AN INVESTIGATION OF TECHNOLOGICAL PEDAGOGICAL AND CONTENT KNOWLEDGE OF VISUAL ART TEACHERS IN SELECTED SENIOR HIGH SCHOOLS IN KUMASI METROPOLIS

By

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DECLARATION

I hereby declare that this submission is my own work towards the MPhil Art Education degree and that to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the university, except due acknowledgement has been made in the text.

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DEDICATION

To all 10K-GH Group of Companies Staff and my Family

ABSTRACT

A lot of studies on TPACK for teachers has been done concerning the integration of technology in classroom instructions on different. But the problem is, there hasn`t been any studies done concerning the TPACK of Visual Art teachers in Ghana., Therefore the research sought to investigate the TPACK of Visual Art teachers in Kumasi Metropolis to investigate the Technological Pedagogical and Content Knowledge (TPACK) of Visual Art Teachers in Kumasi Metro to find out their efficient use of technologies, Competences of technology and Barriers preventing them in integrating technology in the teaching of the visual art subjects. TPACK is Knowledge of various technology-oriented teaching approaches that can be used to deliver subject matter. In view of this, Research questions were formulated based on the objectives of the study. The objectives are: 1.To investigate the access to Technology by Visual Art teachers in Kumasi Metropolis 2. To examine the level to which Visual Art teachers in Kumasi Metropolis use Technology for classroom activities 3.To examine the competences of technology integration by Visual Art teachers in Kumasi Metropolis 4.To explore the barriers and concerns preventing technology integration by Visual Art teachers in Kumasi Metropolis. Qualitative research method based on descriptive survey design was used for the study. Questionnaire was formulated based on Technological Pedagogical Content Knowledge (TPACK) Questionnaire serving as an instrument for testing the Visual Art teachers in Kumasi Metropolis. Four public Senior High Schools in Kumasi Metropolis were selected for the study. The population for the study was 30 respondents to fill out the questionnaire which was formulated. Statistical Package for Service Solution (SPSS 21.0) and Graphical representations of Charts and tables were used to analyzed the data. The research found out evidently that, Visual Art teachers of Kumasi Metropolis have the technological knowledge and they are able to access technology on their own. It was also found that, the absence of Technological Pedagogical Knowledge (TPK) and Technological Content Knowledge (TCK) of Visual Art teachers in Kumasi Metropolis is low, this means that the Visual Art teachers would receive instructional teaching methods that are without digital devices and they will dwell more on textbooks to present their subject matter. The research also found that, Visual Art teachers Technological Pedagogical Content Knowledge (TPACK) is moderately low due to this the competences of using technological tools or devices to integrate technology into classroom pedagogy and content is low and this is actually going to hinder their success in subject delivery. In respect to these findings, it was recommended that, The Teacher Training Institutions (UEW, UCC, KNUST) ought to restructure their course programs to help Visual Art teachers improve more on their Technological content Knowledge. Again, The Government of Ghana together with GES should capitalize on this research provide frequent workshop for Visual Art to aid them on how the can easily integrate technology into their classroom instructions.

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LIST OF ACRONYMS

KSTS – Kumasi Secondary Technical School

TK – Technological Knowledge

TPK – Technological Pedagogical Knowledge

TCK – Technological Content Knowledge

TPCK – Technological Pedagogical Content Knowledge

KNUST SHS – Kwame Nkrumah University of Science and Technology Senior High School

KNUST – Kwame Nkrumah University of Science and Technology

SHS – Senior High School

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

The rise of digital citizens and computerized migrants has modified the strategy to classroom management. Classroom management is presently viewed as by a hurrying of instructional technologies intended to multiply effectiveness, grow profitability, and in the end improve students' all out learning encounters. Today, study classroom instruction is not just reliant on the substance and educational information of the teacher yet in addition on the mechanical learning of the instructor and his or her capacity to utilize innovations, for example, wikis, web journals, introductions, Google classroom and YouTube recordings for instructional related purposes all through the teaching space. These innovations, to a huge degree, have an equivalent association with educating and learning.

When the innovations of technology are analyzed, it is seen that they are on the areas of pedagogy, human and performance (Fording, 2006). It is stated that positive results that technology will bring to education are not only enough with technological changes (Koehler & Mishra, 2005), but also this situation of teachers using technology can possibly change the training (Carr,Jonassen, Litzinger & Marra, 1998). According to Shulman (teacher efficiencies should have information headings like field information, pedagogic information, pedagogic field information, curriculum information, teacher quality information, educational context information, educational prints,

In any case, an alternate finding was introduced in an examination by Jang and Tsai (2012) who found that TPACK of basic science and arithmetic instructors demonstrated no substantial sex variances per the usage of technology. It was against this background

that this work intended to investigate the (TPACK) of Visual Art Teachers in Kumasi Metro to find out their efficient use technologies, Competences of technology and Barriers preventing them in integrating technology in the teaching of the visual art subjects**.** It is therefore important Visual Art teachers in some selected schools in Kumasi Metro are surveyed so as to fill the distinguished hole in the writing. The TPACK structure serves as the theoretical structure for this examination. This section centers around the foundation to the study, statement of the issue at hand, reason of the study, objectives, the study questions, and importance of the study, delimitation and limitations of the study, operational meaning of terms and arrangement of the research.

1.2 Statement of the problem

Jonassen, Howland, Marra, and Crismond (2008) contend that single direction of building up learners' 21st century talents is to draw in "Important Learning with ICT". This alludes to learning encounters in which ICT apparatuses are utilized to help learners in their request, information development, and coordinated effort as they chip away at genuine issues

A lot of studies on TPACK for teachers has been done concerning the integration of technology in classroom instructions on different courses (Gao, Choy, Wong, & Wu, 2009; Hayes, 2007; Ward & Parr, 2010). But the problem is, there hasn`t been any studies done concerning the TPACK of Visual Art teachers in Ghana. These outcomes propose that Visual Art teachers may not have the sorts of TPACK explicit for structuring significant learning with ICT. This means Visual art teachers in most Senior High Schools in Ghana don't view themselves as adequately prepared to utilize technology in the classroom and regularly don't value its worth or pertinence to instructions and learning

In Ghana for example, Agyemang (2012) develop from his research that instructors preparing projects don't stress the information to blend technology, instructional method and contents, this makes instructors incapable in instructing through ICT. Therefore the research sought to investigate the TPACK of Visual Art teachers in Kumasi Metropolis to investigate the Technological Pedagogical and Content Knowledge (TPACK) of Visual Art Teachers in Kumasi Metro to find out their efficient use of technologies, Competences of technology and Barriers preventing them in integrating technology in the teaching of the visual art subjects.

1.3 Objectives of the Study

The objective of this study is:

1. To investigate the access to Technology by Visual Art teachers in Kumasi Metropolis.
2. To examine the level Visual Art teachers in Kumasi use Technology for classroom instructions.
3. To examine the competences of technology integration by Visual Art teachers in Kumasi.
4. To explore the barriers preventing technology integration by Visual Art teachers in Kumasi.

1.4 Research Questions

The following research question guided the study

1. To what extend are Visual Art teachers in Kumasi Metro accessing technology?

2. To what level are Visual Art teachers in Kumasi Metro using Technology for classroom instructions?

3. What are the competences of technology integration by Visual Art teachers in Kumasi Metro?

4. What are the barriers preventing technology integration by Visual Art teachers?

1.5 Purpose of the study

The research aims at investigating the TPACK of Visual Art Teachers in some selected Senior High schools in Kumasi Metropolis to know their efficient level of Technology in teaching Visual Arts and developing the interest of the students in the learning of Visual Art, which will bring to bear the understanding of the subject and to find out their efficient use technologies, Competences of technology and Barriers preventing them in integrating technology in the teaching of the Visual Art subjects.

1.6 Significance of the study

1. The research concentrated on Visual Art Teachers' Technological Pedagogical Content

Knowledge level. Its findings will have much significance on the TK level of Visual Art

Teachers

2 The findings will help to know the competences and the barrier hindering the integration of technologies into instructional teaching content

3 Again, the discoveries of the investigation would make mindfulness among Visual Art Tutors the information they need for successful instructing in this 21st century. In respect

to this, their technological skills is likely to be awaken.

4 College of Education Studies on the courses they should approve and run for Visual Art

Teachers. It will help to know the relevance of technology in the training of Visual Art

Instructors.

1.7 Delimitation

The study centers around Technological Pedagogical Content Knowledge of Visual Art teachers some selected schools in Kumasi Metro.it would have been appropriate to conduct this research in all private and public second cycle institutions in Kumasi Metro but the researcher selected four public senior high schools which included these public Senior High School (K.S.T.S , KNUST SHS, ADVENTIST DAY SHS and Asanteman Senior High School).

1.8 Limitation

Per the generality consensus of the discoveries to the investigation, the fact remains that the relatively defined sample might not be huge enough to authorize the generalization of the results to other senior high schools in the Kumasi Metro or Visual Art teachers in Ghana or to other countries in Africa. As such, the findings to the study are generalized to only the population of the study. On the instrument, which is the questionnaire inquire about dependent for survey does not give inside and out data (Johnson & Christensen, 2012). This infers that the outcomes would have been more top to bottom and exact if respondents were met since the specialist could have gotten the opportunity to pose further inquiries for the clarification of reactions.

Furthermore, the instrument was comprised of fundamentally close-finished things. This implies respondents were compelled to take choices on the things without permitting them space for their very own reactions. This may have also resulted in loss of some vital information that the research may not have covered. In order to cater for this limitation, the questionnaire was comprehensive enough to ensure that most vital issues were covered.

Due to network connectivity too, the researcher couldn't get the way teachers should have answered the e-questionnaire, in view of this, teachers were forced to answer questionnaire manually.

1.9 Operational definition of terms

Students: The participant during teaching and learning process.

Technology: Emergent digital devices that can aid the teaching and learning process.

Technological knowledge (TK): Knowledge on emerging digital technologies.

Technological Content Knowledge (TCK): Knowledge of how to use emerging digital technologies to teach the subject matter.

Technological Pedagogical Knowledge (TPK): Knowledge of the existence, components and the capabilities of various technologies and how they can be applied in the teaching and learning process.

Technological Pedagogical Content Knowledge (TPCK): Knowledge of various technology-oriented teaching approaches that can be used to deliver subject matter.

1.10 Organization of the Study

The investigation is composed in five sections. Chapter one covers the introduction of the study which centres on the background to the study, statement of the problem, purpose of the study, research questions, significance of the study, delimitation of the study, limitations of the study, and operational definition of terms. Chapter Two presents the review of related literature, with emphasis on conceptual framework as well as related empirical studies on the research questions that guided the study. Details of the method that was used in the investigation was presented in Chapter Three. This includes the research design that was employed, population, sample and sampling procedure, instrumentation, data collection procedures and method of data analysis. The fourth chapter presents the results of the data analysis.

The chapter further discussed the results and the findings of the study. The final chapter, Chapter Five, summarizes the study to draw conclusions. Based on the conclusions, recommendations have been made to help identify and investigate TPACK of visual art teachers in selected senior high schools in Kumasi Metro.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.0 Overview:

This part accentuations on the review of literature that relates to this study. The review of related literature allows a comparison of the concerns and results of the researcher study and similar pieces other research work to provide basis for accepting or refuting earlier conclusions. The conceptual framework for the study is discussed first. Empirical studies considered necessary for putting the main problem and the sub-problems in perspective are also discussed. For the purpose of clarity and simplicity, the review has been organized under the following sub-topics:

1. Conceptual Framework
2. Historical Background of the TPACK framework
3. Instrument for measuring TPACK
4. Components of the TPACK framework
5. Barriers that affect technology integration
6. Teachers competencies in technology integration
7. Empirical Review

2.1 Conceptual Framework for TPACK

The research focused on the TPACK structure concept of Koehler and Mishra (2006), additional awareness fields in teaching suggested by Shulman (1986). To better understand the TPACK framework and its components, it is first important to consider the historical development of the framework.

