UNIVERSITY OF CAPE COAST

EFFECT OF EDUCATIONAL VIDEO ON STUDENTS WHEEL THROWING SKILLS IN THE SENIOR HIGH SCHOOLS OF CAPE COAST METROPOLIS

GRACE RUTH MORRISON

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BY

GRACE RUTH MORRISON

Dissertation submitted to the Department of Information Technology in Education of the College of Distance Education, University of Cape Coast, in partial fulfilment of the requirements for award of Master of Education Degree in Information Technology

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DECLARATION

Candidate's Declaration

I hereby declare that this dissertation is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature:…… Date:……

Name: Grace Ruth Morrison

Supervisor's Declaration

I hereby declare that the preparation and presentation of the dissertation were supervised in accordance with the guidelines on supervision of dissertation laid down by the University of Cape Coast.

Supervisor's Signature:…….. Date:……

Name: Professor Kankam Boadu

ABSTRACT

The principal purpose of the study was to ascertain the effect of educational video on the teaching and learning of wheel throwing skills in Senior High School (SHS) of Cape Coast Metropolis. The researcher used descriptive research method in the form of survey for the study. The main research instruments used to collect data from teachers and students was questionnaire. A sample size of 126 SHS teachers and students were selected for the study through stratified sampling technique. It was revealed from the study that there are differences in the perception of both teachers and students on teaching and learning wheel throwing skills in ceramics education. Also, the results portrayed that there are differences in the opinions of both teachers and students on the availability of ceramics resources for teaching and learning wheel throwing skills in the senior high schools. Finally, the study found out that there are no differences in the effect of educational video in teaching and learning wheel throwing skills in ceramics education. Based on the findings from the study, the following recommendations were made; there should be more time allocation on the schools' time table to allow for effective Visual Arts practical lessons including the teaching and learning of educational video, management of the SHS should procure state of the art equipment to furnish the Visual Arts studio/ laboratories in their schools and Management of the schools should contact the old students' associations of their schools to provide funding for the procurement of state of the facilities for the Visual Arts department.

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I wish to finally thank my family for their support, especially my father, Rt. Reverend Jeremiah Amo Morrison and my twin sister, Sophia.

DEDICATION

To my family

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CHAPTER ONE

INTRODUCTION

Background to the Study

Pottery (Ceramics) refers to the act of forming a clay body into objects of a required shape and heating them to the required temperatures in a kiln which removes all the bonded water from the clay, inducing reactions that lead to permanent change. Pottery includes earthenware, stoneware and porcelain. A clay body can be decorated before or after firing (Barnett & Hoop, 2005).

In light of this, Cooper (2010) asserted that pottery is a kind of craft which requires retentive training. The only way to achieve this retentive training is to practice in repetition till the skill has been absorbed into the hands and body of the students. Saibu and Okwo (2013) found that the most obvious problematic achievement in pottery skill is 'wheel throwing' skill. Wheel Throwing is one of the most exciting production skill employed in the production of ceramics ware. It is a systematic process of manipulating a ball of clay on a potter's wheel to produce a pot (Nelson, 2008). Teaching and learning by 'wheel throwing' is a fundamental skill that every Visual arts student should have. Wheel throwing skill provides a lot of virtue to overall ceramics making, not only for pottery yet not every Visual arts student would take wheel throwing skill in ceramics as their priority (Stanglin, 2012).

It is important for us to know that learning wheel throwing skill is very crucial and useful to Visual arts students especially in the pattern of pottery production. Students are often limited in exposure, or worse, not given the

opportunity to experience working in clay. Hands-on skills are not easy to teach due to the struggle of describing skills and how the hands should act (Sennett, 2009). Ewule (2004) found that the current ceramics teaching in Nigerian schools and colleges is unscientific, poor and not organized to produce sound knowledge ceramics teachers. This could be due to the lack of modern educational technologies, equipment and adequate materials in the schools for proper foundations of teaching and learning of wheel throwing skills in ceramics lessons.

This suggests that in every educational institution, educational technologies, facilities, instruments, materials, equipment and competent teachers for instruction are very important for the effective teaching and learning process in Ghana. Ceramics teachers need to know which instructional materials and pieces of equipment are appropriate and relevant for the teaching-learning situation. Owen (2003) stated that educational technologies are educator's tools. They are used in classrooms to improve teaching and effect learning. Educational video is a form of multimedia that conveys information through two simultaneous sensory channels: aural and visual. It often uses multiple presentation modes, such as verbal and pictorial representations in the case of on-screen print and closed-captioning (Mayer, 2001). This multiplicity means that video communicates the same information to students through simultaneous learning modalities and can provide students with multiple entry points into the content (Gardner, 2006).

