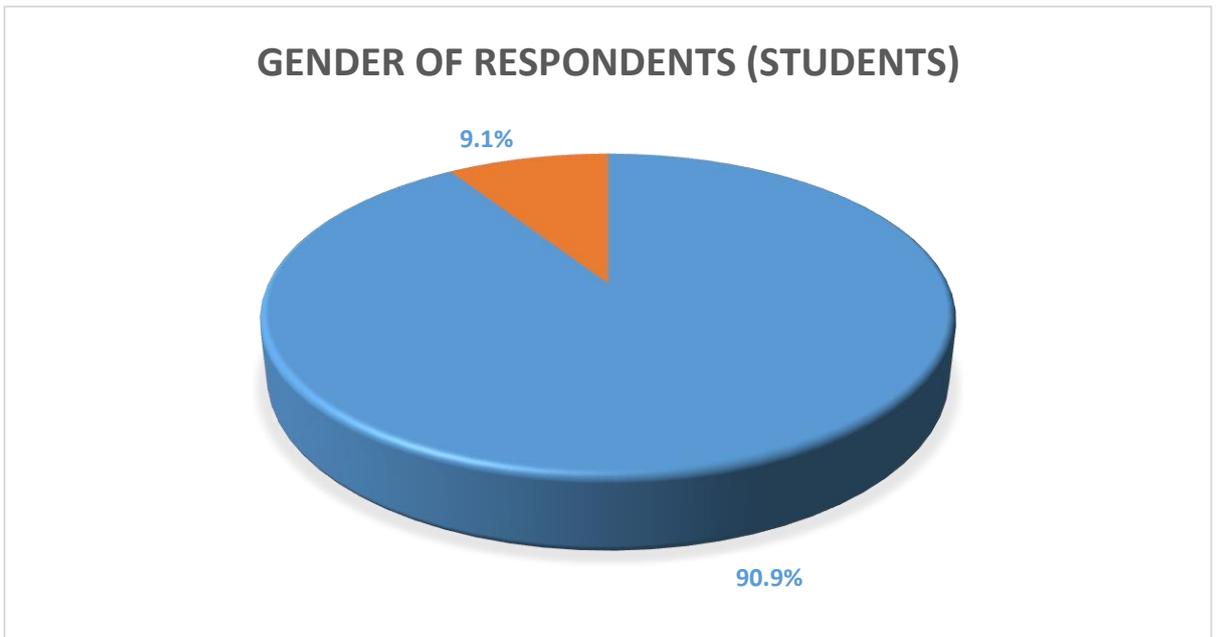
Figure 4.1: Gender of Respondents (Students)

Source: Researcher's construct, 2019

4.2.2 Respondents' Age (Students)

The age of respondents has been grouped into four distinct age groups beginning from

13 to above 21 as shown in Table 4.2.

Table 4.2Age Group of Respondents (Students)

		Frequency	Percent	Valid Percent	Cumulative Percent
	13-15	16	35.6	36.4	36.5
	15-17	17	37.8	38.6	75.0
Valid	17-20	7	17.8	18.2	93.2
	21 and above	3	6.7	6.8	100.0
	Total	43	97.8	100.0	
Missing	System	1	2.2		
	Total	44	100.0		

Source: Researcher's construct, 2019

Table 4.2 shows that majority of respondents representing 38.6% are between the 15-

17 age group followed closely by those between 13 and 15 age group with a proportion

of 36.4%. The lowest proportion of students were 21 years and above. The above

information is further represented in figure 4.2.

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AGE GROUP OF STUDENTS
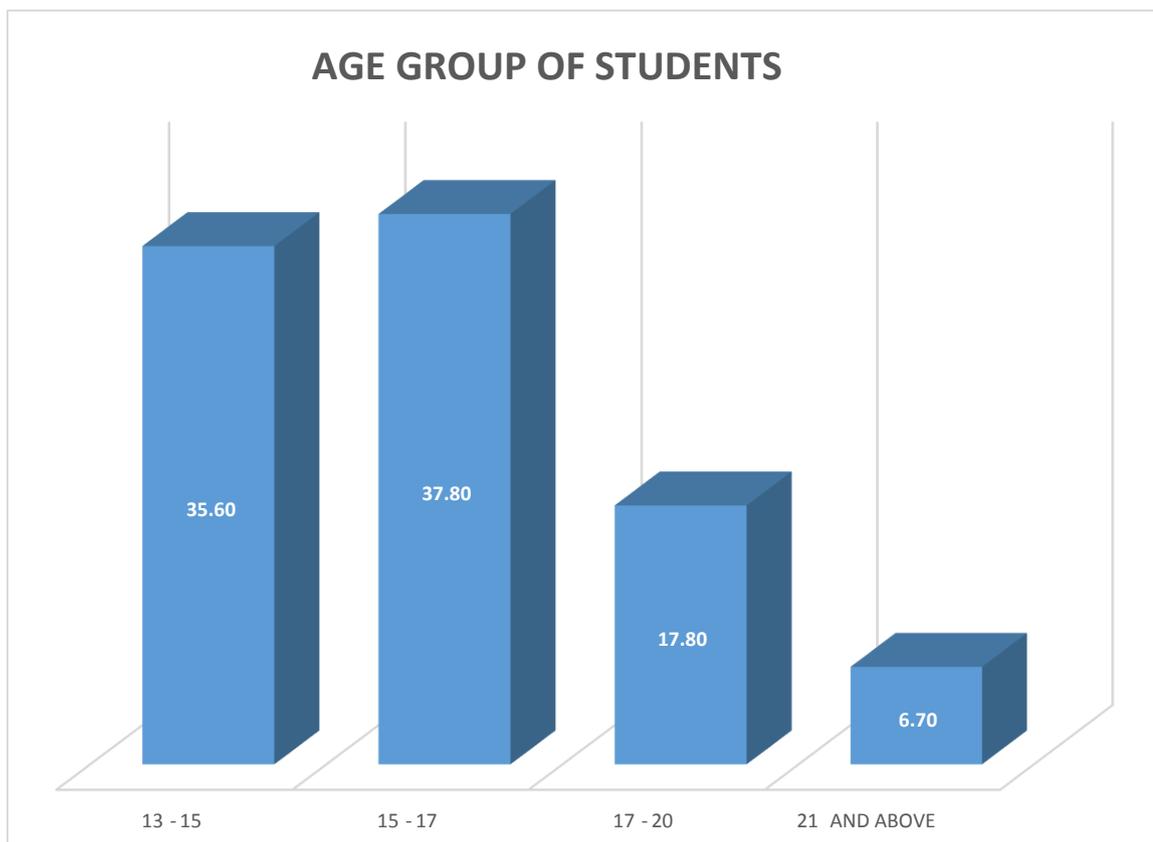
Fig 4.2 Age Source: Construct of Researcher (2019)

As shown by the figure 4.2, the majority of respondents are between the 15-17 age group and those between the 13-15 age group.