2.2 Historical Background of the TPACK Framework

The Pedagogical Content Knowledge (PCK) framework theorized by Shulman (1986) has been expounded by numerous scientists particularly in the principal era of the 21st Century because the decade has seen the emergence and availability of new digital technologies which have gained importance in the teaching and learning process. Although technology (textbooks, overhead projectors and others) was in existence when Shulman propounded his knowledge base for teaching, innovational issues were not imagined to the degree that they are today (Koehler & Mishra, 2006). In an increasingly present point of view, the term technology commonly refers to digital computer technologies, artefacts, and mechanisms employed in undertaking any endeavour. The development of these computerized innovations in instruction has changed the learning condition, or if nothing else, it can possibly do as such.

Along these lines, what has transformed from the Shulman approach that was propounded during the 1980s is the prerequisites for figuring out how to apply innovation in teaching. So as to meet this necessity, Shulman's idea of PCK has been expounded by numerous analysts in the most recent decade (Savas, 2011).

The term TPACK first showed up in the writing in the year 2006, when Mishra first referenced the possibility of TPACK with regards to instructive programming plan (Savas, 2011). Mishra, hence, united various issues which are frequently contemplated freely. The issues which were brought into a similar bundle were the idea of the space and its connection to instructive hypothesis and the procedure of plan and assessment of PC programs. In a word, Mishra (1998) established the framework of the possibility of TPACK by referencing the joining of substance, hypothesis and innovation. Pierson (1999, 2001) uncovered the nearest diagrammatic conceptualization of TPACK to the contemporary graph of TPACK. In that graph, there was the presentation of innovation information which Pierson (2001) characterized as "essential innovation competency as

well as a comprehension of the one of a kind qualities of specific sorts of advances that would loan themselves to specific parts of the instructing and learning process". Therefore, Pierson (2001) made a case that educators don't just need information on the topic they instruct and how to show it however there was the need to discover approaches to mix this learning base with innovation. Fundamentally, there meant that there was the requirement for educators to have a broad substance information and instructive information joined with innovation information so as to coordinate innovation viably in the educating and learning process. This, Pierson portrayed as "genuine innovation joining". In this manner, as ahead of schedule as the main decade of the 21st Century, there was the worldwide call for instructors to discover approaches to coordinate innovation in the educating and learning process (Chapman &Mahlck, 2004). In facilitation to the worldwide promotion of innovation reconciliation in instructing and realizing which had begun as right on time as 2001, Gunter and Baumbach(2004) upheld "educational program coordination" which is clarified as the successful combination of innovation into the educational program to meet the objectives of the educational program units and managed PC proficiency, data education, and incorporation education. On his part, Hughes (2004) likewise presented the expression "innovation integrationists". By "innovation integrationists", he implied the capacity of an educator to comprehend, consider, and use advancements just when they improve the educational plan, guidance and understudy understanding in a one of a kind way. In perspective on this, Hughes supported four standards through which innovation integrationists can be brought from up in administration and pre-administration training. These standards are: associating innovation figuring out how to proficient information; benefit topic and educational substance associations, utilizing innovation figuring out how to challenge current expert learning, and showing numerous advancements. In this manner, Hughes did not just

prescribe the requirement for joining innovation in educating or adapting however additionally proposed the rules that would prompt the improvement of educators, and position them for viable innovation coordination. Angeli and Valanides (2005) likewise estimated the thought "innovation reconciliation", however with an alternate mark in understanding to Information and Communication Technology (ICT) identifying with PCK. In Angeli and Valanides' hypothesis, educators were required to have information that would make them consolidate substance, instructional method and ICT viably. The ICT-related PCK idea comprised academic information, branch of knowledge learning, information of understudies, learning of ecological setting and ICT learning. Much the same as Hughes (2004), Angeli and Valanides (2005) gave five standards as a manual for structure ICT-upgraded realizing which were considered as indistinguishable measurements.

These measurements were to: distinguish themes to be educated with ICT, recognize portrayals to change the substance, recognize showing systems, select ICT apparatuses to manage the cost of substance changes and bolster showing techniques, and imbue ICT exercises in homeroom guidance (Angeli &Valanides, 2005). Around the same time (2005), Guerrero uncovered that writing decently extends numerous things that the matter of training and school showing requests of the instructor. Educators are required to have instructive information (PK), subject substance information, educational substance learning (PCK), learning of students, hypothetical information, study hall information, information of setting, make learning, case information, individual down to earth information and curricular learning. These gathering of capabilities, Guerrero notes, fails to impress anyone. He, accordingly, proposed that the educator's learning that is vital for instructing with innovation in the twenty-first century is the academic innovation

information, given that innovation is an irreplaceable impetus for achievement in every human undertaking.

This is concisely communicated in his synopsis of the learning base of instructors as "Academic Technology Knowledge (PTK)". As per Guerrero (2005), there is the requirement for the coordination of all exercises that occur in the school. For example, incorporating innovation learning into both curricular and extra-curricular exercises. Guerrero saw PTK as information that goes past simply knowing innovation, yet how to coordinate innovation into the educating and learning process. He at that point included that instructing ought to be described by five focal parts. These parts, as he referenced, were the general standards of guidance, association and homeroom the executives explicit to the utilization of innovation in the study halls, educators' topic information, comprehension of how innovation can make the topic progressively conceivable for understudies, and substance explicit nature of educational innovation learning. Niess (2005) additionally marked educating with innovation as innovation academic substance learning. As indicated by him, learning a topic with innovation is a certain something, and learning a topic with innovation so you could instruct that topic with the assistance of innovation is an alternate issue out and out. By suggestion, one could be instructed with innovation however it doesn't ensure his capacity to show someone else with innovation, except if he is instructed how to. He, accordingly, contended that it is relevant for forthcoming instructors to be instructed how to utilize innovation to educate. This without a doubt puts a few obligations at the doorstep of instructor teachers. In such manner, Niess characterizes the results of TPCK advancement in an instructor readiness program to incorporate four head parts of PCK. These parts are

1. The Principal idea of the stuff to show a particular topic which permits the reconciliation of innovation in the learning exercises;

2. The Knowledge of instructional methodologies and representations for showing a particular subjects with innovation;

3. The Knowledge for understudies' extravagances, reasoning, and book learning as per innovation in an exact subject.

4. The Knowledge identifying with educational plan and its materials that coordinate innovation with learning in the branch of knowledge (Niess,2005).This implies that the thought proposed by Niess (2005) shares some likeness with the structure proposed by Guerrero (2005).This is on the grounds that the two communicated the requirement for instructors to have an information base that would empower them educate with innovation.

The present conceptualization of TPACK has risen with a progression of productions in the field of instructor training and innovation which spread over a time of five years by researchers (e. g. Koehler et al 2004:2007). These investigations finished with a proposition of the value-based model of compelling innovation mix with substance and instructional method. The most extensive of all investigations on TPACK can be found in Mishra and Koehler's (2006) study which exhibits a point by point depiction of the innovation, instructional method, and substance information, just as the learning rising at the convergences of these information areas. .

In 2007, Thompson and Mishra added the component of setting to the TPACK structure which is depicted as far as evaluation level of the learner, schools or a class in which the technology is utilized. Thompson and Mishra (2008) proposed an adjustment in the abbreviation for simpler elocution and "to shape a coordinated entire, a Total Package"

among the three principal information spaces; in this way, TPCK moved toward becoming TPACK. Here, the possibility of the "All out bundle" demonstrates the between relatedness and between reliance that exists between all the information areas despite setting. Basically, educating and learning would not be viable with the pre-control of a portion of the areas while disregarding others. It is in such manner that Kafylilo (2010) urges instructors to "build up a capacity to adaptably explore the spaces characterized by the three components of substance, teaching method, and innovation and the unpredictable communications among these components in explicit settings". As per Koehler and Mishra (2009), educators need to comprehend what and how they apply innovation in the one of a kind settings inside their homerooms. In this manner, there is the requirement for educators to build up the information required for innovation reconciliation in instructing while tending to the mind boggling, multifaceted and arranged nature of this learning. This demonstrates with the goal for educators to viably incorporate innovation in their instructing (Mishra and Koehler (2006). Mishra and Koehler feature the mind boggling jobs of, and interaction among the three primary segments of a learning domain: substance, teaching method and innovation. In this manner, the TPACK system accentuates teachers' comprehension of advancements just as educational and substance learning for effective instructing with innovation (Koehler and Mishra, 2008). In perspective on this, Harris, Mishra and Koehler (2009) hypothesize that "TPACK underscores the associations among advances, educational program substance, and explicit instructive methodologies, exhibiting how educators' understandings of innovation, instructional method, and substance can collaborate with each other to create successful control based educating with instructive advances". Voogt, Fisser, Pareja, Roblin, Tondeur and van Barack (2013) anyway note that the innovation space in TPACK isn't the means by which the innovation can be coordinated in

instruction, rather, it is viewed as an isolated area that can be actualized in the educating condition.

2.3 Components of the TPACK Framework

This segment deals with the framework and the knowledge domains that strengthens this study and it has been described in detail.

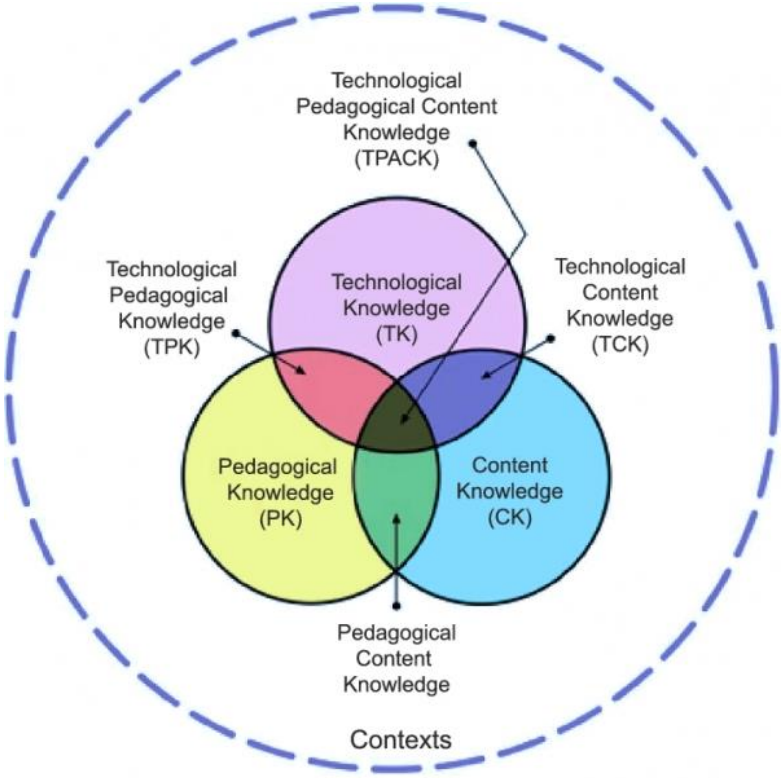


Figure 1: ***Koehler and Mishra (2006) TPACK model***

In the figure above, Technological Pedagogical Content Knowledge is comprised of seven methodologies in particular; Technological Knowledge (TK), Pedagogical Knowledge (PK), Content Knowledge (CK), Technological Content Knowledge (TCK), Pedagogical Content Knowledge (PCK), Technological Pedagogical Knowledge (TPK) and Technological Pedagogical Content Knowledge (TPACK.

2.3.1. Content Knowledge (CK)

Content Knowledge discusses the information identifying with what the instructor is going to teach about the subject space to students (Mishra and Koehler, 2006; Wetzel and et al., 2008-2009; Baran, Chuang and Thompson, 2011) For example, SHS graphic design, SHS sculpture, pre SHS or graduate level educational program (Harris et al, 2007). The Knowledge and nature to test fluctuate altogether among substance regions and it is negatively pertinent that educators acquire this attentive. Shulman (1986) demonstrated that CK involves learning of thoughts, ways of thinking, contemplations, just as perceived practices and techniques to develop such information.