The use of educational video presentations may help to provide the required guidance, assistance, demonstration and time by teacher to students in wheel throwing skills thereby improving their achievement in throwing theory. It

may further provide the students the opportunity to replay any segment of the instruction at leisure time thereby aiding students understanding as well as improving their achievement in theory tests in wheel throwing skills. In the use of instructional technology video, audio presentation appeals to the sense of hearing only while video presentation appeals to both the senses of hearing, sight and motion (Okwo & Ike, 2005). These variables may interact with spatial ability which is the ability to perceive the construction of an object in both two and three dimensions to enhance student achievement in theory in throwing on a potter's wheel (Gardner, 2005).

Travis (2014) found that educational video or film helped students develop wheel throwing skills through ceramics making, as it gave them access to how other people manipulated clay, enabling them to realize some of the errors in their own making process. This self-reflective process, along with suggestions and feedback from teachers allowed students to develop their own skills as a maker. Fitch and McAndrew (2015) revealed that video shows mainly parts of the wheel throwing skills process, as well as the environment that the potters work in. The educational video comes with narration and it explains the work that is being produced during the day. Nelson (2008) found that students show higher rates of acquisition retention of material when presented via technology.

According to Jacoby (2007), the nature of the method of instruction in most art (technical) courses must be directed toward developing original thinking and diagnosis rather than trial and error application. This necessitates the use of educational technologies and laboratory method in teaching and learning of wheel

throwing skills in ceramics lessons rather than the job or project, type or demonstration-analysis. In Ghana, there is a need for additional opportunities in the ceramics arts for both students and teachers. Using clay in the classroom is a valuable experience.

Statement of the Problem

Teaching and learning wheel throwing skills is a fundamental skill that every Visual arts student should have. The Senior High School Syllabus requires student to demonstrate adequate skills in wheel throwing. The conventional technique for teaching wheel throwing skills is the verbal instruction and the face to face demonstration. However, these techniques appear not to provide the students with the adequate guidance, assistance and time required by the teacher to teach and demonstrate wheel throwing skills adequately.

According to Egbeji (2000), the shortcomings in these techniques (the verbal instruction and the face to face demonstration) of teaching wheel throwing skills results in student poor achievement.

Saibu (2011) conducted a study on the topic "effects of audio, video demonstrations and spatial ability on students' performance in throwing on a potter's wheel" and found out that, the only way to master the skill is to "keep throwing" and collect milestones by the difficulty of the technique and form. The reports from the various Heads of Arts Department of Senior High Schools within the Cape Coast Metropolis consistently indicate that visual arts students offering Ceramics did not satisfactorily answer questions related to wheel throwing skills in their final year exam project work and written essay. This results in poor

academic performance in the WASSCE result. The reports also shows lack of mastery of wheel throwing skills, inappropriate way of handling tools and materials by the students, as reported in the Chief Examiner's general comments over a period (2011 – 2016). I believe that when Visual arts students receive video based instruction for a series of visual arts lessons especially on wheel throwing skills, they will develop artistic skills and art content knowledge more successfully than through traditional pedagogical methods such as teacher lectures, direct instruction and student note taking. Therefore, the study aims to investigate the effect of educational video on students wheel throwing skills in the Senior High Schools of Cape Metropolis.

Purpose of the Study

The main objective of the study was to examine the effect of educational video on students wheel throwing skills in the Senior High Schools of Cape Coast Metropolis. The following are specific objectives of the study:

1. Assess the effects of educational video on teaching and learning of wheel throwing skills.
2. Examine the perception of teachers on the use of educational video in teaching and learning of wheel throwing skills in ceramics education.
3. Examine the perception of students on the use of educational video in teaching and learning of wheel throwing skills in ceramics education.
4. Ascertain the challenges in using educational video for teaching and learning of wheel throwing skills in ceramics education.

Research Hypotheses

In line with the above objectives, the following hypotheses were formulated to guide the study;

H0 1: There is no statistical significant difference in the perception of teachers on teaching and learning wheel throwing skills in ceramics education in the Senior High Schools.

H0 2: There is no statistical significant difference in the perception of students on teaching and learning wheel throwing skills in ceramics education in the Senior High Schools.

H0 3: There is no statistical significant difference in the opinions of teachers and students on the availability of ceramics resources for teaching and learning wheel throwing skills in the Senior High Schools.

H0 4: There is no statistical significant difference in the effect of educational video on teaching and learning of wheel throwing skills in the ceramics education.

Significance of the Study

The outcome of the study will provide data on the effects of educational video and conventional demonstrations of wheel throwing skills on student achievement in theory test. By combining a visual arts lesson with technology via video modeled lessons, students may learn at higher levels when compared to traditional lessons. This research seeks to show teachers from every field the importance of integrating more video based instructions into their teaching. The

outcome of the study may provide data on the status of ceramics educational facilities, equipment and materials available in the Cape Coast Metropolis.

The findings of the study will equally be a reference material for Ministry of Education, Ghana Education Service, Educational Administrators, Planners, Teachers and Parents, Colleges of Education, Resources Persons, State and Federal Government. This will in no small way assist them in the proper planning of the Ceramics Education Programme. It may also assist planners in Education to formulate strategies that may ensure that the adequate facilities, equipment, and materials are provided.