4.3 Residential Status of respondents (students)

The residential status of the respondents was analyzed. As shown by Table4.3, most of the respondents, representing a proportion of 64.4% are borders while 35.6% are Day students.

Table 4.3: Residential Status of Respondents

Students' status	Frequency	Percent	Valid Percent	Cumulative Percent
Border	28	64.4	64.4	64.4
Day	16	35.6	35.6	100.0
Total	44	100.0	100.0	

Source: Researcher's construct, 2019

The information provided by the above table is further represented in Figure 4.3 below.
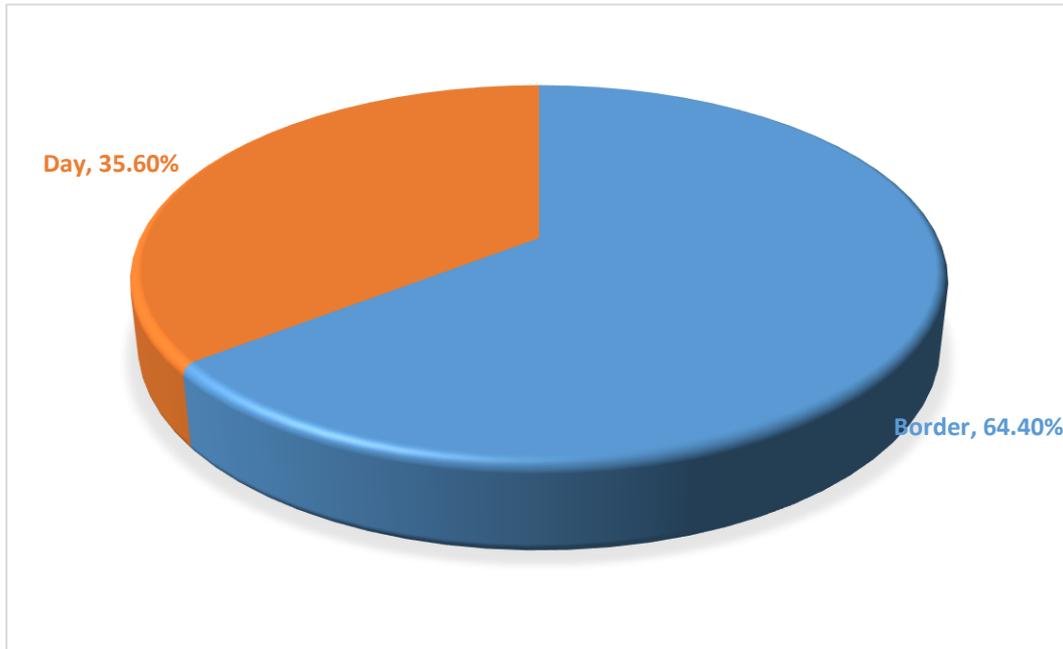
Figure 4.2: Residential Status of Respondents
Source: Researcher's own construction from survey report, 2019.

It can be observed from Figure 4.3 that majority of the respondents are borders. This means that the majority of students who are borders could have access to computers any time the lab is opened. Those who are not staying in school will need their own personal computers at home in order to be able to learn or re-watch videos at home. It should be noted that not everybody in Ghana can afford a personal computer. This may make learning using the flipped classroom difficult for some students.

4.3 The Effectiveness of Existing Instructional Strategy in Learning and Teaching

Effectiveness of existing instructional methods for teaching and learning textile weaving was examined. The results of the analysis as shown in Table 4.4 indicated that respondents disagree that existing teaching method gives attention to each student when teaching as shown by a lower mean value of 1.51 and SD of 0.695. The lower

value of the Standard Deviation shows the extent to which respondents are united with the idea that the existing teaching method gives attention to each student. Additionally, respondent disagrees with the statement that existing instructional methods make use of Teaching and Learning Materials (TLM) as indicated by a mean value of 2.09 (SD=0.701). With a mean value of 3.38 and a standard deviation of 1.072, respondent remains undecided as to whether existing instructional methods reviews previous of knowledge before the beginning a lesson. The higher standard deviation is an indication of the extent to which respondents differ in their opinion on this statement.

Table 4.4: Teaching and Learning Methods and their Effectiveness

Effectiveness of existing instruction methods for Teaching and Learning	Mean	Standard Deviation
The teaching method gives attention to each student when teaching.	1.51	.695
The teaching method involved the use of TLM when teaching.	2.09	.701
The teacher reviews previous knowledge when beginning a lesson.	3.38	1.072
The teaching method allows students the freedom to think.	1.66	.861
Teaching creates a sense of co-operation among students.	1.56	.841
The method allows students to understand the topic clearly.	1.62	.936

Source: Researcher's own construction from survey report, 2019.

Where 0 to 1.49 correspond to 'Strongly Disagree', 1.50 to 2.49 corresponds to 'Disagree', 2.50 to 3.49 corresponds to 'No Comment', 3.50 to 4.49 correspond to 'Agree' and 4.50 and above correspond to 'Strongly Agree').

Respondents further disagree with the statement that existing instructional methods allow students the freedom to think, create a sense of co-operation among students and allow students to understand the topic clearly as shown by a relatively mean (m) values and standard deviation (sd) of 1.66, 1.56, and 1.62 (.861, .841, and .936) respectively.

The results indicated that existing instructional methods do not allow students the freedom to think, do not create a sense of cooperation among students, and do not allow students to understand the topic clearly.