2.3.2. Pedagogical Knowledge (PK)

PK is the knowledge that includes how to teach a knowledge domain to a student, lesson plan, class management and teaching strategies (Wetzel, Foulger & Williams, 2008-2009). This includes principles, goals, facts of educational purposes and others. It has been the basic form of knowledge in which students applies in learning, classroom organization, lesson notes improvement and application. It further contains the learning around methods or systems connected in the classroom; the objective listeners, most importantly, methodologies for evaluating understudy astute. The instructor with top to bottom Pedagogical Knowledge secures how learners utilizes information and get aptitudes in detachable methods, and how they advance methods for the brain and tempers to learning. Instructive information needs an acknowledgment of thinking, cultural and creating speculations of learning and how they identify with students in the classroom (Shulman, 1986). It marks PK "instruments of the exchange" and every instructor is ordered to have it.

2.3.3. Pedagogical Content Knowledge (PCK)

Instructive or pedagogical Content Knowledge (PCK) involves learning about strong resemblances, delineations, tests, explanations and designs that instructor applies through showing topic (Shulman, 1986). What has been utilized in this investigation is like Shulman's (1986) idea of encouraging information identified with precise placated zone. PCK involves information including center business of educating, prospectus, valuation, learning and announcing. It further arrangements with the responsiveness of understudies' former information, other training techniques, content-related misconceptions, duplicate relations and systems among various substance based ideas. Further goes with the tractability from finding different strategies for seeing at the comparative information or troublesome and furthermore thought as indispensable to successful instructing (Shulman, 1986).

Adding to the surveys, PCK talks the technique of knowing the various methods for implying and communicating topic. PCK, subsequently, grants the teacher to accentuation on structure thoughts conceivable on the aptitudes and advantages of students. In sight of this, Shulman (1987 as referred to in Koehler and Mishra, 2006) plots PCK to contain, the frequently granted points in one's subject substance, and the most persuasive similarities, reasonable techniques for delineations of those thoughts, drawings, cases, explanations, and demos. Shulman (1986) limitations that accordingly there is no sole most compelling types of delineation, PCK incorporates learning of guidelines and the planning techniques that are reasonable and proper to the educating of a given substance for some random period (Abbitt, 2011). In dynamic instructing, Harris et al. (2009) maintains that information of preparing and learning, valuation measures, cognizance of understudies' previous certainties and substance related mistaken assumptions are really fundamental. This cognizance of these issues sets up educators' PCK. It really compacts

how to configuration accurate topic or troubles and instruct it effectively to furnish understudies of various aptitudes.

Consequently, the accomplishment of CK is as insufficient as substance free guides (Shulman, 1986). Implying that educators' responsibility for information denied of the abilities in making it justifiable to understudies renders it indispensable in the instructing and adapting course. In locating this, there is a gigantic charge on educators to get the appropriate methods for ensuring that they have commonality of the substance and learning of the teaching method which structures their PCK.

2.3.4. Technological Knowledge (TK)

TK is learning about different Technologies from the most essential exercise materials for the most part improved digital technology (Pamuk, Ülken and Dilek, 2012). For example, books, chalk and writing board, and further developed advances like the web and computerized video (Koehler, Mishra, Hershey and Peruski, 2004; Koehler and Mishra, 2005; Koehler, Mishra &Yahya, 2007; Mishra and Koehler, 2006, 2008). TK includes the learning that is required to work specific advances. These incorporate information of working frameworks and standard arrangements of programming instruments, for example, word processors, spreadsheets, programs and email. Mishra and Koehler likewise added information of how to introduce and evacuate fringe gadgets, introduce and expel programming programs, and make and file records. It is anyway imperative to take note of that, TK isn't static. This surmises instructors would need to familiarize themselves with exceptional arrangements of TK that would enable them to change in accordance with new advances that would rise with time. In such manner, it is basic for teachers preparing projects to be intended to suit the dynamic idea of technology

2.3.5. Technological Pedagogical Knowledge (TPK)

(TPK) is information of the presence, segments, and abilities of different advances as they are utilized in instructing and learning settings, and how educating may change because of utilizing specific advances (Mishra and Koehler, 2006). Graham, Cox and Velasquez (2009) see TPK as the learning of general educational exercises that an instructor can participate in utilizing rising innovations. Once more, Schmidt, Baran, Thompson, Mishra, Koehler and Shin (2009), see TPK as "learning of how different advances can be utilized in instructing and the understanding that utilizing innovation may change the manner in which instructors educate". To Owusu (2014), TPK is learning of utilizing innovation to actualize distinctive instructing strategies. From these definitions, plainly TPK manages how instructors can make their topic information. From these classifications, plainly TPK manages how teachers can make their topic information understandable and available to students using advancements. Accordingly, it understands the scope of instruments exist for a specific task, the capacities to pick a training apparatus dependent on its wellness, procedures for utilizing the showing devices, and information of academic methodologies and the capacity to apply those techniques for utilization of innovations. Once more, it ends up evident that mechanical substance learning is pre-essential for innovative educational information. This is on the grounds that thinking about the presence of innovative helping gadgets is essential, and the craft of realizing how to viably acquaint these gadgets with the proper substance or points and at what specific time in the instructional procedure exemplifies the entire thought communicated here. It ought to be noted, along these lines, that it is likewise a general instructive action that grasps educator make; therefore the entire business of lobbing and being inventive with the goal that a definitive outcome yields powerful substance conveyance to understudies. Understudies experiencing their pre-administration arrangement program ought to in this manner be aware of this respectable

interest of the calling in the 21st century. By suggestion, visual art teachers' instruction projects must open imminent instructors to methods for speaking to and detailing topic with collection of rising digital devises.

2.3.6 Technological Content Knowledge (TCK)

TCK is the learning that empowers visual art teachers to transmit the subject into technological stage by utilizing technological apparatuses (Koehler and Mishra, 2009; Kereluik,Mishra and Koehler, 2011; Pamuk et al., 2012) an opinion which is in consonance with the perspectives communicated before by Mishra and Koehler (2006) that technology content learning is about the way where technology and content are equally related. In other words that innovation compels the portrayal of the topic educated. On the other hand, technology manages the sorts of subject to be instructed. Instructors need to know the topic they instruct as well as the way in which the topic would upgraded by the utilization of technology, and this information must be adaptable enough to allow time and setting alteration. In perspective on this, Clark (2013) proposes that technology content learning must be "adaptable, innovative, and versatile" to empower instructors oversee, direct and utilize innovation in setting explicit ways.

2.3.7 Technological Pedagogical Content Knowledge (TPCK)

Technology Pedagogical Content Knowledge (TPCK) is a type of learning that goes past the three separate segments, for example, technological knowledge, technological content knowledge and pedagogical content knowledge. TPCK is a synergistic develop that consolidates these different learning base for viable educating. Koehler and Mishra (2009) and Owusu (2014) set that TPCK treats technology, knowledge, and teaching method in unionism and mixes the three separate builds (content, technology and

instructional method which is pedagogy) in an unpredictable relationship. The comprehension emerges from the connections and interaction between and among innovation, content, and academic information that structures the premise of important innovation reconciliation in instructing. They contend that TPACK underlies the premise of good training which is educated by technology and requires a comprehension of the portrayal of ideas utilizing advancements. It additionally grasps the arrangement of instructive strategies that utilization useful approaches to show content, information of what makes ideas troublesome or simple to learn and how innovation can help change a portion of the issues it understudies. The TPCK structure proposes that the combination of innovation in instructing and learning requires an astute interlacing of every one of the three wellsprings of visual art teachers knowledge: innovation, teaching method and substance. Subsequently, Mishra and Koehler takes note of that quality instructing requires the comprehension of the perplexing connections between innovation, substance and teaching method, and utilizing this comprehension to create suitable, setting explicit techniques and representations.

2.4 Instrument for measuring TPACK

Taking a gander at the research literature, two primary classifications of instruments can be differentiated: self-assessment surveys, and performance-based assessments with a focus on lesson planning, teachers' classroom performance, and performance on specific tasks. An outstanding instrument to quantify instructors' self-view of their TPACK is the TPACK Survey, created by Denise Schmidt and partners, in which planned tutors and rehearsing instructors report their impression of trust in TPACK on a 5-point Likert scale

with things that mirror every one of the seven spaces of the TPACK structure. For instance, things in the TPACK Survey that can be utilized with regards to visual art are “I keep up with important new technologies” (TK), “I can adapt my teaching style to different learners” (PK), “I have sufficient knowledge about visual art subject” (CK), “I can select effective teaching approaches to guide student thinking and learning in mathematics” (PCK), “I know about technologies that I can use for understanding and doing mathematics” (TCK), “I can choose technologies that enhance students’ learning for a lesson” (TPK), and “I can teach lessons that appropriately combine art, technologies, and teaching approaches” (TPCK). Numerous researchers have embraced the TPACK Survey in light of the fact that most study show solid results when this study is utilized. By adjusting the study, one can center, for example, on a particular innovation or teaching method, or on the T-related learning spaces as it were. There has been some talk about whether it is conceivable to gauge the seven particular learning spaces from the TPACK structure with a self-appraisal review. A few investigations report a generally excellent generation of the learning areas with factor examination, while different examinations show that the information spaces of the TPACK system couldn't be repeated. To outline, some ongoing examinations by the creators of this section demonstrate that a factor investigation demonstrates a high association between the T-related areas TK, TPK, TCK, and TPCK. This may propose that the coordination of the learning spaces goes past the three fundamental information spaces and the covering territories. The second classification of instruments to evaluate TPACK is more execution based. A case of such an exhibition based evaluation is exercise arranging appraisal. This kind of instrument is normally utilized for preservice educators who need to get ready innovation improved exercises. As a rule, their exercise plan reports are surveyed on TPK, TCK, and TPACK, and on "fit." The exercise plan appraisal instrument that was created by Judi Harris, Neal

Grandgenett, and Mark Hofer, for example, measures this fit by inquiring as to whether the substance, the proposed instructional methodologies, and chose innovation fit together inside the general instructional arrangement. The vast majority of these instruments are as a rubric: The criteria TPK, TCK, TPCK, and fit can be scored on a 3-to 5-point scale. Beside exercise plan archives, these rubrics are likewise used to survey other instructors' arranging curios, (for example, learning materials) as a major aspect of their arranged guidance. A few examinations use execution based appraisal instruments to gauge errands and study hall practice. Instances of assignments that can be evaluated are configuration undertakings (structure an innovation improved exercise for a particular point and a particular educational methodology), understanding errands (clarify the idea of TPACK), and talks (examine the idea of TPACK in a gathering, examine how you will show innovation coordination in your exercise). Classroom practice can be evaluated by seeing how and to what degree the educator is incorporating technology in his or her exercises. The assignments and study hall practices are surveyed by recognizing key segments and setting criteria and scoring these criteria dependent on the job needing to be done. Key parts for the most part are the subjects tended to, the instructional methodologies and learning exercises that are utilized, and the innovations that are utilized by the educator. Like the exercise arranging appraisal, the majority of these instruments are as a rubric with criteria identified with TPK, TCK, TPCK, and the "fit" that can be scored on a 3-to 5-point scale.

2.4.1 Measuring Visual art teachers TPACK

The inquiry remains whether the self-assessment surveys, lesson-planning assessments, and performance-based assessments are adequate to gauge visual art instructor's technology combination abilities. From concentrates that are identified with technology blend in instruction, we realize that information and abilities are significant variables and

that art instructors' frame of mind toward technology and their academic convictions assume a noteworthy job in the accomplishment of technology integration. For example, art teachers can have what is called adopted- TPACK, which suggests that art instructors can discuss academically solid technology integration in a particular point, however that does not really imply that this will prompt what is brought being used TPACK. Art teachers have being used TPACK when they can make an interpretation of their thoughts into the structure and usage of an academically solid technology improved exercise for their content inside a particular setting. This requires a blend of learning, aptitudes, and frames of mind, and the capacity to reason expertly. This suggests an expert improvement program ought to take care of this, yet additionally that learning and aptitudes as well as convictions, frames of mind, and the capacity to reason expertly ought to be viewed as when estimating instructors' innovation reconciliation exercises. A self-evaluation overview could accordingly be expounded with scales from other existing instruments to gauge instructors' frames of mind toward (instructive) innovation and their academic convictions. Essentially, rubrics and different evaluations structures could be extended with classes that are identified with convictions and demeanors, but since these are regularly hard to watch, these could be supplanted by the perception of expert thinking. Instances of this are just accessible hardly right now

2.5 The Relevance of the TPACK framework to the Study

Instructive policymakers share the assessment that technology is the response to numerous issues related with quality in training (LeCompte, 2004). In perspective on this, schools are getting innovative instruments to help the educating and learning process. In this manner, visual workmanship instructors must be prepared to procure the pre-imperatives for incorporating technology apparatuses in classroom guidance.