The result of the study will help to strengthen the foundation of students all over the nation and in the world, at large. The result of the study could be used to develop possible solutions and suggestions that can contribute to making teaching and learning of wheel throwing skills in ceramics education to be effective. In addition, this study may be significant to both the fields of art education and special education because this research could provide the foundation for integrating this video based approach into general arts education classroom and other content areas. This study will contribute to the literature about the effectiveness of video based instruction and its use as a tool to increase students' ability to learn.

Delimitation of the Study

Several issues such as unavailability or inadequacy of resources for teaching and learning wheel throwing skills may contribute to the poor academic performance or lack of mastery of wheel throwing skills. However, this study

looks at the effect of educational video as a teaching technique to improve wheel throwing skills in students. According to the Simmons (1973), Central Region has abundant clay which is the local material for Ceramics. As a result, the Metropolis has the highest number of Senior High Schools offering Ceramics hence the delimitation of the study to the Cape Coast Metropolis. The study was delimited to Form three (3) Visual Arts students and teachers in the senior High Schools in Cape Coast Metropolis. This is because "Wheel Throwing as a skill" is an exclusive topic reserved for mostly the year three students.

Limitations of the Study

The descriptive research design was employed during the study. The main weakness of the descriptive design was lack of opportunity to collect additional information. The researcher had the feeling that some participants might have failed to give truthful responses or avoided questions on issues that concerned them directly. The possibility of subjectivity in responses by the participants in the descriptive research was noted. For example, the items of the researcher were predetermined and prescriptive in nature. A potential limitation of this study was that it was filled in the absence of the researcher. The respondents were made to give honest and truthful responses since this is an academic work. The respondents were assured of their confidentiality in filling the questionnaire.

Organization of the rest of the Study

This study is divided into five chapters. The first chapter deals with the background to the study, statement of the problem, purpose of the study, research hypothesis, delimitation and limitations of the study. The second chapter

constituted a review of related literature on the topic studied. In chapter three, the methodology for the study was explained. This comprised the research design, population, sample and sampling procedure, instrumentation, validity, reliability and mode of collecting data and its analysis. Chapter four dealt with data presentation and analysis, and finally, the fifth chapter discussed summary of findings, conclusions, recommendations, and suggestions for further research

CHAPTER TWO

LITERATURE REVIEW

Introduction

The purpose of this chapter is to review literature related to the study. The chapter is organized under the following sub-headings: overview of Visual arts programme in Ghana, Visual arts syllabus, the concept of ceramics, teaching and learning of ceramics, techniques of wheel throwing skills, importance of teaching ceramics in schools, basic ceramics materials, importance of clay in teaching wheel throwing skills and using educational video in teaching wheel throwing skills in ceramics, how educational video promote wheel throwing skill learning and challenges of infusing technology in visual arts education in Ghana (Empirical review and Conceptual framework)

Overview of Visual arts Programme in Ghana

Both Macmillan English Dictionary for Advanced Learners (MEDL) (2002) and Cambridge International Dictionary of English (CIDE) (1995) define visual arts as those types of art in which things are made for people to look and enjoy. The examples they cite are paintings, drawings and sculptures. This is as opposed to performing art, where music, dance, drama, poetry dominate. The Encyclopedia Britannica (2003) states, in the twentieth century colleges and universities recognize the visual arts department to be treating painting, sculpture and sometimes architecture. Mention is also made of the usefulness of art which is the concern of aestheticians and critics. According to Amadi and Okechukwu (2016), instruction on aesthetics provides enjoyment and enrichment of aesthetic

faculties or psychological benefits. The students are able to enjoy life in a civilized way and contribute something to cultural life of the communities in which they live. This is an expectation of the Ghanaian philosophy which seems difficult to achieve.

Amenuke, Dogbe, Asare, Akiyu and Baffoe (1991) grouped Art under visual and performing, and were of the opinion that, Visual arts are arts which are perceived by visualizing. These two forms are different from liberal arts which fall under general arts education programme. The performing and visual arts sound the same, but the distinction here is that the visuals are the tangible forms that, apart from being looked at, can be held or touched or stored in their original form, unlike the performing arts which only can be seen or heard and can be stored only through recording on tapes, photographs etc, whiles the visuals can be recorded through the same means. They said through the education reform programme, the traditional crafts have been elevated and are being studied individually on their own merits.

The visual arts discipline as pursued in Ghana, is a discipline meant to be studied over a three-year period like other SHS programmes to qualify learners for entry into tertiary institutions. To Amenuke et al (1991), the Visual arts programme includes Sculpture, Painting, Textiles, Pottery/Ceramics, Beadwork, Basketry, Calabash, Leatherwork, Metalwork, Architecture, Blacksmithing, Goldsmithing, and Body Art, as well as General Knowledge in Art. Each of these disciplines has its own curriculum and syllabus. But one is not expected to study all subjects. Rather, students choose two of the options in addition to General

Knowledge in Art which is compulsory. The programme is designed to equip students with knowledge and skills that enable them further their education if they wish, or fit into various sectors where their services would be needed, or establish their own small scale industries and be self-employed, as well as employ and train other people to provide gainful employment.