Methods of teaching are very important to academic continuity of students due to the fact that, pathway may be created to carry out influence on the thinking ability of students. Teaching methods used by teachers are essential in the lives of students since they influence the manner in which students view subjects (Saunders, 2014). Weaving is a topic under textiles and being a practical- based topic, the strategy often employed should be demonstration which involves the use of the loom. However, the unavailability of the loom and other weaving accessories in the schools have resulted in the use of lecture and abstract methods for teaching weaving. These methods rather make students passive learners due to the lack of a mechanism to ensure that students are intellectually engaged with materials. This may lead to a dwindling of students interest and desire in the course.

4.4 STUDENT'S PREFERED WAYS OF LEARNING

The alternative to existing traditional teaching and learning methods is learning through practical work, watching TV or videos and using the computer. The responses of students are shown in Table 4.5. From the table, respondents practical work is a Very good way by which students learn as shown by a mean value of 4.52 (SD=.890). This ensures easy comprehension and skills development.

Table 4.5: Ways of Learning adopted in the school

Way of Learning	Listening to the Teacher	Practical Work	Readings books	Watching TV/Video	Using Computer
Mean (m)	2.38	4.52	2.47	4.02	4.00
N	44	42	44	44	44
Std. Deviation	1.051	.890	1.307	.753	.305

Source: Researcher's own construction from survey report, 2019.

(Where 0 to 1.49 correspond to 'Very Poor, 1.50 to 2.49 corresponds to 'Poor', 2.50 to 3.49 corresponds to 'Not sure', 3.50 to 4.49 correspond to 'Good' and 4.50 and above correspond to 'Very Good')

The Table further indicates that respondents (students) watching Videos/TV, and the use of computers are good ways of learning as shown by mean values of 4.02 and 4.00 (SD=.753 and .305) respectively. However, respondents indicated that listening to the teacher and reading books are poor ways by which they learn as shown by lower mean values of 2.38 and 2.47 (SD=1.051, 1.307) respectively. In a country where students are not cultured to the habit of reading, learning methods that involve much reading could posse great challenge to students. Thus, less reading required in the use of the flipped classroom for teaching and learning could prove effective for most students.
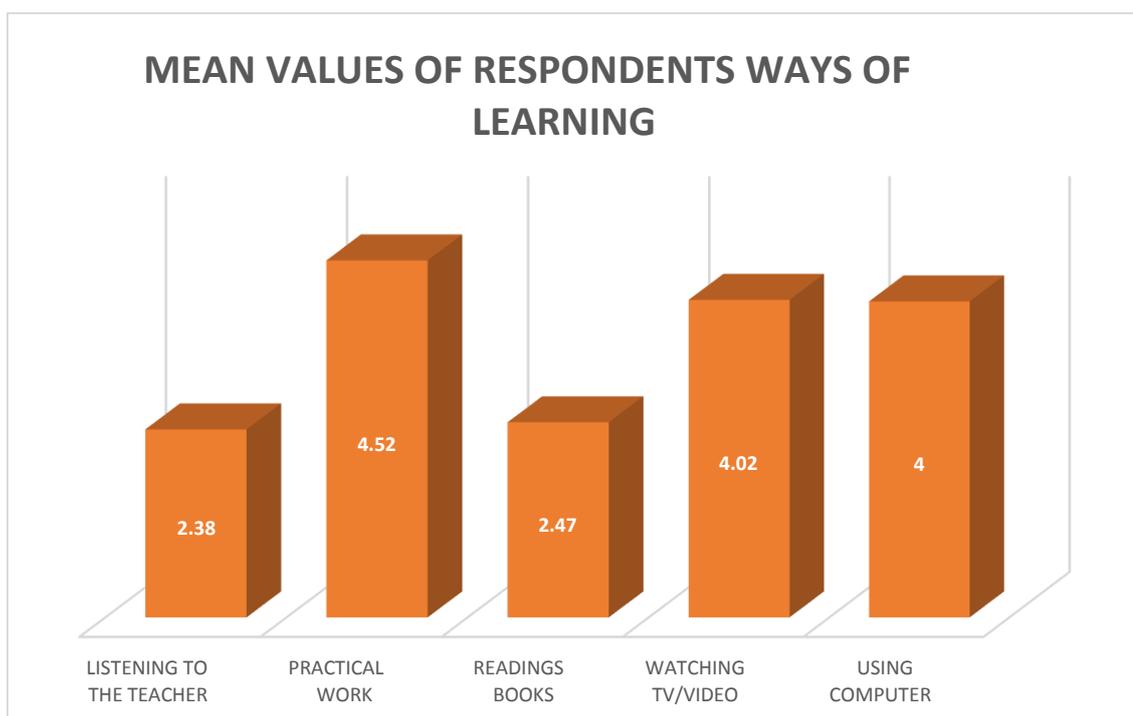
Figure 4.3: Mean values of respondents' ways of learning
Source: Researcher's own construction from survey report, 2019.

Most teenagers enjoy, watching TV or playing with the PC. Instructional methods that involve watching videos and manipulating the computer could be fun and prove to be effective in enhancing teaching and learning. The use of computers which is technology could help the student integrate easily into the technologically changing world. Teaching and learning of weaving under textiles use several methods including discussion method, lecture method, demonstration as well as excursion methods. The generation of today rely more on evolving technologies regularly while interacting with them daily. Just by touching the screen of the smart phone, messages can be checked, social media updates can be done along with registration of courses for school.

4.5.1 The Implementation of Flipped Classroom Model

Learning using flipped techniques encompass techniques and the kind of learning that is homogenized to reverse archaic modes of learning through instructional content delivery. Flipped method of learning shifts activities. This includes the ones that are regarded as traditional. To ensure active participation and inflame the passion of students in the study of weaving amid the challenges of equipment, and materials, there is the need to employ alternative teaching strategies that drive passion and provide the needed engagement such as flipped learning.

STEPS IN IMPLEMENTING THE FLIPPED CLASSROOM MODEL

Before the students were introduced to the flipped classroom, a lesson was organized using the existing teaching strategy. This was followed by a test and the results recorded. (see Table 4.6).

After this, the following steps were followed to implement the Flipped Classroom.