Truth be told, visual art instructors must build up a working information of programming applications and manners by which they can arrange their utilization for viable learning. The usage of this venture must happen on two fronts. To begin with, the visual art instructors of tomorrow should figure out how to utilize the devices themselves, and furthermore, the devices must be connected by and by. Once more, as innovation turns out to be increasingly universal in the public arena, there is a suggested weight that the utilization of technology should likewise end up pervasive and straightforward inside the instructing and learning process (Ritter, 2012). Along these lines, as access to technology and its consequent content spaces become progressively predominant, its application inside the educational program and instructive utility turns out to be progressively critical to teachers. Moreover, the ramifications of how technology is used in building exercise plans, and how academic and curricular choices are made, turned out to be progressively convincing. This has prompted the advancement of the TPACK structure to control visual art instructors build up the information of coordinating technology, instructional method and substance in the educating and learning process.

The TPACK system, in this way, gives an intelligent structure that enables teachers to more readily comprehend sound technology blending. Sound innovation joining influences how teachers settle on successful choices with respect to scholastic substance and academic strategies (Ritter, 2012).The improvement of this sound information requires the comprehension of the TPACK structure. The TPACK structure demonstrates unmistakably how technology is incorporated with the fundamental learning base for compelling educating in the 21st century. A comprehension of visual art teachers to incorporate technology in their instructing is significant if any imprint is to be made in this 21st century. The TPACK system epitomizes the fundamental information spaces of instructing with sharp accentuation on innovation coordination into the academic

arranging and exercises that go before teaching and during educating. To a bigger degree, the TPACK structure sets a benchmark for gathering the status of an effective instructor in the 21st century. In this way, evaluating the nearness or generally the Technological Knowledge (TK), the Technological Pedagogical Knowledge (TPK) the Technological Content Knowledge (TCK), the Technological Pedagogical Content Knowledge (TPACK) mastery in visual art teachers in Ashanti region is all around set, as this would make the road for the estimation of the degree to which these visual art teachers are set up to teach with Benefits of Technology in Teaching and Learning Education has adopted a dynamic strategy in the 21st century. The time of innovation has come to remain and educating is relied upon to be encouraged by the utilization of innovation. This is upheld by UNESCO (2002) that instructive frameworks are looked with expanding strain to utilize new advancements to show understudies the learning and abilities they need in the 21st century.

Instructors should be arranged and prepared to incorporate technology in their teaching so as to completely fit into this new time of educating and learning encouraged by innovation. Instructors can coordinate technology in their teaching through a constructivist outlook. The constructivist view urges instructors to utilize innovation to "extend homeroom limits, interface understudies to genuine occasions, and guide understudies to end up free students" (Teo, 2009, p. 7) through dynamic and intellectual learning. Watson (2007) shows that the coordination of innovation into the study halls is necessary to giving the training expected to the achievement of contemporary students (Watson, 2007), and that is the successful method for adjusting the instructive procedure of the manner in which educators think. Technology prepared classroom upgrade the teaching and learning process by moving the way to deal with classroom guidance from

conventional strategies to an increasingly helpful technique for training which apparently improve students learning (Matzen & Edmunds, 2007).

A few researchers have demonstrated significant jobs technology play in this new time of instructing. Al-Alwani (as refered to in Savas, 2011) shows that the fundamental advantage of innovation in instruction is that it makes students free learners who modify their pace of getting the hang of as indicated by their own pace by utilizing Information and Communication Technologies (ICTs). This implies the utilization of technology in instruction guarantees that students are capable and dependent all alone capacity dissimilar to the conventional classrooms where students effectiveness is subject to the abilities of the teacher and the pace of the classroom cooperation. This likewise surmises students decide the pace of the learning procedure as indicated by their own pace by utilizing data and communication technology. Matray and Proulx (1995) posit that technology makes learners more active and engage in lessons and stimulates teamwork.

Students participation in the instructional process is heightened when the lesson is influenced by technology as most of the children play around with most of these technologies. Becta (2002) discuss the benefits technology have in education as larger incentive, improved self-worth and self-assurance, improved interrogative skills, encouraging creativity and self-determining knowledge, enlightening demonstration, emerging problematic solving abilities, encouraging improved evidence management skills, growing 'time on task', refining social and communication aids. Roschelle, Abrahamson, and Penuel (2004) postulate the use of technology in the instruction and learning procedure can provide backing for student education in four major scopes: "dynamic engagement, cooperative learning, real-life backgrounds in recurrent and instant feedback. Technology also assists the student learning by encouraging "high-order thoughtful and metacognitive aids that are vital to eloquent learning" (Wang, Kinzie,

McGuire, & Pan, 2010, p. 382). Wang et al. continue that technology can encourage book learning by emerging awareness and incentive, providing right to use to information, and upkeep the learning course strategically and advantageously. Brandstrom (2011) commented about the use of the internet in education by indicating that it facilitates learning, teaching and communication.

Innovative storytelling podiums and wikis are progressively being used in the teaching and learning process to motivate and encourage students by taking into consideration their abilities. The use of these tools allows students to develop and foster their self-efficacy through constructivist, student oriented practices (Adcock &Bolick, 2011). These also allow learners and tutors to co-construct facts and meaning, which encourage constructivism in the schoolroom. The instructive tools allow tutors to be seen as teaching space persuaders and material intermediaries (Schneiter, 2010).The usage of these educational technologies, in totaling, allow teachers to present evidence in more than one set-up because the multimodal structure of data and ideas upsurges the chance that more learners will study and preserve information in the classroom (DeGennaro, 2010).

In support of this, Schneiter (2010) elaborates that in teaching and learning, the use of various educational technologies can help students to understand, visualize, and engage with certain dynamic concepts. Beyond the classrooms, Morris (2012) indicates that teachers use technology for planning, grading, data management, sharing and organizing resources, communicating with colleague teachers and parents, and video conferencing. Morris further asserts that in the classroom, teachers use technology for multimedia presentations, classroom demonstrations and explorations, class web pages and blogs, images and movie clips, concept mapping, digital storytelling, movie making, and the facilitation of group work and homework assignments. In all these instances, teachers use personal computers, interactive white boards, LCD projectors, presentation software, the

Internet, various Web 2.0 applications, wikis, digital flex books, graphing calculators, spreadsheets and word processors, cell phones and other mobile devices, educational software, mobile data collection units, iPods and iPads, and digital/video cameras (Thieman, 2008; Hammond, Fragkouli, Suandi, Crosson, Ingram, Johnston-Wilder, Johnston-Wilder, Kingston, Pope & Wray, 2009; Schneiter, 2010; Steinweg, Williams & Stapleton, 2010; Adcock &Bolick, 2011).

Commenting on the role of technology to the teacher, Savas (2011) indicates that tutors earnings from Information and Communication Technologies to retain high and unify students' information and permit the instructors to get extra period for instructional doings. In using technology in education also enhances the teaching and learning process as teachers are able to communicate with students anytime from anywhere. Thus, in using educational technologies, teaching and learning is not limited to the classroom as has always been in the traditional classrooms. The use of technologies also ensures that teachers are more creative and are able to present instructional materials that are more interesting by the use of the properties of information communication technologies (Matray&Proulx, 1995). This means that teaching and learning becomes meaningful and interesting when they are supported by technologies. Given the enormous role that technology play in teaching and learning in this digital world, it is very essential that student-teachers teach with the emerging technologies when they finally assume the mandate to teach as professional teachers. It is, therefore, very important to find out if visual art teachers integrate technology in teaching in order to proffer the necessary support or recommendations.

2.6 Barriers that affect technology Integration

Ertmer (1999) provides a way of conceptualizing the different factors that influence technology integration, distinguishing between first-order (external) barriers and second order (internal) barriers. First-order barriers refer to obstacles extrinsic to teachers, for example apparatus, period, preparation, and upkeep (Ertmer, 1999). Second-order barriers include those that interfere with or impede mental change, including teachers' confidence, convictions about how students learn and the apparent estimation of innovation to the instructing and learning process (Ertmer, 1999; Ertmer et al., 2012). Studies looking at the progression of teachers' integration and use of technology from 1991 to 2004 revealed that while in 1991 a few teachers effectively incorporate technology because of key issues, for example, absence of openness and specialized help, "most of instructors in 2004 seemed to have accomplished essential degrees of computer integration into their everyday proficient exercises" (Shi & Bichelmeyer, 2007, p. 188). This can partially be explained by the increase in access to resources in the early 2000s, reducing first-order barriers (Ertmer et al., 2012). Despite this apparent progress however, the literature still points to certain factors, such as resources and institutional structure, as problematic for technology integration. The following provides an overview of first-and second-order barriers, followed by a consideration of their relative importance.

2.6.1 First-Order Barriers

Many factors have been documented to influence teachers' integration of technology into the classroom. In an analysis of 48 empirical studies conducted from 1995 to 2006, Hew and Brush (2007) documented technology integration barriers and divided them into six different categories namely (1) resources, (2) institution, (3) subject culture, (4) assessment (5) teachers attitudes and beliefs, and (6) knowledge and skills. Amongst these six categories, the first four fall under first-order barriers (Ertmer et al., 2012).). Critically, the absence of access to technology does not just allude to innovation

accessibility of innovation, yet additionally to the quantity of advancements, the kinds of advances and the area of advances (Hew & Brush, 2007). Importantly, the lack of access to technology does not merely refer to technology availability of technology, but also to the number of technologies, the types of technologies and the location of technologies (Zhao, Pugh, Sheldon & Byers, 2002; Hew & Brush, 2007). For example, when computers are located in classrooms and are Internet-connected, teachers are more successful in carrying-out innovative and technology-rich projects (Zhao et al., 2002). In addition, lack of on-site support for teachers using technology, lack of help supervising children when using computers, lack of ICT specialist teachers, and lack of financial support have also been documented as problematic to technology integration (Mumtaz, 2000). Time is also an important constraint to technology integration (Mumtaz, 2000). Lack of time can be understood in the context of the large amount of preparation needed for using unfamiliar technologies (Zhao et al., 2002). In a related vein, the pressure of testing can be a major barrier to technology integration, as teachers can feel that they have limited time to try new instructional methods involving technology (Fox & Henri, 2005; Hew & Brush, 2007). Lack of school leadership, inflexible school time-tabling structure and the lack of school planning with regard to technology use are all institutional factors that can impede teachers' integration of technology (Hew & Brush, 2007; Fox & Henri, 2005; Becker, 2000; Lawson & Comber, 1999). Finally, subject culture, which refers to the institutionalized practices and expectations that exist surrounding a school subject can become a barrier for technology integration when teachers are hesitant to adopt a technology that is not perceived as compatible with the norms and practices of their subject (Goodson & Mangan, 1995; Henessy, Ruthven & Brindley, 2005; Hew & Brush, 2007). For example Henessy et al., (2005) found that many English teachers perceived ICT to be incongruent with their subject culture.