Amenuke et al (1991) have also observed that some educated Ghanaians look down on art and artists based on the wrong notion that those who study art are unable to cope with "more difficult" subjects like mathematics, science, medicine or engineering. Some of those with this attitude would persuade their children to opt for science in preference to art. In other words, the visual arts department is the waste paper basket where students who fail to perform creditably are dumped. Many of those students who are diverted to courses of study other than their preferred art, turn out not to perform well in these areas selected for them by their well-meaning but ignorant parents and guardians. The Ghanaian society is strewn with frustrated young men and women who could have attained greater heights in art education had they been allowed to pursue their own chosen fields.

Notwithstanding the views of the ignorant in society, visual arts education has been recognized to be basic for developing fully literate citizens (Chapman, 1978). In view of this, stakeholders in education were to empower students develop their aesthetic literacy to aid their understanding of the communicative nature or language of visual arts which serve as teaching aids that go a long way to enhance their intellectual skills. The visual arts have communicative power and

are vivid, which students can interpret, identify and master their symbolic characteristics. This is more important in our society where more information is transmitted visually. Through art education students develop a structure for responding to and symbolizing their experiences. The resultant effects are seen in information of enduring attitudes, values and satisfaction. In this sense, they derive pleasure from their accomplishment by becoming flexible and confident through direct experiences with the visual arts forms. It has the creative potential of producing art works as the study of heritage of art as the critical study of art forms. As part of basic learning, visual arts provide opportunities for self-discovery and creative expression for all students. Through visual communication students from other programmes either than art benefit from the visual arts by expanding their visual and aesthetic potentials. Assessing the importance outlined, Chapman (1978) strongly advocates for learners from kindergarten, throughout their education to high school, should have the opportunities to learn through the visual arts experiencing all the four content areas.

Meanwhile, for the visual arts to maintain its integrity as a discipline, it should, at certain times be separated as we have the visual arts department in our education system. This is to develop special capabilities in students to preserve the artistic heritage. It is further suggested the visual arts framework should help education in all disciplines fulfill their responsibilities to teach visual arts as well as verbal skills. As a resource, the framework should assist school staff, advisory committees and others to develop visual arts curricula, organise teacher preparation programmes, evaluate instructional materials for visual arts education,

and plan programmes to involve students in all of the arts (Wilson & Koroscik, 1992). Chapman (1978) said in recent times, that research has strongly endorsed visual arts education in every classroom to every child, but the question is how effective is it done?

Visual arts Syllabus in Ghana

The Visual arts Syllabus categorically requires that, the Visual arts course embraces all the art activities that end up in a visual, and should equip graduates with vocations since several vocations are possible to be acquired in each of the art course. They include Ceramics, Picture Making, Leatherworks, Graphic Design, Sculpture, Basketry, and General Knowledge of Art, Jewellery, and Metalwork among others. The West African Examinations Council outlines the syllabuses and regulations for each subject.

Wheeler (as cited by Essiam, 1997) states that, the last stage of the curriculum process is evaluation based on measurement and assessment, which allows us to compare the actual outcomes with the expected outcomes in order to arrive at conclusions. Evaluation highlights on whether objectives have been realized or not and to what extent. A study by Essiam (1997) on the impact of the ceramics course in the SSS in Cape Coast as a basis for determining the effectiveness of the education reform programme, particularly in visual arts, found that ceramics had registered significant impact on the SSS graduates by providing them with theoretical and practical knowledge for further education or self-employment; making people aware that indigenous pottery could be

improved upon, and that setting up ceramics industry involved modest means of resources.

Essiam (1997) recommended, in that connection, the government should intensify ceramics teaching by training and sustaining more teachers, furnishing facilities, reviewing and restructuring the programme. He also urged government to reactivate collapsed factories by tapping expertise from especially, KNUST and other personnel from other sources, and suggested that, school administrators should not discriminate against art subjects, but all stakeholders must support the department; parents should encourage their wards to study art and provide guidance and counseling, while the students themselves supply washed clay to Saltpond Ceramics Factory to subsidize their fees.

Aidoo (1995) saw art in general as providing students with careers as independent artists, potters and designers in industry, or specialists in education. However, he noted that, although the ceramics department had started with enough facilities, highly qualified teaching and non-teaching personnel, abundant local raw materials base and well-structured syllabus for the realization of its intended goal, little had been achieved beyond producing the graduates, and he called for evaluation from time to time to determine the problems militating against success. Aidoo (1995) also took cognizance of the fact that ceramics currently combined art and science and, therefore, called for a new programme for SHS graduates starting the degree course. The ceramics course structure had to be tailored to suit modern technological and industrial requirements of the country. Most students' theses and project works could be directed to ceramics problems.