Step one:

The lesson to be flipped was planned on the topic "Weaving accessories and traditional weaving processes" by preparing the lesson notes to be used and also made the videos available for the class. Refer to appendix

Step two:

The videos which contain both pictures and texts for the lesson were made available at the ICT laboratory for the students to watch with the help of the lab assistant. The videos were clear and audible and the duration was 25 minutes. The students were informed that the content of the videos will be fully discussed in class after watching.

Step three:

The students used the 1st Textiles period on their timetable to watched the videos and made their own notes

Step four:

The students were assigned into groups to discuss the content of the video in the classroom using the 2nd Textiles period.

Step five:

The class was organized back together to share the individual group's work with everyone. Questions were asked by the teacher (the researcher) and finally explained the topic deeper by summarizing the content of the videos. After this, a test was conducted based on the lesson (see Table 4.7).

4.5.2 Effects of Flipped Class and Student Academic Performance

The extent which flipped classroom impact student's achievement has been examined. In assessing the effect of the flipped classroom on student's academic achievements, students were given two tests: pre-test and post-test. The pre-test was to examine the performance of students under the traditional instructional methods where students are taught using methods such as lecture method in which students learn in the abstract before the introduction of the flipped classroom. The post-test was aimed at assessing the performance of students after the introduction of the flipped classroom model. In this model, students were made to watch videos on the topic to be treated on their own before the actual day for the lesson. The test was assessed based on a total score of 10. The result was tabulated and frequency tables generated based on the scores obtained by the students as shown in Table 4.7.

Table 4.6: Pre-Tests and Post-Test Scores Obtained by Students

SCORES Obtained (Out of 10)	PRE-TEST		POST-TEST	
	Frequency (No. of Students)	**Percentages** %	**Frequency** (No. of Students)	**Percentages** %
0/10	1	2.3%	0	0
1/10	4	9.1%	0	0
2/10	5	11.4%	0	0
3/10	15	34.1%	2	4.5%
4/10	9	20.5%	1	2.3%
Total FAIL	**34**	**77.3%**	**3**	**6.8%**
5/10	7	15.9%	4	9.1%
6/10	2	4.5%	11	25%
7/10	0	0	6	13.6%
8/10	1	2.3%	10	22.7%
9/10	0	0	5	11.4%
10/10	0	0	5	11.4
Total PASS	**10**	**22.7%**	**41**	**93.2%**

Source: Researcher's own construction from survey report, 2019

From Table 4.6, in the pre-test, one student scored 0 out of 10 and four (4) student scored only 1 out of 10. Five (5) students scored 2 out of 10. Thus, in the pre-test, a total of ten (10) students scored a maximum of 2 out of 10. While in the post-test (i.e. after the introduction of the flipped classroom) however, no student scored 2 out 10. Only two (2) students scored 3 out of 10 in the post-test and one (1) scored 4 out of 10, making a total three (3) students who scored 4 out of 10 and below. In the pre-test, the total number of students who scored 4 out of 10 and below were 34 students representing a proportion of 77.3% failed the test (i.e. assuming 5 out of 10 is the pass mark). In the case of post-test, only a proportion of 3 students representing 6.8% failed

the test. The summary of the scores obtained by the students in the pre-test and the post-test are provided in Table 4.7.

Table 4.7: Summary of Pre-Tests and Post-Test Scores Obtained by Students

	PRE-TEST		POST-TEST	
	Frequency (No. of Students)	Percentages (%)	Frequency (No. of Students)	Percentages (%)
Fail (4 and below)	34	77.3%	3	6.8%
Pass (5 and above)	10	22.7%	41	93.2%
	X^2= 3.373, df = 6, p = 0.182			

Source: Researcher's own construction from survey report, 2019

Table 4.7 indicated that out of 44 students who participated in the pre-test, only 10 students representing a proportion of 22.7% passed the test. In other words, only 22.7% passed the test.

After the Flipped classroom was introduced, the number of students who passed increased from 10 to 41 students representing a proportion of 93.2% (Ref. Table 4.7). Only three (3) students scored below 5 out 10 after the flipped classroom was introduced.

Figure 4.5 gives a clearer presentation of the performance of the students before and after the introduction of the flipped classroom.
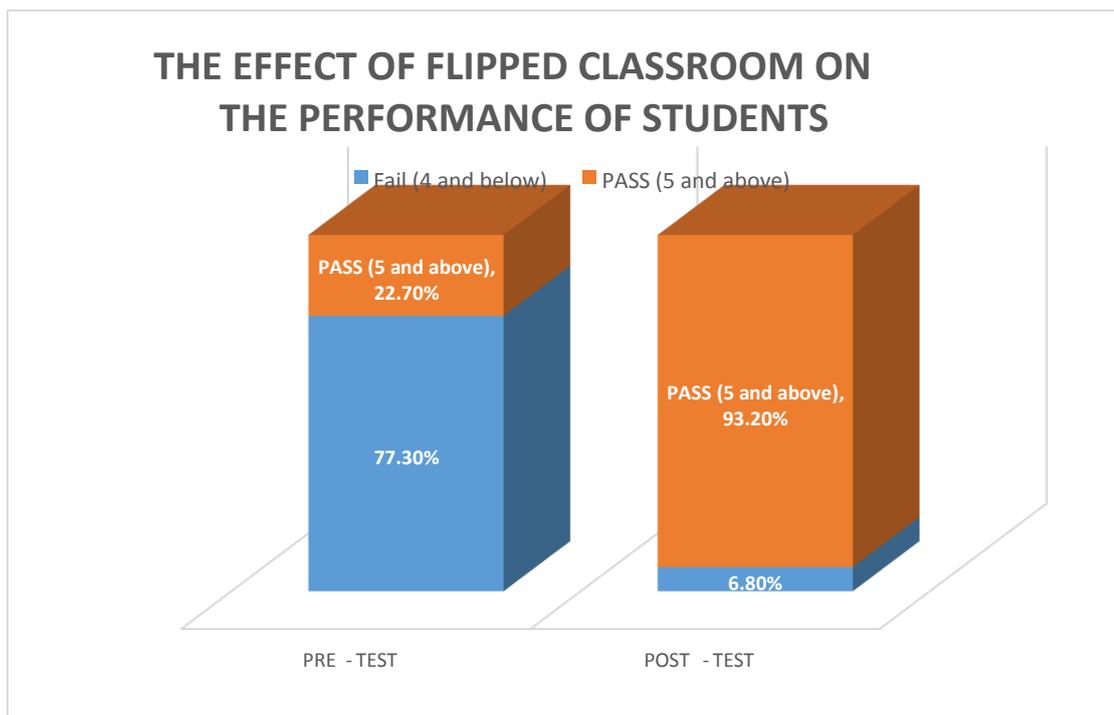
Figure 4.4: The effect of the Flipped classroom on student's performance Source: Researcher's own construction from survey report, 2019