2.6.2 Second-Order Barriers

One of the most common reasons teachers give for not using technology is a lack of knowledge and skills (Hew & Brush, 2007). Becker (2000) surveyed over 4,100 teachers in order to understand the relationship between teachers' educational philosophies and characteristic teaching practices, how they used computers in their teaching, and different aspects of their teaching environments. Results showed that teachers' technical expertise influenced the level of integration of technology into their teaching practices (Becker, 2000). Similarly, in a study investigating the use of ICT by academic and non-academic staff, O'Mahony (2003) found that the provision of relevant and supportive training for staff was a major obstacle. It is also important that teachers possess technology supported-pedagogy knowledge (Hew & Brush, 2007). This is knowledge about the different ways that technology can be used for teaching, which can be divided into three categories: (a) replacement, (b) amplification, or (c) transformation (Hughes, 2005). As described by Hughes (2005), technology as replacement means that technology is not changing instructional practices, but merely replacing other forms of instruction. In technology as amplification, technology is used merely to make instruction more efficient and effective (Hughes, 2005). Finally, when technology is used as transformative, it can change how learning occurs, including cognitive processes and problem solving (Hughes, 2005; Pea, 1985). Hughes (2005) found that when teachers' learning experiences and knowledge was focused uniquely on technology with no connections to education or their content areas, they used less innovative technology-supported pedagogy. Teacher attitudes and beliefs surrounding technology can present another major obstacle to technology integration (Hew & Brush, 2007). An attitude is "a readiness to become motivated with respect to an object", for example how much a teacher likes or dislikes technology (Sartain, North, Strange, Chapman & Martin, 1958, p. 1). A belief is "an acceptance or rejection of a

proposition about reality" and in the context of technology integration, it can be understood as educational beliefs about teaching and learning as well as beliefs about technology (Sartain et al., 1958, p. 1). Beliefs generally are found to determine attitudes (Onur Bodur, Brinberg, & Coupey, 2000; Hew & Brush, 2007). It has been argued that ultimately, the decision about whether and how to use technology is dependent on teachers' beliefs surrounding technology (Ertmer, 2005). Similarly, Becker (2000) found that teachers' pedagogical philosophies could influence a teacher's level of technology integration into their teaching practice. Further support for the association between what a teacher believes and her/his technology use is provided by Inan and Lowther's (2010) research-based path model for causal relationships between factors affecting individual characteristics of teachers and perceptions of environmental factors that influence their technology integration in the classroom. Furthermore, teachers with constructivist beliefs tend to use technology to support student-centered curricula, while those with traditional beliefs use computers to support more teacher-directed curricula (Tondeur, Hermans, Braak, & Valcke, 2008).

Weighing the Relative Influence of First- and Second-Order Barriers As found by Hew and Brush (2007), the three most frequently cited barriers that impact technology integration are resources, followed by teachers' knowledge and skills and teachers' attitudes and beliefs (Hew & Brush, 2007). Considering the evidence reviewed above, it is apparent that resources remain an important challenge, despite the increased availability of technology in schools. Ertmer et al., (2012) conducted multiple case studies to assess whether external constraints exert the same influence over teachers' technology practices as was the case 10 years ago, as well as to determine the extent to which first-order barriers constrain teachers' efforts to integrate technology, leading to possible misalignments between beliefs and practices. The authors found that teacher beliefs

surrounding technology differed, however, on average, each teacher's belief was linked to their practice (Ertmer et al., 2012). For example, those teachers who believed that technology was useful to deliver content or reinforce skills, used technology in their practice to keep students busy interacting with the content through the use of math stations (Ertmer et al., 2012). Importantly, this link between teachers' beliefs and teaching practices was observed despite technological, administrative or assessment barriers (Ertmer et al., 2012). Thus, while technological, administrative or assessment barriers remain important, teachers' beliefs surrounding technology are highly associated with teaching practices. This is consistent with Pelgrum's (2001) findings from a multi country study showing that both material and non-material conditions figure among the top 10 obstacles to ICT integration in education.

2.7 Teachers' competencies in integrating technology

Competence is normally characterized as being able to play out a particular errand (Agyei 2012) Research into computer skills additionally demonstrated with the terms computer execution, computer capacity, or computer accomplishment, is as opposed to the huge consideration of concentrates in computer frames of mind (Melissen 2008). Instructors capabilities in computer use is normally estimated through self-report. One may contend that hence instructors' capabilities ought to be considered as self – viability estimates which characterized as "trust in one's skill" (Bandura, 1997).

Various investigations have demonstrated that computer abilities are emphatically associated with a person's readiness to pick and take an interest in computer related exercises , desires for accomplishment in such exercises and steadiness or compelling adapting conduct when looked with computer challenges (Looney, Valacich and Akbulut, 2004 ; Sang, Valcke, Van Braak and Tondeur, 2010; Smarkola, 2008). Instructors with

higher technology abilities utilized computers frequently and experienced less computer related tension. Then again, tutors with lower levels of technology abilities become progressively disappointed and increasingly restless and delay, to utilize computer when they experience deterrents (Sang et al, 2010) More late investigations about instructors technology capabilities separate between fundamental technolgy skills and academic technology skills (Law et al, 2008). Additionally Smarkoa (2008) contended that for successful reconciliation of technolgy, instructors must move past being "computer proficient" to "technology able". Smarola included that being mechanically equipped enables tutors to utilize computer as a major aspect of the educational plan and as a device for bona fide student commitment and learning. Research demonstrates that computer able impact desires and enthusiastic apportions with respect to the successful utilization of current advancements (Looney et al, 2004).

In Turkey, Ekrem and Recep (2014) inspected pre-administration English as a Foreign Language (EFL) instructors' TPACK capabilities. The motivation behind the investigation was to comprehend the TPACK competency of pre-administration English educators. The examination found that the pre-administration English instructors can establish positive learning environment in the language study room by utilizing technology while their innovation information isn't at the ideal level particularly when they experience any specialized disappointment. One of the pith of value educating and learning is to give quality instructing condition that advances viable student learning. In reality, on the off chance that innovation guarantees this compelling quality showing result, at that point it is a vital requirement for instructive foundations to prepare educators to have such information in innovation to adequately utilize them in the study room. Owusu (2014) likewise settled that the teachers he examined were in a superior position to utilize technology to adequately improve their instructive practices to draw in learners

in the instructing and learning experience. The study explicitly demonstrated that, teachers can pick technology that improve the showing approaches for one or two and students learning of an idea. What's more, teachers can pick advances that are proper for their instructing and apply advances to various showing exercises, successfully deal with an technology classroom, use technology to help survey students learning just as use technology to effectively draw in understudies in the instructing and learning process. On the off chance that instructors have the right stuff of utilizing innovation in improving their academic exercises, at that point it is exceptionally important that understudy educators are given these abilities during their preparation.

In Turkey, Tinmaz (2004) surveyed instructors' technology in connection to their branch of knowledge. The investigation demonstrated that that instructors were graduated with a not exactly direct degree of competency in instructing with technology. It could be seen that while Owusu (2014) research instructors and found that they had academic information, Tinmaz researched instructors and had an opposite discoveries. There is by all accounts no clearness regarding whether instructors have technology content information.

2.8 Empirical Review

This section of the chapter focuses on related studies that have been piloted on the topic. This is particularly important in the study as it would provide the basis for assessment. The theoretical review is planned in agreement with the study questions framed to guide the investigation. Technology ought to be a fundamental piece of tutors planning programs. Research demonstrates that instructors will in general show how they were taught (Ball, 1990; Lortie, 1975). Consequently, on the off chance that we anticipate that

tutors should instruct in a constructivist way utilizing technology, we should encourage them in constructivist ways utilizing innovation. In a seminar on instructive innovation for instructors, the objective ought not just be to show the utilization of a few innovation frameworks, their focal points and burdens; rather, the objective ought to be to furnish understudies with chances to think like specialists in settling on instructional choices, choosing media for fitting use, organizing learning exercises and utilizing sound educational techniques, all things considered, settings. The tutor in an instructor arrangement course should structure the learning condition with the goal that he/she will have the chance to demonstrate master conduct to students in sound employments of technological based instructing and learning. It is significant that the teacher is a specialist in technology based learning in light of the fact that at exactly that point he/she can demonstrate to the students – future educators – master conduct. Besides, instructor arrangement projects ought not just offer a course in instructive innovation, yet in addition show viable utilization of technology in showing teachers a few different courses. Constructivist employments of technology in instructing ought to be demonstrated in the instructing of other topics, for example, arithmetic training, science instruction and social studies. For instance, during a course in science instruction, future instructors ought to be instructed with innovation in manners that model suitable innovation based learning for science training. There are various methods for coordinating innovation in educator training since innovation can give a rich setting to learning. Innovation rich situations enable forthcoming educators to encounter genuine situations of homeroom instructing, develop various viewpoints and ponder their training. A few rich intelligent media frameworks exist in the market that enable understudies to work in gatherings to audit video vignettes of study hall educating, distinguish great practices and talk about them with their friends. At Arizona State University, the educator arrangement programs for

both in-administration and pre-administration instructor preparing on arithmetic strategies utilize an intuitive media program called Mathedology (Technology Based Learning and Research, 1998). This expert improvement program mixes instructive systems and ideas with best in class introduction and conveyance components. Its principle reason for existing is to improve the numerical talk capacities of essential tutors.

From the findings of Tyger's (2011) study, teachers' technological knowledge is not at a high level to ensure that they enhance their teaching with technologies which presupposes that most teachers may struggle to cope with the technological anxieties of 21st century classrooms. Teachers can only be aligned to technological trend if they are made to know the various technologies that could enforce teaching. This would go a long way to help them to integrate technology in teaching. As such, if technological knowledge is developed, the teachers would develop technological schema that would help them to learn emerging technologies. This would help to develop their confidence in the use of technology as indicated by the researcher that the knowledge of technology was directly related to teachers' confidence. Such confidence would be necessary in integrating technology in teaching.

Smith (2012) conducted a study on teachers' views of their in-service education programme in USA. The research focused on how teachers' were influenced and changed by a in-service education programme with technological focus and how that experience extended into their subsequent teaching practice. On technological knowledge, the study establish that instructors are used to a lot of technologies through their programme, comprising: Smart boards, science probes, and clickers; PowerPoint presentations, digital portfolios, photo stories, learning objects and websites. Their programmes also prepared them on accessing resources on the internet, connecting the projector to the computer, and organizing data into files. Interestingly, unlike Tyger (2011) who specified that

instructors are not prepared to use ICT, Smith found otherwise. Smith discovered that teachers were adequately prepared by their teacher education programmes to use technology. Hence, it is likely that such teachers would appreciate the use of ICT than the teachers in the study of Tyger. When teachers are to be ready to fully integrate technology, then such technologies should be incorporated in their courses of study as indicated by Smith. Such exposure to innovative tools is likely to provide them with basic knowledge that would help them in appreciating and adopting technologies in the classroom. Easter's (2012) study corroborated the position of Smith's (2012) study. Esther's study focused on tutors and technology literacy in USA. The study revealed that the tutors training programme provided in-service teachers with the knowledge of technology integration during their preparation programme through the use of ICT tools. A look at Esther's study indicates that in-service teachers may be technologically proficient to teach with technology since they have been exposed to such training. Esther's study could have been further enriched if the views of in-service teachers were also considered in addition to the faculty members. This would have highlighted how such technology modelled instruction actually influenced students' proficiency in technology. It is, however, interesting to find that at the university level, efforts are made to educate students on the use of technology.