Vocation training is to be organized for students as they stood the chance of being exposed to new materials, machines and experiences not available in the university. Research and publication had to be seriously encouraged and demanded as criteria for academic aspiration among teaching staff. The place of polytechnics in tertiary education with respect to national development came under scrutiny to establish a clear-cut difference between them and the universities (Scott, 1995). Since there was no such clarity about their role in relation to the universities, the Kwami Committee was set up by government through the National Council for Tertiary education (NCTE) to study specific aspects of polytechnic education in Ghana with the view to upgrading the polytechnics. The Committee reported that the objectives were only partly achieved; integration of institutions had not been completed; they had registered increase in enrolment yet education standards were not being attained; income generation was to be improved as the scheme was undermining the financial sustainability that was envisaged at the onset (Herriot, Crossley, Juma, Waudo, Mwirotsi & Kamau, 2002). Finally, the polytechnics were not equipped to meet tertiary standards. The reasons for these were offered:

1. No strong institutional framework to monitor the implementation of the necessary actions. This served as the major weakness between implementation and monitoring as NCTE did not have at its disposal the resources or authority to perform its tasks effectively.
2. The Committee recommended that, to close the institutional gap, there should be proper liaison and coordination while NCTE did the monitoring.

3. Lack of adequate preparation prior to implementation of policy; inadequate planning and failure to fully assess the needs of institutions before preparing white paper.
4. The Committee advised that adequate laboratory space to be provided for the student numbers expected since within the seven years of the policy's existence, they were nowhere near reaching the target.
5. The inability to develop sustainable financing arrangement. This was apparent in the constant litany of complaints scattered throughout the report. This led to three key proposals being made in respect of:
   a) Introduction of fee paying policy;
   b) Review of eligibility for students' loans;
   c) Selective employment policy.

It was also proposed that the general public be made to understand the need for policy alternatives and the need for more dialogue between the Ministry of Education (MOE) officials, banks and tertiary institutions, in other words, intensify the involvement of stakeholders in conception, planning and implementation of selected policies. Finally, government had to show greater commitment in dealing with the paper as well as the white paper to be integrated into Ghana's education policy.

The Concept "Ceramics"

The word "Ceramics" comes from Greek *Keramos*, which means "Burnt earth". Ceramics have been used since the earliest civilization. The field of ceramics materials has its roots in more traditional aspects of the subject like clay

based ceramics and glasses. However, during the past few decades, new developments in the use of ceramics in more advanced technological applications have attracted considerable attention (Jones, 2013). Ceramics are defined as solid compounds that are formed by the application of heat and sometimes heat and pressure. A somewhat simpler definition was given by Kingery (2011) who defined ceramics as, the art and science of making and using solid articles, which have as their essential component, and are composed in large part of, inorganic nonmetallic materials.

Ceramics can be defined as heat resistant, non-metallic, inorganic solids that are made up of compounds formed from metallic and non-metallic elements. Ceramics are corrosion resistant, hard but brittle. Most ceramics are good insulators and withstand high temperature. They have well defined crystalline structures. The chemical bonds can be ionic or covalent depending on the chemical composition of the ceramics (Jones, 2013). Ceramics comprises at least two elements provided one of them is a non-metal or a non-metallic elemental solid. The other element(s) may be metal(s) or another non-metallic elemental solid(s). These include objects made from clay and cement that have been hardened at very high temperature. Porcelain is a hard tough ceramics that is less brittle than other ceramics. It is made from kaolin mixed with china stone and the mixture is heated to very high temperature (1300^{o}C or 2372^{o}C). Bone china has a composition similar to that of porcelain but it consists mostly of bone ash, kaolin and china stone. Bone china has very thin and translucent walls. Stoneware is densed, hard, grey or tan ceramics that is not as strong as bone china or porcelain

and so is always made thicker and heavier than bone china or porcelain to improve its strength (Jones, 2013).

The increasing use of ceramics in advanced technological applications has resulted in a heightened demand for improvements in material properties and reliability. In recent years there has been a realization that these improvements can be achieved through careful attention to the fabrication processes used for different manufacturing requirements of ceramics. There has been a remarkable growth in fundamental and applied research in the field of ceramics to meet the requirements of these advanced technological applications.

Teaching and Learning of Ceramics-Wheel Throwing Skills

In the Visual arts syllabus (as cited in Quayson, 2006 p. 127 and 128) identified Ceramics with advantages in the provision of utilitarian and decorative objects, relating to cultural and economic development in society, led to its recognition as a vocational subject. Its aims and objectives suggest that, it enables candidates to be tested on:

1. Knowledge in history and development of ceramics.
2. Ability to explore, identify, prepare and use materials, tools and equipment,
3. Create, design and develop ideas, processing and production skills, interpretation and appreciation and how to plan and establish small scale industry.

The examination will be centered on general knowledge of history and development of ceramics; use of tools and materials; production of items and

objects, their finishing and marketing. It is the expectation that candidates respond adequately to all aspects of the syllabus including essay writing, practical and multiple choice questions. Candidates, also, do a project from two practical questions and attach it with a write up on the planning, designing and preparation and appreciation.