After the pre-test and the post-test section, the students were made to answer the questionnaire and the results discussed in Table 4.8. The section examines the effect of flipped classrooms on the academic performance of students. The result of the analysis is shown in Table 4.8. From the Table, with a mean value of 4.00 (SD=.853) respondents agreed that the flipped classroom teaching model helps to effectively learn to weave in Textiles. Respondents again agreed that flipped classroom setups are helpful in learning as indicated by a mean value of 4.24 (SD=.679). Furthermore, flipped classrooms are said to be more engaging compared with the traditional classroom instructional method as agreed by respondents (mean value = 4.31, SD=.821).

Table 4.8: The effect of the implementation of the flipped classroom on students' academic achievement

Flipped Classrooms	Mean	Standard Deviation
The flipped classroom teaching model helps to effectively learn textiles weaving.	4.00	.853
The class set up is helpful in learning	4.24	.679
The flipped classroom is more engaging than the traditional classroom instruction	4.31	.821
The flipped classroom gives me greater opportunities to communicate with other students.	4.20	.842
Learning how to use a flipped classroom will benefit me in my future education.	3.82	.806
I would rather watch a traditional teacher-led lesson than a lesson video.	2.00	.905
I would not recommend the flipped classroom to a friend.	1.40	.863
The flipped classroom has not improved my learning of textile weaving.	2.04	1.0435
Some sections of the video were re-watched to make a concept clear.	4.27	.688
do you like to incorporate more technology into the class?	3.76	.957
Did you put your best effort in this class?	3.89	.573

Source: Researcher's own construction from survey report, 2019.

(Where 0 to 1.49 correspond to 'Strongly Disagree', 1.50 to 2.49 corresponds to 'Disagree', 2.50 to 3.49 corresponds to 'No Comment', 3.50 to 4.49 correspond to 'Agree' and 4.50 and above correspond to 'Strongly Agree')

Furthermore, a higher mean of 4.20 and 4.27 indicated that respondents agree to the statement that flipped classroom gives students greater opportunities to communicate

44

and interact with other students and that some sections of the video were re-watched to make the concept understandable and clear.

More so students have agreed that learning by using the flipped classroom enhances their future education and that they like the technology aspect of the flipped classroom. This is shown by the higher mean values of 3.82 (SD=.806), and 3.76 (SD=.957) respectively. Most of the respondents also indicated they put in their best effort in the class as shown by a mean value of 3.89 (SD=.573).

Respondents again disagree with the statement that they would rather watch a traditional teacher led lesson than a lesson video (mean value= 2.00 and SD=.905). It has Strongly Disagreed among respondents that they would not recommend the flipped classroom to a friend as shown by a lower mean value of 1.40 (SD=.863).

Class setting in terms of comfort and convenience has an effect on the student's level of comprehension. Uncomfortable set up can distract students and limit their level of comprehension. The level of students' participation and involvement in class enhances their level of understanding and application of lessons learnt in class. The convenience provided by flipped classroom setups, the engagement of students and communication and interaction provided by flipped classroom teaching and learning methods ensures easy understanding by students. According to Abeysekera, Lakmal, and Dawson (2015) flipped classroom is a learner-centred instructional model in which class time explores topics in greater depth and creates meaningful learning opportunities using educational technologies such as online videos are used to 'deliver content' outside of the classroom. In a flipped classroom, 'content delivery' may take a variety of forms. Often, video lessons prepared by the teacher or third parties are used to deliver content, although online collaborative discussions, digital research, and text readings may be used. It has been shown that the ideal length of the video lesson to be is eight to twelve

minutes which reduces boredom. Alvarez (2011) indicated that teacher's interaction with students in a flipped classroom can be more personalized and less didactic, and students are actively involved in knowledge acquisition and construction as they participate in and evaluate their learning.

4.6 ADVANTAGES AND DISADVANTAGES OF FLIPPED CLASSROOMS

In an open-ended question, respondents were asked to suggest some of the advantages and disadvantages of flipped classrooms based on their experience. Responses received have been summarized in Table 4.7.

Table 4.9: Advantages and Disadvantages of Flipped Classroom

Advantages	Disadvantages
Involves the use of technology	Need for a constant supply of electricity
The videos can be watched as many times as possible	Time-consuming
It makes learning easy and flexible	It requires computers and most students do not have computers in the house
Student-centred	Not enough computers in the school
Encourage interaction with other students	It is expensive

Source: Researcher's construct, 2019

Table 4.8 indicates that the use of technology is a major advantage when it comes to utilizing flipped classes as far as learning and teaching textiles weaving are concerned. Other students also said the videos can be watched as many times as possible. This helps to ensure repeated learning. Thus, the students have the opportunity to re-watch the videos the topic again. Additionally, flipped classrooms have been observed by respondents to be student-friendly and make learning easy and flexible. Furthermore, as noted by most students, flipped classrooms encourage communication and interaction among students which makes learning fun. It has been noted that students enjoy communicating with their friends as they learn. Thus, the learning experiences of students are enhanced through their interaction with themselves.

On the other hand, most of the respondents have observed that flipped classrooms require a constant supply of electricity. The means that there cannot class when there is light out. Thus, in the wake of constant power outages, flipped classroom activities might be distracted. It has also been noted by many of the students (respondents) that flipped classrooms are time-consuming. More so, computers are needed for learning when using Flipped Classroom. Not every school has enough computers or laptops to enable learning by means of flipped classrooms. Additionally, most students in Ghana and for that matter Presbyterian Senior High School do not have personal computers or laptops. This limits the student ability to learn while at home.

A section of the students indicated that flipped classrooms are expensive to organize. Thus, some level financial requirements are needed in order to ensure effective teaching and learning using a flipped classroom. The present centralized educational system does not permit the managers (headmasters/mistresses of public schools to charge fees for whatever purpose. Therefore, considering the present educational system and inadequate financial support on the part of the state, the flipped classroom is almost impossible.