The acquisition of technological knowledge is not solely dependent on the colleges of education as studies have indicated that the roles of other stakeholders before schooling can also influence teachers' use of technology. Yoon (2012) confirmed this from his study at USA that teachers learn more about technologies even before they opt for teaching. This means that students are exposed to the use of technologies before they enter their teacher training institutions. Elsewhere, Juarez (2014) indicates that parents in their own capacity had influenced their children with the use of technology in learning but such approach is quite limited and narrow. It could be argued from this point that if such an

exposure is further built upon in teacher training institutions, teachers would have sharpened their competencies in the use of such technologies in teaching. In addition, Yoon's study established that teachers had limited exposure to content-specific technologies, except educational websites during their training. If educational institutions put in technology specific content courses to address teachers' technological needs, it would go a long way in fully preparing students in integrating technology in their teaching. In addition to the findings of Yoon (2012), Clark (2013) shows that not only do teachers develop technological skills before entering teacher training programmes but also develop it when engage in field experience. Clark established from his studying USA that teacher education programmes did not make student-teachers effective in teaching with technology. This is because when technology was used by college professors in training student-teachers, it was mainly for assignments

Spazak (2013) made a study on senior high school tutors' perception of their preparedness to incorporate technology in their teaching. The research found out that the tutors were prepared to effectively integrate technology and that the teacher education institutions are also taking an active role in preparing tutors better to incorporate technology into the classroom. It is not shocking that teachers in these established countries are fit and organized to incorporate technology in their instruction. This is because, these developed countries, particularly, USA are well-resourced technologically (Hoekman,Maskus, &Saggi, 2004). Teachers seem to be well prepared when found in institutions that are well resourced with technological tools. This shows that such exposure to technology helps them to developed their knowledge and competency in the use of such technological tools. In a similar study in Malaysia, Raman (2014) measured the confidence and competency level of teachers with the use of technology in their daily practice. The study established that the teachers had skills in using basic ICT applications needed to equip

them to use Microsoft applications such as word processing, presentation, email, web browser, web search, web 2.0 and social network compared to using desktop publishing software, database, multimedia development and other advance applications. Such skills can be used to develop interesting and catchy teaching and learning materials for teaching. It is believed that most often students do not enjoy the way teaching is done in the traditional classroom which uses traditional technologies such as chalk and others (Joshi, 2012). One would wonder if visual-teachers in Ghana are really prepared in the same way to use these technologies to enhance their teaching experiences. Owusu (2014) evaluated New Zealand senior high school science instructors' technological pedagogical content knowledge. The study demonstrated that there was a more noteworthy utilization of ICT with respect to the readiness of exercises by instructors when contrasted with how they utilized ICT for other educating exercises. Dominant part of the educators utilized ICT to scan for data for their exercises and for instructional conveyance. The examination likewise uncovered that most instructors were utilizing ICT devices to assist their understudies with viewing pictures and articles which encouraged the comprehension of the ideas they were instructing. Likewise, the investigation uncovered that the instructors were sure and agreeable when it came to introducing another computer program on their computer while a portion of the educators demonstrated that they had not had adequate chances to work with a scope of advances and don't have a clue how to take care of their own specialized issues just as stay aware of new advances.

CHAPTER THREE

METHODOLOGY

3.0 Overview

This section ponders the methodology that was adopted for the research. It involves the research method and design, population, sample and sampling procedure, data collection instrument, data collection procedure and data analysis.

3.1 Research Design

Mixed method (Qualitative and Quantitative) research method was employed. Case study under qualitative method was used to examine the nature of relations, actions, technological content and circumstances of Visual Art Teachers in the selected Senior High Schools difficult to build up a significant comprehension of human experience without considering the exchange of qualities and convictions. **Lincoln and Guba (1985**) contend that human request requires visit, proceeding and careful connection among inquirers and their respondents and that request must expand as opposed to limit this sort of contact. (weijer C. et al 1999) additionally contend that Qualitative research is a kind of logical research and it comprises of an investigation that: looks for answers to an inquiry efficiently utilizes a predefined set of techniques to address the inquiry, gathers proof, produces discoveries that were not decided ahead of time, produces discoveries that are material past the prompt limits of the investigation.

Descriptive survey under quantitative method empowered the researcher to depict, watch and archive parts of a circumstance as it normally happens as opposed to clarifying it. Along these lines, by utilizing this plan the researcher wanted to learn important or helpful

analysis of the circumstance since it includes describing, recording, examining and translating conditions that exist.

Qualitative research portion were moreover used to comprehend the problematic or subject which investigated the TPACK of Visual Art teachers in some selected senior high schools in Kumasi Metro from the angles of the local populace it includes.

3.2 Population for the Study

Population here is well-defined as the cluster of instructors or objects that the outcomes of this research work are remarkably pertinent to (Fraenkel and Wallen, 2003) such as Visual art teachers in the selected Senior High Schools in Kumasi Metro.

3.2.1 Target Population

The Target population was captured among visual art teachers at four selected senior high schools in Kumasi metro. And these schools were:

i. Asanteman Senior High School, Suame
ii. Adventist Senior High School, Bantama
iii. Kumasi Senior High Technical School, Patasi
iv. KNUST Senior High School, KNUST

Among the 21 Public senior high schools in Kumasi Metro, 17 of the public Senior High schools offer Visual art (GES 2019). The researcher focused on the four schools due to time limitations and fluency with the schools.

3.2.2 Accessible Population

The accessible population for the study was 35 visual art teachers from 4 selected public senior high schools in Kumasi Metro and since it was not likely to encompass the study to cover all the schools in the Kumasi Metro.

Table 1 show the population distribution of Visual art teachers in the selected Senior High Schools in Kumasi Metro.

Table 1: Population distribution of Visual Art Teachers

SCHOOL	N	MALES	FEMALES
Asanteman Senior High School, Kumasi	**7**	**5**	**2**
Kumasi Senior High Tech. Sch. Patasi	**15**	**10**	**5**
KNUST Senior High School, Boadi	**6**	**5**	**1**
Adventist Senior High School, Bantama	**7**	**5**	**2**
TOTAL	**35**	**25**	**10**

Population = N

The 35 constitutes the total number of all Visual Art teachers in these selected senior high schools. Essel 2013 said if the population or the sample size is less than 100, the researcher should use all the sample size. This is the reason why the researcher used all the 35 Visual Art teachers.

3.3 Sampling and Sampling Size

The respondents were 30 participants out of 35 visual art teacher at the four senior high schools. Both purposive and convenience sampling was utilized to enlist participants. As the sample size comprised 35 participants, purposive sampling was significant so as to select respondents' who were probably going to give valuable information to the research question (Green and Thorogood, 2009). Also, so as to mirror the encounters of Visual Art teachers in distinctive subject divisions, (i.e. Graphic design, sculpture, general knowledge in art, picture making etc.), 30 public senior high Visual Art teachers were chosen. Convenience sampling was in this manner used to supplement the purposive

sampling (Green and Thorogood, 2009). In light of my perceptions during this research, I accept that these research participant incorporated their maximum best in the findings.

3.4 Data Collection Instrument

TPACK Questionnaire was the instrument applied to discover the readiness of the TPACK of visual art teachers in the four selected Senior High Schools in Kumasi Metro. The questionnaire was adopted from Chai, Koh and Tsai (2010), Chai, Ng, Li,Hong and Koh (2013), Nordin, (2014), (Refer to the Appendix for the questionnaire).

Furthermore, Crippen (2009), Graham, Burgoyne, Clair and Harris (2009). The choice to utilize this instrument was a direct result of its dependability and legitimacy. The instrument was adjusted in light of the fact that Punch (as referred to in Owusu, 2014) proposed that for a mind boggling and multidimensional variable, it is suitable to utilize a current instrument in the event that one exists. As to inner textures, this survey had a dependability coefficient of 0.6 or more for the different builds of the TPACK structure. Be that as it may, a few things were altered to suit the focal point of the exploration while others were utilized as found in the first records of the initiators.

The pieces found in the questionnaire were organized on a Six theme Likert-type scale that stretched from “Strongly agree (SA) = 5, “Agree” (A) = 4, “Uncertain” (U) = 3, “Disagree” (D) = 2 to “Strongly Disagree” (SD) = 1. The procedure of the five point Likert-scale was knowledgeable by the proposal of McKelvie (as cited in Owusu, 2014) that the five-category scale is extra dependable as equated to the extra scales. Also, utmost of TPACK studies particularly those that aided as a model for this research used a five-point Likert scale. The questionnaire was alienated into six segments in respect to the research questions that steered the study. Segment A concentrated on the demographic features of the respondents. Segment B, dealt with the TK of the visual art teachers.

Segment C also considered the TCK of the teachers. Segment D also covered Technological Pedagogical Knowledge of the visual art teachers. Segment E concentrated on the barriers of the respondents.

3.4.1 Test for Rationality and consistency of Instrument

The initiators Graham, Burgoyne, Cantrell, Smith, Clair and Harris (2009);Chai, Koh and Tsai(2010); Schmidt, Baran, Thompson, Mishra, Koehler and Shin(2010); Chai, Ng, Li, Hong andKoh(2013); Nordin(2014) whose overview things were adjusted for this investigation, directed distinctive validity tests on their instruments. In any case, the researcher thought that it was fitting to guarantee that the instrument for the investigation was valid and solid in light of the fact that the adjusted instruments were utilized in Singapore, Asia, and USA. Things that were not clear in significance were erased. Things that the supervisor thought were essential however were excluded were included to the instrument. The 30 visual art teachers were chosen since they established 10% of the sample anticipated for the bigger parent study. Agreeing to Connelly (2008), surviving writing proposes that a pilot study test ought to be 10% of the example anticipated for the bigger parent study. The fundamental reason of the pre-test was to approve the suitability of the things. The reactions from these visual art teachers were utilized to decide the unwavering quality of the instrument.

3.5 Data Gathering Process

So as to accomplish the set goals of this research, both primary and secondary information were looked for. The primary information were assembled through questionnaire administration, observation, while secondary information comprising of the survey of related writing on instructing of Visual Arts were assembled from the different libraries and the internet. Selected respondents were taken through an in-depth preparation on the

study and how to complete the study. The questionnaire was formulated using Google forms to be easily access by teachers but due to network interferences, the questionnaires were later on converted to hardcopy in a printout format to be distributed to the 30 out of the 35 visual art teacher in the selected senior high schools. This was trying to look for educated assent. They were likewise educated about their entitlement to pull back from the study at their very own volition. Following this, the questionnaire were distributed to the respondents on an individual basis to finish within 20 minutes. The questionnaires were gathered following the fulfillment by the respondents.

Observation was done in the classroom to check and confirm whether the responds given to questionnaire was appropriate and true.

3.6 Data Analysis Plan

So as to report the research questions that were figured to direct the investigation, the information got from the respondents was sifted to evacuate any immaterial responses before coding. The information was then handled with the Statistical Package for Service Solution (SPSS 21.0). The analytical procedures utilized include descriptive statistics (such as frequencies, percentage, mean and standard deviation) and other graphical representations.

CHAPTER FOUR

PRESENTATION AND DISCUSSION OF FINDINGS

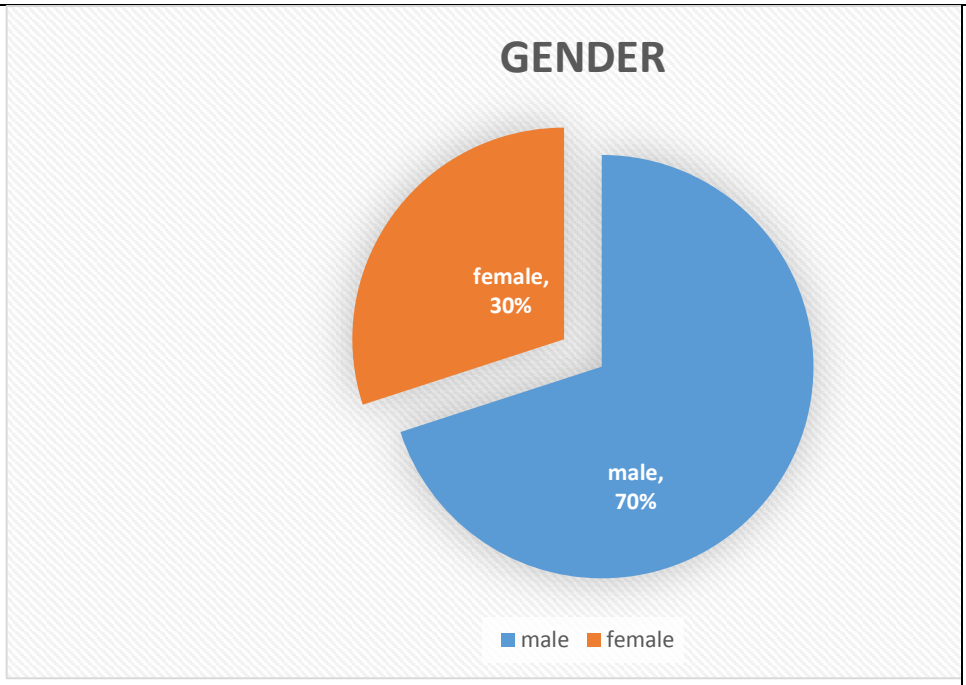
4.0 Overview

This chapter exhibits the aftermaths of the information gathered from the field to study the TPACK of Visual art teachers in Kumasi Metro. This part is introduced in two parts. The first part manages the demographic characteristics of the respondents. The subsequent segment centers on the data to discourse the research question and objectives that were formulated to accomplish the study.