A lot of writing regarding teaching assumes a transfer of knowledge from teacher to student, which involves lessons that can easily be tested by simply questioning the learners. For hands-on skills, the judgment has to be made by observing the learners' making and finished objects, which is not generally discussed in the literature on teaching. Hands-on skills are not easy to teach due to the struggle of describing skills and how the hands should act (Sennett, 2009). The Shannon-Weaver model of communication (as cited by Wagner, 1994) teaches us how 'interference' of understanding language can impact successful transmission of information, so we need to consider this 'interference' of understanding language/skill to enable us to overcome this struggle of describing the hands-on skills (Armitage, Donovan, Flanagan & Poma, 2011). Salmon (1995) states that it is harder to set up an experiential learning environment than an environment suited for more traditional forms of teaching. This implies that there are additional factors to consider when teaching wheel throwing skills in schools.

Payne and Taylor (2013) discuss how learning wheel throwing skills is not didactic, it is experiential, and requires hands-on touch, which is discovered by the learners and not just imparted by the teacher. Nevertheless, they go on to say

that ‘working with makers helped students learn skills faster than just being given craft tools’. Traditionally, wheel throwing skills were passed on from generation to generation, from master to apprentice, which relied on the learner imitating the master’s hand. This approach is not used as widely today, though individual potters may choose to emulate seasoned makers to help improve their own craft. McErlain (2002) also discusses how using, seeing, reading about pots and talking to others about them can be useful in learning about pots. Rogers (2008) agrees with this, stating that ‘museums, photographs, books and magazines have made the pottery of the past... accessible and immediately present to senses’ but goes on to talk about the abundance of influences and things to choose from, which makes it increasingly difficult to decide what exactly we teach to learners.

Throughout the literature there are recurring themes about the struggle of teaching wheel throwing skills; ‘established teachers may not have the time or resources to pass on their expertise’ (Whitford & Wong, 2006). Sennet (2009) discusses one of the reasons for this, when asserting that learning by demonstration ‘often works, but equally often fails. There is also the problem of language when talking about wheel throwing skills because it ‘does not submit easily to explication’ (Adamson, 2013) and the knowledge may be considered tacit. Sennet (2009) and Charney (2011) agree that there are limitations imposed by language, and that the only way around this is to be actively involved in the process of making. If a person understands how something is made but has never actually done it, there is a lack of experience that cannot be filled. This is due to the need for a ‘high degree of motor/muscle skills (kinesthetic sensitivity)’

(Risatti, 2007) to actually perform the action. This sort of situation reminds me of the times I have taught beginners. While watching and listening, they assume they understand what they are being shown until they try it with their own hands.

Risatti (2007) recommends learners to engage their focus on repetition, and Sennet (2009) agrees that going over an action gives time for self-reflection. Bayer even states 'making large numbers of pots is important' (Cameron & Lewis, 2006). Cardew (2008) compares learning a wheel throwing skills to writing, that we need to learn the skill and not worry about aiming to 'express our personality, though Gauntlett (2011) disagrees with this and notes that people should be given opportunities to express their unique personality and creativity. There are concerns that we cannot teach by language and demonstration alone, that learners have to get involved in the process and actually make something. Also, working alongside an experienced craftsperson does seem to be a significant theme throughout this aspect of the literature review.

In every teaching and learning institution, facilities, instruments, materials, equipment and manpower for instruction are very important for the effective teaching and learning process. Famwang (2003) stated that the search for aids to make teaching and learning easy and effective has been long among educators. The teacher needs to know which instructional materials and pieces of equipment are appropriate and relevant for the teaching-learning situation. Owen (2003) stated that instructional materials are educator's tools. They are used in classrooms or studios throughout the world to improve teaching and effect learning. Everything should be done to get the educational institutions to fulfill

their potentials, not by providing the schools with endless - but in the end trivial - options, but by supplying effective alternative for individual learners.

Ewule (2003) investigates the current ceramics teaching in Nigerian schools and it has been found to be unscientific, poor and not organized to produce sound knowledge ceramics teachers. This could be due to the lack of modern equipment and adequate materials in the schools for proper foundations of teaching and learning. Education would play a vital role if they are adequately equipped with equipment and materials for teaching and learning. Some of these equipment and materials according to Alasa (2005) include kilns, potter's wheels, glazes, modeling tools, clays, and so on. These he stated are inevitable aids that enhance and facilitate the teaching and production processes in ceramics. The use of equipment and materials in the Ghanaian education is however hampered by some factors. These factors according to Ewule (2003) are unavailability of basic equipment, high cost of production of the materials and exorbitant prices of available pieces of equipment.