The flipped learning constitute settings where an introduction of concepts are recorded. These recordings took the form of videos and audios (Saunders, 2014). Students are however expected to attend class regularly even after watching the videos over the internet to engage in a discussion with their teachers and colleagues on what they learnt.

4.7 SUGGESTIONS FOR IMPROVEMENTS

Respondents were asked of their suggestions as to how the flipped classroom can be improved.

Their responses have been detailed in Table 4.6 as follows.

Table 4.10: Suggestions for improving the Flipped classroom

	Suggestions	Frequency	Percent	Valid Percent	Cumulative Percent
	Equip ICT Lab with more computers	17	37.8	38.6	38.6
	ICT Lab Assistants to be always available	2	4.4	4.5	43.2
	Both	24	55.6	56.8	100.0
	Total	**43**	**97.8**	**100.0**	
Missing	System	1	2.2		
Total		**44**	**100.0**		

Source: Researcher's construct, 2019

From the Table 4.6, 24 of the respondents (students, 56.8%) have suggested that there is the need for both the ICT laboratory to be equipped with more computers and also to ensure that ICT laboratory assistants are always available to facilitate their learning via the flipped classroom. Similarly, 17 of the respondents representing 38.6% indicated that the ICT lab needs to be stored with more computers while only 2 of the respondents representing 4.4% indicated the need for Lab assistant. The above information is further shown in figure 4.6.

SUGGESTION FOR IMPROVEMENT

BOTH — 55.6

ICT LAB ASSISTANCE TO BE ALWAYS AVAILABLE — 4.4

EQUIP ICT LAB WITH MORE COMPUTERS — 37.8
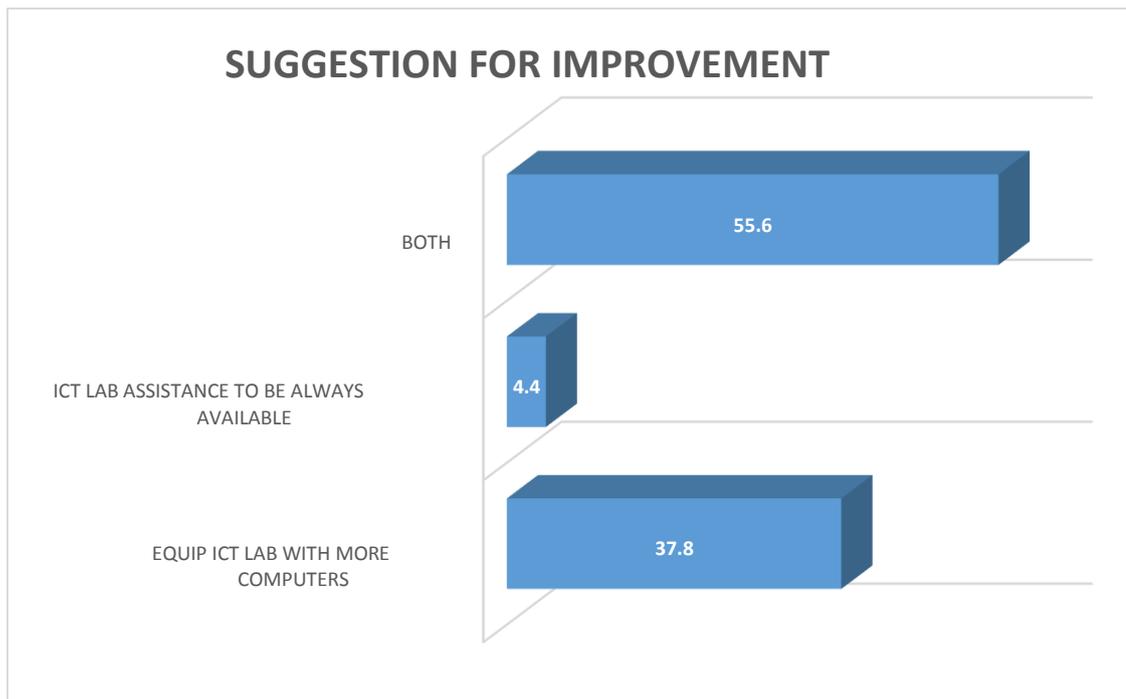
Figure 4.5: Suggestion for improving the effectiveness of teaching and learning using the flipped classroom
Source: Researcher's construct, 2019

As can be seen from Figure 4.5, majority of students suggested the need for the ICT laboratory to be equipped with more computers and for ICT lab assistance to be available always to aid the teaching and learning weaving using flipped classroom. Thus, most of the respondents consider adequate computers in the lab as a requirement for ensuring success in the implementation of the flipped classroom.

Students have become familiarized with IT since students in this era were borne in the computer age. They however make use of this advantage to increase their performance academically. Since passion of students are in line with technology, a positive impact is evident on their academic performance (Louw et al., 2008). Newer teaching methods may incorporate these technologies such as television, radio, internet, multimedia, and other modern devices.

PERCEIVED USEFULNESS (PU) OF THE FLIPPED CLASSROOM MODEL

Flipped classroom model is a technology which is gaining popularity for easy understanding of concepts and ideas during teaching and learning. The flipped classroom made the lesson students centred, minimized the amount of time spent in class on lecturing, the class time was used for active learning. The lesson provides students with more control over their own learning and also provide students with more opportunities to learn from their peers. All these made the lesson clear, understandable, interactive and also flexible for the students.

PERCEIVED EASE – OF - USE (PEU) OF THE FLIPPED CLASSROOM MODEL

This is the extent to which an individual believes that using a particular model be free from stress or effort. The flipped classroom model was easy to operate during the teaching and learning according to the students. It was not difficult when watching and re-watching the video when necessarily say the students.

Access to information is now driven by technology which must be learnt for one to be a competent information user.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Overview

The objective of this study has been to examine the effectiveness of existing teaching and learning strategies and flipped classroom methods in enhancing student performance. The chapter details the summary of findings, conclusion and recommendations of the study.

5.2 Summary

The summary of findings covers the demographic features of respondents, the effectiveness of existing instruction methods for teaching and learning, flipped classrooms learning and its effect on student performances, advantage and disadvantages of flipped classrooms, and suggestions for improvements.