4.1 Demographic Characteristics of the Respondents

Demographic characteristics of the visual art teachers which were considered in this segment included: sex, age and the subject disciplines. These demographic characteristics were viewed as significant in light of the fact that they could help the investigation of the objectives that was figured out. Once more, they would give and enhance the understanding about the class of respondents who were engaged with the investigation. The findings are presented in Figure 2

Figure 2 – Gender of Respondents

Male 24	
Female	6
Total	30

Source: Field Research (2019)

Figure 2 demonstrates that the larger part which dealt with 24 people and constitutes (70%) of the respondents were males while 6 people which constitutes (30%) were females. This demonstrates evidently that there is a gender inequality in the respondents used for the investigation. This will actually not have any negative effect on the finding of this research as the population has been already discussed based on the sampling size.

Table 2: Age of Respondents

Age	Number	Percentage
20-25 years	2	7%
26-30 years	10	33%

31-35 years	6	20%
36-40 years	8	27%
40 years above	4	13%
TOTAL	30	100%

Source: Field Research (2019)

Table 2 demonstrates that 10 respondents representing (33%) of the visual art teachers were between the ages of 26-30 years while 4 of the respondents representing 13% were also 40 years and above which represents the lowest percentage mark. The age conveyance of the respondents is situated inside what Prensky (2001) depicts as 'digital natives'. As indicated by the Prensky, individuals brought into the world 1984 afterwards fall inside this depiction. Consequently, the supposition will be that the Visual Art tutors inside these age ranges may have had the chance to collaborate with the web, computerized cameras, and digital devices that enable them to promptly catch or interface with their reality.

Table 3: Respondents Subject Disciplines

Age	Number	Percentage
CERAMICS	4	13%
GRAPHIC DESIGN AND SCULPTURE	2	7%
GRAPHIC DESIGN AND LEATHER WORK	1	3%
GRAPHIC DESIGN	7	23%
TEXTILES	2	7%
LEATHER WORK	1	3%

PICTURE MAKING	3	10%
SCULPTURE	3	10%
SCULPTURE AND PICTURE MAKING	1	3%
G.K.A	5	17%
G.K.A AND TEXTILES	1	3%
TOTAL	30	100%

Source: Field Research (2019)

From the table above, 3% of the respondents teach Graphic Design and leatherwork, 5% of the respondents teach General Knowledge in Art only, 3% of the respondents teach G.K.A and Textiles respectively. None of the respondents do teach three or more subjects.

4.2 Findings

The sections discusses the information gathered from the field to address the research questions that were set to guide the research. The five point Likert scale questionnaire that was formulated was examined utilizing mean of means and standard deviations. From the investigation, a mean of 3.50 or further demonstrated the statement was agreed by the respondents' and in the process the respondents are not sure of themselves, he means is within 2.41 and 3.40 respectively. When the respondent disagree to the statement, the mean is between 2.40 downwards

4.2.1 Extend to which Visual Art teachers in Kumasi Metro access technology.

This section discusses the Technological Knowledge (TK) of the Visual Art teachers. In view of this, it was necessary for the researcher to ask various question regarding their Technological Knowledge in the process of accessing the technologies of these Visual Art teachers. The findings have been demonstrated in Table 4

Table 4: The Technological Knowledge of Visual Art teachers

STATEMENT	MEAN	SD
I have the technical skills I need to use technology	3.67	1.24
I have the knowledge to learn technology easily	2.52	1.76
I can solve the problems that I encounter when using technology	3.23	1.29
I know different types of technology	3.71	1.11
I can install a new programme that I would like to use	3.52	1.29
I can create and edit a video clip	2.55	1.42
1 can create my own website	2.62	1.38
I can create a basic presentation using PowerPoint or a similar programme	3.51	1.07
Mean of Means/Average Standard Deviation	3.23	1.09

Source: Field Research (2019)

Table 4 displays the consequences of the information gathered on the TK of Visual Art tutors in Kumasi Metro. Dominant part (M = 3.67, SD= 1.24) of the respondents concurred that they had the specialized skills to access technology. The respondents were unrelated in their reactions. In basic terms, Visual Art teachers are able to access technology in their daily life activities. For example, the dominant part (M = 3.71, SD = 0.11) of them were of the view that they had the ability to know different types of technology certainly. This outcome is significant because, technology, like the environs, is not static, thus Visual Art tutors should be prepared to study the newly developing technologies.

Visual Art teachers in this findings were captured to have less idea as to how they can learn technology so easily (M = 2.52, SD =1.76). In the same manner, the Visual Art teachers can install new programs to use (M = 3.52, SD =1.29). Visual Art teachers can also create presentations on their own using PowerPoint or similar program (M= 3.51, SD =1.07). A few of them can create or accessed their own website or video clip respectively (M= 2.62, SD=1.38) and (M = 2.55, SD =1.42).It creates the impression that, despite the fact that visual art teachers appear to be conceivable or connected to technology, their mindfulness on technology isn't at the ideal degree of acknowledgment (Ekrem & Recep, 2014).

In all, the mean of means (M = 3.52) recommends that Visual Art teachers of Kumasi Metro have the technological knowledge and they are able to access technology on their own. In spite of the fact that visual art teachers have technological knowledge and are able to access technology, it is still significant for the visual art teachers to be given support, encouragements and training to better improve their access on technology. Juarez (2014) alerts that technology become obsolete inside 30 days or fewer. In perspective on this, artistic ways must be looked for and created to give the most recent data on a day by day and reliably on-going reason for Visual Art teachers to interface and work with developing computerized gadgets.

4.2.2 Visual Art teachers in Kumasi Metro level of using Technology for classroom activities

The part also seek to discuss the Technological Content Knowledge (TCK) and the Technological Pedagogical Knowledge (TPK) of the Visual Art teachers as the research question demands class activities and content. In view of this, it was also necessary for the researcher to ask various question regarding their Technological Content Knowledge

(TCK) and the Technological Pedagogical Knowledge (TPK) of these Visual Art teachers. These findings have been demonstrated in Table 5

Table 5: The Technological Pedagogical Knowledge (TPK) of Visual Art teachers.

STATEMENT	MEAN	SD
I can use technologies that enhance the teaching approaches for a lesson.	2.57	1.54
I can use technologies that are appropriate for my teaching.	2.22	1.66
I can apply technologies to different teaching activities	2.23	1.79
I can use technology to introduce my students to real world scenarios.	2.41	1.34
I can use technology to motivate students.	2.39	1.99
Mean of Means/Average Standard Deviation	2.24	1.39

Source: Field Research (2019)

Visual Art teachers in Kumasi Metro having the node to utilize means that can viably encourage the lessons approaches during the conveyance of the subject content. Technology is by all accounts one of such viable apparatuses in encouraging the teaching approaches

In the previous outcomes asserted that Visual Art teachers in Kumasi Metro have access as to the use of technology. Meanwhile the result of this research question suggests that the Visual Art teachers in Kumasi Metro in the Ashanti region of Ghana are perhaps uncertain regardless of how they can utilize technology to upgrade their teaching approaches (M = 2.22, SD = 1.66).It was, therefore, not astounding that the Visual Art

teachers insinuated the way of becoming aware of certain technologically enhancing characters. For instance, dominant part (M = 2.57) of the respondents differ to the explanation that they could utilize technology in their teaching approaches. The appearing implication presented by this study is that despite the fact that visual art teachers have technological knowledge, they can't incorporate it into their pedagogical approaches

The general mean of methods (M = 2.25) recommended that Visual Art teachers in Kumasi Metro Technological Pedagogical Knowledge was moderately low. This inferred that, generally, there was a separation between teachers' information of knowledge and their capacity to adroitly utilize their insight to influence their methodological capabilities. Despite what might be expected, Owusu (2014), in his investigation stated that teachers could pick and apply technologies that were proper for various educating activities

Table 6: The Technological Content Knowledge (TCK) of Visual Art teachers

STATEMENT	MEAN	SD
I know how my subject matter can be represented with the application of technology	2.12	1.34
I know about technologies that I can use for enhancing the understanding of specific concepts in my subject matter.	2.22	1.23
I can use appropriate technologies (e.g. multimedia resources, simulation) to represent the content of my teaching subject	2.10	1.19
I can use technology representations (i.e., multimedia, visual demonstrations, etc.) to demonstrate specific concepts in my subject matter	2.11	1.27
Mean of Means/Average Standard Deviation	2.09	1.3

Source: Field Research (2019)

In respect to Table 6: Visual Art teachers' capacity to figure out which explicit technology can be utilized in teaching subject explicit content which is essential to the extent (PCK) is concerned. Results from this Table 6 demonstrate Visual Art teachers (PCK). As observed from Table, (M= 2.12, SD = 1.34) of the Visual Art tutors revealed that they are not aware of technology helping them in their subject content. This suggests when given explicit cluster of technologies, Visual Art teachers would think that it's hard to choose reasonable technologies to present the teaching of their respective subject matter. It is due that, Visual Art teachers are probably going to be familiar with the traditional technologies, for example, the chalk, blackboard, pens, books and numerous others.

Mean of means (M = 2.09) shows that Visual Art teachers (TCK) is generally low. Technologies appear to exist, among numerous things, to assist teachers in developing

and advancing their instructions. this period of learning explosions brought about trouble on teachers in guaranteeing them that they stream with current truth and certainty that are innovatively informed (Toyama, 2011).Teaching instructions are made of clarifications, addressing and activities so as to cultivate clear view of the subject content. Instructors' powerlessness to exhibit authority of content and pedagogic capability even with innovation is probably going to make their classroom boring and insufficient, combined with precluded in depth understanding from securing idea with respect to students.

4.2.3 The competences of technology integration by Visual Art teachers in Kumasi Metro.

This section deals with the Technological Pedagogical content knowledge of Visual Art teachers in Kumasi metro. It further describes the competences of Visual Art teachers in integrating technology into their classroom activities through content, pedagogy and knowledge. Table 7 describes the finding in a tabular form.

Table 7: The Technological Pedagogical Content Knowledge (TPCK) of Visual Art teachers

STATEMENT	MEAN	SD
I can teach lessons that appropriately combine my subject matter, technologies and teaching approaches.	2.10	1.14
I can select technologies to use in my classroom that enhance what I teach, how I teach and what students learn	1.82	1.13
I can use strategies that combine content, technologies, and teaching approaches in my classroom	1.80	1.10
I can find and use online materials that effectively demonstrate a specific principle in my subject area.	2.09	1.17
Mean of Means/Average Standard Deviation	2.07	1.21

Source: Field Research (2019)

Table 7 demonstrates that dominant part (M= 2.10, SD= 1.14) of the Visual Art tutors showed that, they couldn't instruct lessons that suitably joined their topic, technology and teaching approaches. Prior results on this investigation proposed the low learning of technology in their teaching methodologies. Because of this test, other part (M = 2.09, SD = 1.17) of the Visual Art teachers also suggest that, few of the teacher use online contents effectively to exhibit a precise value in their subject area.