Okewu (2014) also pointed out that many higher institutions responsible for the training of graduates in the country lack even the basic training aids such as kilns, throwing wheels and so forth. Other problems identified by Idowii (2006) include lack of fund to carry out necessary research especially in higher institutions of learning of which he advised the government at various levels to make enough funds available to carry out the necessary research that can lead the advancement of the profession. Training of Teachers (minimum) seems to be underrated and students do not appear to be adequately sponsored. Most students

offer the course as a stepping stone to other professions such as Banking, Law, etc. Lack of Resource Centers where research materials laboratory for research and research pieces of equipment such as high temperature kiln are available is yet another challenge. Ajayi and Chindo (2005) also identified the shortfall in skilled manpower and modern technology, research and development as well as inadequate and reliable ceramics infrastructure. According to them the present curricula operated in ceramics training institutions in the country are too shallow, narrow and lack contents for the development for ceramics technology. This to them is a misnomer and portrays the course more of art and design, which is meant to beautify the physical environment.

They concluded that this has made educationist and policy makers in education to see and misconstrue ceramics as nothing different from the art of beautifying the physical environment whereas Chaffers (2005) and Arayela (2006) pointed out that pottery/ceramics is the mother of all art. The development of pottery/ceramics was a milestone in human history. According to Ahuwan (2003) Ghana that aspires to industrialization is over-burdened by the paradox, where they adore ceramics ware on their walls, toilets, roofs and tables but do not appreciate their child studying ceramics in Universities, Polytechnics or Colleges of Education.

Techniques of wheel throwing skills in Ceramics

There are many techniques in use for wheel throwing ceramics containers, the basic techniques are classified into four (4) stages, namely; centering, opening, pulling and shaping. Although this is a typical procedure; A round,

moist lumpy clump of clay body is thrown at a wheel head or a bat attached to it. The term "bat" refers to a secondary disc or square, made of wood - or more recently plastic - to which the lump of clay is attached instead of the wheel head, thereby permitting the finished piece to be more easily lifted from the wheel. The lump or clump is made even and forced to the centre of the wheel by applying pressure with the hands. The thrower finds the centre of the clay by moving a thumb across the lump until no more friction is felt. The thumb is pressed into the centre of the lump, stopping about 5 mm from the wheel head. The hole thus made is widened. The sides thus defined are pulled up and made thinner by pressure between the hands. The vessel is shaped, and the mouth is smoothed. The vessel is cut from the wheel head (or bat) with a cutting wire and exposed to a conducive environment to stiffen. Sometimes the stiffened vessel is inverted on the wheel and trimmed with a sharp turning tool (Chavarria, 1994).

A skilled potter can quickly throw a vessel form 15 kg of clay (Hamer & Hamer, 2013). Alternatively, by throwing and adding coils of clay then throwing again, pots up to four feet high may be made, the heat of a blow lamp is used to firm each thrown portion before adding the next coil. In Ghana, manufacturing very large pots are made by two throwers working simultaneously (Johnson, 2006).

The techniques of jiggering and jollying can be seen as extensions of the potter’s wheel. In jiggering, a shaped tool is slowly brought down onto the plastic clay body that has been placed on top of the rotating plaster mould. The jigger tool shapes one face, the mould the other. The term is specific to the shaping of

flat ware, such as plates, whilst a similar technique, jollying, refers to the production of hollow ware such as cups (Barley, 2004).

Importance of Teaching Ceramics in Schools

Ceramics materials are very important in today's society. Tiles join other construction materials to embellish our towns and cities (Ali, 2004). Brick is the only building product that will not bum, melt, peel, warp, dent, rot, rust or be eaten by termites. Tiles are used in applications such as flooring, walls, countertops, and fire places. The electronics industry would not exist without ceramics because ceramics are excellent insulators, semi-conductors and magnets (Opoku, 2006 and Arayela, 2006). Ceramics can also be used as a form of artistic or cultural expression/heritage. Bakinde, (2006) and Ada, (2006) affirmed the role of ceramics in vocational enterprises and career development, cultural development and promotion, socio-cultural, economic empowerment and capacity building, and its contribution to industrial and technological development and promotion in Nigeria. Alkali (2009) stated that ceramics industry has played a tremendous role in the development of mankind by producing useful ceramics products, like table wares, electrical insulators roof tiles, clay pipes and so on.

Basic Ceramics Equipment/Tools

Alasa (2005) stated that ceramics tools and equipment are inevitable aids that enhance and facilitate the production processes in ceramics. Norton (1956) stated that the pieces of equipment are; scales, screens, magnetic separators filters, ball mills, pug mills, wet pans, wedging table and storage facilities. Others are; bowls, bench, tools, potter's wheel, jigger, dryers, spray gun, spray booth, kilns

and kiln furniture. Nelson (1978) stated that studio equipment are as follows; ceramics kilns, potter's wheel, clay mixers, slab rollers and extruder and glade room equipment. Other equipment stated are; scales, banding wheels, craft tool kit of common pottery tools and so forth. Alasa (2005) listed some basic ceramics equipment as follows; Clay mixers, dryers, kiln, ballmill, porcelain mortar and spray booth, throwing wheel, ware rack, temple beam balance, spring balance, standard pyrometer, bowls/buckets and spraying gun.