5.2.1 Demographic Features of Participants

In terms of gender, many respondents were males compared with females. Majority of respondents are between the 15-17 age group followed closely by those between 13 and 15 age group. Fewer of the students were 21 years and above. In regard to residential status, the majority of the students are boarders.

5.2.2 The Effectiveness of Existing Instructional Strategy for Learning and Teaching

Effectiveness of existing instructional methods for learning and teaching weaving textiles were examined. As indicated by lower mean values, respondents Disagree that existing teaching method gives attention to each student when teaching, existing instructional methods utilize.

TLMs.

As to whether existing instructional methods reviews previous of knowledge before the beginning of a lesson, respondent remained undecided**.** Respondents further disagree with the statement that existing instructional methods allow students the freedom to think, create a sense of co-operation among students and allow students to understand the topic clearly. The results indicated that existing instructional methods do not allow students the freedom to think, do not create a sense of co-operation among students, and do not allow students to understand the topic clearly.

5.2.3 The Implementation of Flipped Classroom on Students Academic Performance

The result of the analysis shows respondents agreeing that flipped classroom teaching model helps to effectively learn textiles weaving, classroom setups are helpful in learning, and that flipped classrooms are said to be more engaging compared with the traditional classroom instructional methods. Additionally, the flipped classroom gives students greater opportunities to communicate and interact with other students, and sections of the video are also re-watched to make the concept and understanding clear. Learning using the flipped classroom enhances student adaptability to technology which enhances their future education. It was, however, disagreed with the view that they would not recommend the flipped classroom to friends.

5.2.4 The Effect of Flipped Classroom on Student Academic Performance   Summary of Pre-Tests and Post-Test Scores Obtained by Students

Performance of Students	PRE-TEST		POST-TEST	
	Frequency (No. of Students)	Percentages (%)	Frequency (No. of Students)	Percentages (%)
Fail (4 and below)	34	77.3%	3	6.8%
PASS (5 and above)	10	22.7%	41	93.2%
Total	44	100%	44	100%

Only a proportion of 22.7% passes the pre-test while 93.2% of the student passed the post-test, implying flipped classroom teaching and learning methods have a remarkable effect on students' performance.

5.2.5 Advantages and Disadvantages of Flipped Classrooms

The use of technology, re-watching of videos, flexible and easy learning, student-centeredness, and interactions/communication among students have been indicated by respondents as major advantages in the use of flipped classrooms. On the other hand, there is the need for a constant supply of electricity, availability of computers in order for flipped classroom teaching and learning to take place. Acquiring computers could be expensive for the school and for the student as well. Flipped classroom teaching and learning could be somewhat impossible in the absence of a stable supply of electricity.

5.2.6 Suggestions for Improvements

Majority of the respondents have suggested that the ICT Laboratory be equipped with more computers and that Lab assistance be available to aid teaching and learning using the flipped classroom.

5.3 CONCLUSION

The ability of students to develop an interest in a course and subsequently consider pursuing a career in the particular field of study is dependent on how well and likeable the course has been presented to them in respect to teaching and learning method methods. The existing teaching method makes students passive learners due to the lack of a mechanism to ensure that students are intellectually engaged with materials. Flipped classroom teaching and learning method has been found to make teaching and learning easier and fun for students due to its student centeredness and the use of modern technology which most students have found very adaptable.

The findings of the study showed a remarkable improvement in students' academic performance through the introduction of the flipped classroom as instructional method compared with the traditional method of teaching and learning. However, adequate computers and constant supply of electricity are required in order to undertake flipped classroom teaching and learning. It has been suggested that the ICT lab be furnished with adequate computers and lab assistants be available in order to ensure effective use of flipped classroom as an instructional method.

5.4 RECOMMENDATIONS

In view of the findings of this study, it is recommended that flipped classroom teaching and learning method, be adopted by the school as a method of teaching practical based subjects so as to involve students in class activities. This is because the flipped classroom enhances student understanding and performance in class.

In-service training on the use of Flipped Classroom should be organized by the school for instructors handling practical based subjects in order to effectively carry out teaching and learning activities.

Additionally, the computer laboratory needs to be equipped by the government with more computers so as to enable more students to have access to computers during teaching and learning sections.

Furthermore, the current power supply is not stable. Therefore, there will be the need for a stand by generator by the school in order to ensure that teaching and learning activities using the flipped classroom continues without distractions caused by frequent power outages.

5.5 Suggestions for Further Studies

Further studies can be carried out on the extent to which the various educational stakeholders are willing and prepared to support the flipped classroom teaching and learning method financially. Other areas such as the effect of the flipped classroom in some other elective subject areas including; Leatherworks, Picture making, Ceramics and so on.

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APPENDIX I: Questionnaire for the respondents.

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
COLLEGE OF ART AND BUILT ENVIRONMENT
SURVEY QUESTIONNAIRE

This questionnaire and response of students is a survey on the introduction of the flipped classroom and its effect on students' academic achievements in Textile weaving. It will assist the teacher in catering for the learning needs of students at the school. The questionnaire should only take 5-10 minutes to complete.

INSTRUCTIONS

This questionnaire has three sections. Please put a tick in the box to the answer of your choice or write in the space provided as the case may be.

Background Information

1. Sex   Male [ ]   Female [ ]

2. Age   13-15 [ ]   15-17 [ ]   17-20 [ ]   21 & above [ ]

3. Residential status: Border [ ]   Day [ ]

Teaching and learning method

Tick your preferable choice

1. Strongly disagree **2**. Disagree, **3**. Undecided, **4**. Agree, **5**. Strongly Agree

	1	2	3	4	5
1. The teaching method gives attention to each student when teaching.					
2. The teaching method involved the use of TLM when teaching.					
3. The teacher reviews previous knowledge when beginning a lesson.					
4. The teaching method allows students the freedom to think.					
5. Teaching creates a sense of co-operation among students.					
6. The method allows students to understand the topic clearly.					

Students learn things in many different ways. Below are a number of ways of learning something each with its own five-point scale. Circle your preferable choice/s.