More or less, the mean of means (M= 2.07) shows that Visual Art teachers (TPCK) is moderately low due to this the competences of using technological tools or devices to integrate technology into classroom pedagogy and content is low and this would hinder powerful teaching in this 21st century study halls (Guzey,&Roehrig, 2009)

4.2.4 The Barriers and Concerns preventing Technology Integration by Visual Art teachers

The research question four seeks to identify the hindrances that is preventing Visual Art teacher from integrating technology into their Pedagogy and content knowledge. Previous finding have made us aware of the low (PCK) and (TCK) also low competences in integrated technology into classroom activities. These findings has been documented in Table 8

Table 8: The Barriers and Concerns preventing Technology Integration by Visual Art teachers.

STATEMENT	MEAN	SD
Lack of good instructional software	4.10	0.19
Inadequate training opportunities	3.82	1.00
Lack of release time for teachers to learn/practice/plan ways to use computers or the internet	3.00	1.10
Lack of funding to purchase desired technology (equipment or programs)	4.02	1.19
Not enough computers	3.90	0.81
Mean of Means/Average Standard Deviation	3.97	1.21

Source: Field Research (2019)

Table 8 demonstrates that, the dominant part (M = 4.10, SD = 0.19) of the Visual Art teachers shows the barriers preventing how to integrate technology into the classroom, there are few provision of software which will be suitable for giving out instructions in the classroom. In the same place most of the teachers lack access to computers within school campuses and homes ((M = 4.10, SD = 0.19)

The mean of mean indicates that, there are barriers and hindrances that prevent Visuals Art teachers from integrating technology into their instructions and per these analysis, Visual Art teacher are not having good instructional software to deliver their classroom subject matter, Teachers are not having aptitude time to plan and other their subject content using computers and the internet. In the other findings, Visual Art Teachers have inadequate computer to support their teaching content.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Overview

This chapter talks about the summarization of the research and it further deliberates and concludes the findings and suggest possible recommendations to back the findings

5.1 Summary of the Study

The aim of this investigation was to investigate the TPACK of Visual Art teachers in Kumasi Metro to know how they use and integrate technology into their classroom activities and lesson. In view of this, Research questions were formulated based on the objectives of the study.

1. To what extend are visual art teachers in Kumasi Metro accessing technology?

2. To what level are Visual Art teachers in Kumasi Metro using Technology for classroom activities?

3. What are the competences of technology integration by Visual art teachers in Kumasi Metro?

4. What are the barriers and concerns preventing technology integration by Visual art teachers?

Qualitative research method based on descriptive survey design was used for the study. Questionnaire was formulated based on TPACK Questionnaire serving as an instrument for testing the Visual Art teachers in Kumasi Metro. Four public Senior High Schools in Kumasi Metro were selected for the study. These were

i. Asanteman Senior High School, Kumasi

ii. Adventist Senior High School, Bantama

iii. Kumasi Senior High Technical School, Patasi

iv. KNUST Senior High School, Boadi

Out of these school, 30 respondents out of 35 respondents were selected to fill out the questionnaire which was formulated. Statistical Package for Service Solution (SPSS 21.0) and Graphical representations of Charts and tables were used to analyzed the data. These are the main findings of the research:

1. The research reviewed evidently that, there was a gender inequality in the respondents used for the study
2. The research also reviewed that, about 60% of the respondents were between the ages of 20 – 35 and brings forth the assumption that the Visual Art teachers may have access and interaction with Technology as describe by Presnky(2001).
3. Visual Art teachers of Kumasi Metro have the technological knowledge and they are able to access technology on their own. In spite of the fact that visual art teachers have technological knowledge and are able to access technology
4. Visual Art teachers in the Kumasi Metro (TCK) and (PCK) are moderately low.
5. Visual Art teachers (TPCK) is moderately low due to this the competences of using technological tools or devices to integrate technology into classroom pedagogy and content is low and this would hinder their successes in classroom subject delivery.
6. There are barriers and hindrances that prevent Visuals Art teachers from integrating technology into their instructions.

5.2 Conclusions:

In respect to the findings that came out from the research, the following conclusions was formulated. Visual Art teachers in Kumasi Metro can access and this is so because they are having Technological Knowledge (TK). By this, Visual Art teachers in Kumasi Metro would value the utilization of rising digital technologies in the instructing and learning process.

Furthermore, the absence of TPK of Visual Art teachers in Kumasi Metro suggests that the Visual Art teachers would receive instructional teaching methods that are without rising computerized advancements in their teaching methods. Once more, the classrooms of these Visual Art teachers are probably going to lackluster since the Visual Art teachers would not utilize proper technology that may in the teaching and learning process.

Again, Visual Art teachers in Kumasi Metro were missing TCK. In reality, Visual Art teachers in Kumasi Metro are probably going to depend more on reading material and other conventional materials to introduce their topic than technologies

Furthermore, Visual Art teachers in Kumasi Metro competences in integrating technology in their teaching method is low this is because the needed TPCK is low. This suggests Visual Art teachers in Kumasi Metro may think that it is hard to utilize technology abilities, academic practices and subject content that may toughen to the advantage of the student.

Above all, there seems to be a gap that hinder Visual Art teachers in Kumasi Metro their use of technology in their classroom activities. This will prevent the smooth desire in using these technologies in their subject content, there should be proper and enough training for these Visual Art teachers to exhibit what they can do best in respect to the use of technologies.

5.3 Recommendations:

From the Findings and conclusions, the following recommendations were suggested for the study.

1. The Teacher Training Institutions (UEW, UCC, KNUST) ought to restructure their course programs to help Visual Art teachers improve more on their Technological content Knowledge.
2. The Government of Ghana together with GES should capitalize on this research provide frequent workshop for Visual Art to aid them on how the can easily integrate technology into their classroom instructions.
3. The G.E.S and the Government of Ghana should grant more scholarships and study leave to Senior High Schools Visual Art teachers to improve their professional and technological competences.
4. The Ministry of Education, GES and Ghana Government should provide funds for the purchase of common technological tools such Computers, projectors and others for Senior High School Visual Art Teachers
5. The GES and the government should provide good and effective instructional software for these Visual Art Teachers to aid in their classroom instructions.

5.4 Recommendation for Further Studies

1. Further studies ought to be done on this similar topic on a bigger or more schools across various municipalities, Districts and other regions in Ghana.

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APPENDIX A

TPACK QUESTIONNAIRE FOR VISUAL ART TEACHCERS

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF ART AND BUILT ENVIRONMENT

DEPARTMENT OF EDUCATIONAL INNOVATIONS IN SCIENCE AND TECHNOLGY

TECHNOLOGICAL PEDAGOGICAL AND CONTENT KNOWLEDGE (TPACK) QUESTIONNAIRE FOR VISUAL ART TEACHERS

The purpose of this survey is to investigate the technological pedagogical and content knowledge (TPACK) of Visual Art Teachers in Ashanti region to find out their efficient integration and use of technologies in the teaching of the Visual Art subjects in Senior High Schools.

Instructions

Kindly answer the questions that are in this questionnaire. Using the scales assigned to each statement, indicate by ticking (√) the appropriate bracket that answers the questions. Please tick [√] the correct response from the options given.

Participation in this study is voluntary and confidential, and you can choose to exit the survey at any point. Required questions are indicated with asterisk (*). This survey should take less than 20 minutes to complete. your cooperation is highly appreciated

* Required

1. **School**
Please indicate the school you surveying within/for by selecting one of the schools below
Mark only one oval.

- ASANTEMAN SENIOR HIGH SCHOOL, KUMASI
- KUMASI SEC TECH. SCH, PATASI
- ADVENTIST SNR HIGH SCHOOL, BANTAMA
- KNUST SNR. HIGH SCHOOL, BOADI

2. **Subject/Discipline Area(s)** *
Indicate the visual art subject(s) teaching

_____

Demographic Information

3. **Gender** *
Mark only one oval.

- Female
- Male
- Prefer not to say
- Other: _____

4 **Age** *
Mark on y one ova

- 20-25
- 26-30
- 31-35
- 36-40
- Above 40

TECHNOLOGICAL KNOWLEDGE (TK) OF VISUAL ART TEACHERS

Please indicate the extent of your agreement or disagreement with the statement by ticking [√] Strongly Disagree, Disagree, Uncertain, Agree, and Strongly Agree (please select only one) to reflect your opinion

5. **statement** *
Check all that apply.

	STRONGLY DISAGREE	DISAGREE	UNCERTAIN	AGREE	STRONGLY AGREE
I have the technical skills I need to use technology	☐	☐	☐	☐	☐
I have the knowledge to learn technology easily	☐	☐	☐	☐	☐
I can solve the problems that I encounter when using technology	☐	☐	☐	☐	☐
I know different types of technologies	☐	☐	☐	☐	☐
I can install a new program that I would like to use	☐	☐	☐	☐	☐
I can send an email with an attachment	☐	☐	☐	☐	☐
I can save an image from a website to the hard drive of my computer	☐	☐	☐	☐	☐
I can create a basic presentation using PowerPoint or a similar programme programme	☐	☐	☐	☐	☐

TECHNOLOGICAL CONTENT KNOWLEDGE (TCK) OF VISUAL ART TEACHERS

Please indicate the extent of your agreement or disagreement with the statement by ticking [√] Strongly Disagree, Disagree, Uncertain, Agree, and Strongly Agree (please select only one) to reflect your opinion

	STRONGLY DISAGREE	DISAGREE	UNCERTAIN	AGREE	STRONGLY AGREE
I can use technologies that enhance the teaching approaches for a lesson	☐	☐	☐	☐	☐
I can use technologies that enhance students' learning of a lesson.	☐	☐	☐	☐	☐
I can use technologies that are appropriate for my teaching	☐	☐	☐	☐	☐
I can apply technologies to different teaching activities	☐	☐	☐	☐	☐
I can use technology to assess students learning	☐	☐	☐	☐	☐
I can use technology to introduce my students to real world scenarios	☐	☐	☐	☐	☐
I can assist my students to use technology to plan and monitor their own learning	☐	☐	☐	☐	☐
I can assist my students to collaborate with each other using technology	☐	☐	☐	☐	☐
I can use technologies to motivate students	☐	☐	☐	☐	☐
I can use technologies to improve my teaching skills	☐	☐	☐	☐	☐

Technological Pedagogical Content Knowledge (TPCK) of Visual Art Teachers

Please indicate the extent of your agreement or disagreement with the statement by ticking [√] Strongly Disagree, Disagree, Uncertain, Agree, and Strongly Agree (please select only one) to reflect your opinion

	STRONGLY DISAGREE	DISAGREE	UNCERTAIN	AGREE	STRONGLY AGREE
I can teach lessons that appropriately combine my subject matter, technologies, and teaching approaches	☐	☐	☐	☐	☐
I can select technologies to use in my classroom that enhance what I teach, how I teach, and what students learn	☐	☐	☐	☐	☐
I can use strategies that combine content, technologies, and teaching approaches in my classroom	☐	☐	☐	☐	☐
.I can use technology to facilitate scientific inquiry in the classroom	☐	☐	☐	☐	☐
I am able to use technology to create effective representations of content that departs from textbook approaches	☐	☐	☐	☐	☐
I can structure activities to help students to construct different representations of the content using appropriate technologies (e.g., Webspiration, Mindmaps, Wikis)	☐	☐	☐	☐	☐
I can create self-directed learning activities of the content knowledge with appropriate technologies (e.g., Blogs, Webquests).	☐	☐	☐	☐	☐
I can design inquiry activities to guide students to make sense of the content knowledge with appropriate technologies (e.g., simulations, web-based materials)	☐	☐	☐	☐	☐

Technology Barriers for Visual Art Teachers

Please indicate to what extent, if any, each of the following are barriers to your use of technology for instruction

	STRONGLY DISAGREE	DISAGREE	UNCERTAIN	AGREE	STRONGLY AGREE
Not enough computers	☐	☐	☐	☐	☐
Lack of good instructional software	☐	☐	☐	☐	☐
Inadequate training opportunities	☐	☐	☐	☐	☐
Lack of release time for teachers to learn/practice/plan ways to use computers or the internet	☐	☐	☐	☐	☐
Lack of funding to purchase desired technology (equipment or programs)	☐	☐	☐	☐	☐
Lack of time in schedule for students to use technologies in class	☐	☐	☐	☐	☐