Way of learning	V. poor	Poor	Not sure	Good	V. good
4. Listening to the teacher	1	2	3	4	5
5. Practical work	1	2	3	4	5
6. Reading books	1	2	3	4	5
7. Watching TV/Video	1	2	3	4	5
8. Using a computer	1	2	3	4	5

Flipped classroom

Please thick the most appropriate response.

A. Strongly disagree, **B**. Disagree, **C**. Undecided, **D**. Agree, **E**. Strongly Agree

	A	B	C	D	E
9. The flipped classroom is a new teaching model in textiles class, do you feel that it helped you learn textiles weaving?					
10. Was the class set up helpful in your learning?					
11. The flipped classroom is more engaging than the traditional classroom instruction					
12. The flipped classroom gives me greater opportunities to communicate with other students.					
13. Learning how to use a flipped classroom will benefit me in my future education.					
14. I would rather watch a traditional teacher-led lesson than a lesson video.					
15. I would not recommend the flipped classroom to a friend.					

16. The flipped classroom has not improved my learning of textile weaving.					
17. Some sections of the video were re-watched to make a concept clear.					
18. Do you like to incorporate more technology into the class?					
19. Did you put your best effort in this class?					

20. What is the advantage(s) of the flipped classroom?

…………………………………………………………………………………………
………………

…………………………………………………………………………………………
…………

21. What is the disadvantage(s) of the flipped classroom?

…………………………………………………………………………………………
………………

…………………………………………………………………………………………
…………

22. What improvements would you recommend in the flipped classroom?

☐ ICT lab should be well equipped with more computers

☐ ICT lab assistant should be always available for students

☐ Other……………………………………………….

Thank you very much for taking the time to complete this questionnaire!

APPENDIX II

Pre-Test and Post-Test Questions

PRE-TEST QUESTIONS

1. What is weaving?

2. What are the following used for;

    a. Reed

    b. Bobbin

    c. Warping mill

3. Compare the broadloom and kente loom and the weaves they produced.

4. Write short notes on the following;

    a. Warping

    b. Beaming

    c. Heddling

    d. Reeding

    e. Tie-up

POST- TEST QUESTIONS

1. Draw and explain the following weaving accessories;

    a. Bobbin

    b. Shed stick

    c. Shuttle

2. What are the three basic weaves?

3. State and explain the processes involved in traditional weaving.

4. Explain the three primary motions of weaving.

APPENDIX III

Presentation of weaving lesson using the traditional method of teaching

Teaching and learning in the classroom

Teaching and learning in the classroom

Students watching the videos at ICT Lab.

Projector showing aspect of the videos

Students watching the videos on a projector

WEEK ENDING: 3ᴿᴰ DECEMBER – 7ᵀᴴ DECEMBER, 2018

SUBJECT: TEXTILES

REFERENCES: 1. TEACHING SYLLABUS FOR TEXTILES BY WAEC/GES

2. LESSON NOTES ON TEXTILES FOR GHANAIAN SCHOOLS AND COLLEGES BY JOSEPH SACKEY

3. ART FOR SCHOOLS AND COLLEGES BY S. ADU AKWABOA

4. INTRODUCTION TO TEXTILES FOR SHS BY K. ADU OFFEI

DAY/DURATION	TOPIC/SUBTOPIC	OBJECTIVES/RPK	TEACHER & LEARNER ACTIVIES	TEACHING & LEARNING MATERIALS	CORE POINTS	EVALUATION & REMAARKS
MONDAY 03/12/18 60 minutes	**TOPIC** Looms and accessories	**OBJECTIVES:** By the end of the lesson, the student will be able to: 1. Explain weaving/loom	**INTRODUCTION** Teacher revises the relevant previous knowledge with students by asking them to define a loom and the types. **T L A** 1. Teacher leads a class discussion on weaving/loom accessory.	Marker board illustrations	**WEAVING ACCESSORY** It is an essential device that is not necessarily a component part of the loom	State and explain five (5) weaving accessories

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| | | SUB-TOPIC

Weaving accessories and uses | Accessory.

2. Describe the different types of weaving accessories and their uses.

RPK
Students have learnt types of looms | 2. Teacher demonstrates Different types of weaving accessories for students to discuss their uses.

3. Teacher guides students to draw the weaving accessories. | | structure but used as supplement in the weaving operations.

TYPES OF WEAVING ACCESSORIES
Shuttle, spool rack, raddle, warping mill/board, skeiner, bobbin winder, warp sticks etc. | <u>**REMARKS**</u> |

WEEK ENDING: 25TH MARCH – 29TH MARCH, 2019

SUBJECT: TEXTILES

REFERENCES: 1. TEACHING SYLLABUS FOR TEXTILES BY WAEC/GES

2. LESSON NOTES ON TEXTILES FOR GHANAIAN SCHOOLS AND COLLEGES BY JOSEPH SACKEY

3. ART FOR SCHOOLS AND COLLEGES BY S. ADU AKWABOA

4. INTRODUCTION TO TEXTILES FOR SHS BY K. ADU OFFEI

DAY/DURATION	TOPIC/SUBTOPIC	OBJECTIVES/RPK	TEACHER & LEARNER ACTIVIES	TEACHING & LEARNING MATERIALS	CORE POINTS	EVALUATION & REMAARKS
TUESDAY 26/03/19 120 minutes	**TOPIC** Looms and accessories	**OBJECTIVES:** By the end of the lesson, the student will be able to:	**INTRODUCTION** Teacher revises the relevant previous knowledge with students by asking them to mention some weaving accessories and their functions **T L A** 1. Students were asked to go to the ICT laboratory to watch a video on traditional weaving processes.	A video on traditional weaving processes. Marker board illustrations.	**TRADITIONAL WEAVING PROCESSES:** Warping, Heddling,	5. State and explain the processes involved in traditional weaving.

	SUB-TOPIC Traditional weaving	1. Describe the traditional weaving processes.	2. Students were grouped into four after watching the video to discuss the content of the video. 3. Teacher guides students to share the individual group's work by organizing the class back together.		Reeding, Tying-up, Weaving.	6. Explain the three primary motions of weaving.
		2. Distinguish between the loom motions	4. Teacher leads a class discussion on weaving accessories and processes.		**LOOM MOTIONS** Shedding motion, Picking motion and Beating motion.	**REMARKS**
		RPK Students have learnt weaving accessories				