Hogan (1973) stated that as a starter, the standard equipment below will be used from the start to the finish of a piece. The tools are: rolling pins, calipers, brushes, needle or pricker, wire cutter, ribs, scraper, sponges, modeling tools, bats, banding wheels, wedging table or board, paddles, pot lifters, chuck and ruler. She also pointed out there are miscellaneous equipment including those listed below: Plastic bags, wooden sticks, sheets of wood and atomizers kitchen pads. Also they could use them during their practical lessons because these equipment have their functions in ceramics teaching and learning. Hogan (1973) did not include kiln in her list which is one of the most important equipment in ceramics.

Potter's Wheel

The potter's wheel has been in existence for a long time ago without an exact date. Cardew (2000) made blunt conclusion that nobody knows exactly when the potter's wheel was first invented. Interestingly, the development of the potter's wheel has made a tremendous impact in development of the art (or craft) of pottery all over the world. Technology develops in stages and accordingly with the traditions or cultures of the people concerned. The people or potters concerned

prefer what perfectly worked for them. The development proceeded along different technical and innovative lines in different regions of the world. Onuzulike (2009) stated that the earliest methods of building pots were pinching and coiling and that ancient people soon realized out of necessity, the convenience afforded by the use of a revolving base. He continued that this innovation helped them to produce pots much more easily without the usual stress of walking round and round them during the forming process.

Leach (2006) supported the observation that early potters began to develop the potter's wheel we know today from a crude revolving base. This early device was essentially a flat disk, initially without any rigid spindle, and was rotated with the hand. Onuzulike (2009) stated that all pottery traditions of the world used this "crude" revolving device. I.each (2006) hinted that the potter's wheel is known to have existed in Egypt from the commencement of recorded history and in China and Europe dating back to at least 200B.C. Norton (2006) suggested that the potter’s wheel probably originated in the near East about the year 3000BC, but it took over a thousand of years for its use to spread to Egypt, China and adjacent areas. Kenny (2006) opined that the potter's wheel existed 4000 years ago in Egypt. Interestingly development of the potter’s wheel has made a tremendous impact on the development of the art (or craft) of pottery all over the world. The potters concerned prefer what perfectly worked for them. The development proceeded along different technical and innovative lines in different regions of the world. The regions are stated in stages of probabilities at its origin as noted by Onuzulike (2009): The Malayan potter's Disk or Turn table, The Egyptian Hand-

turned, and Leg-driven wheels, the Vietnamese potter's Hand-wheel, the Indian wheel, Chinese wheel driven by foot, and by hand, the potter's wheel, Russian Hand driven potter's wheel, English potter's wheel Hand-driven by a potter's Assistant, The Japanese wheel and the German kick wheel respectively.

In the modern development of potter's wheel, Onuzuike (2009) has stated that the modern potter's wheels are not much different from the old (18th century) potter's wheels. He mentioned that two main types existed, often differentiated by the source of power. He stated that kick wheel is rotated by foot power. Onuzulike (2009) stated that the modern potter's wheel driven by foot consists of vertical iron spindle with a small disk mounted on the top end (the wheel head). The disk is usually made of iron, but sometimes of wood or plastic. On the lower part of the spindle is a large, heavy fly wheel made of wood or iron. The fly wheel provides the momentum and the potter keeps it in motion by kicking forward to the left. The spindle rotates in two sockets; one operates under the wheel head, screwed to wooden table. The other is fixed to the ground and the lower end of the spindle fits into it (Rada, 2004). Seat has been attached to this type of potter's wheel.

In addition to Rada (2004) description of the wheel, this type of wheel is relatively cheaper and is simple for the learners especially as beginners (students of colleges of Education) should start with this type of wheel. It can interest the students to retain the practice after their course is ended in the colleges to continue with the profession. The electric or the power wheels as stated by Onuzulike (2009), eliminates the use of manual power to drive the wheel head.

Instead, an electric motor is used to either drive the wheel head or flywheel directly, or the shaft, which turns the wheel head. The speed is controlled through a hand or foot lever. From the era of the recorded history up to the modern times, wheel throwing as a skill on all types of the potter's wheels has remained central to the work of artist potters all over the world.

According to Onu (2006) potter's wheel is not only one of the testicles that constitute the potency of pottery but one of the central pillars that suspend its beams. Onuzulike (2009) described the potter's wheel as a revolving mechanical device, with a flat disc-like platform mounted on a rotating shaft or spindle, which facilitates the work of a potter in the Grafting of hollow, symmetrical forms in clay. There are many types of wheels available, basically they fall into two categories: kick wheels (those powered by the potter's feet) and electrically driven wheels. Each has its advantages and disadvantages. Hogan (1973) stated that the potter's wheel is one of the basic equipment required by the potter for more and stress-less production though, it is costly obtained. The various types of wheel are:

1. The Standing kick wheel
2. Seated kick wheel
3. Electric wheel.

Learning on the kick wheel enables one to become familiar with the wheel throwing processes by having to use the whole body. At the same time, one develops hand-foot coordination. Kick wheels are quieter and generally less expensive than electric wheels of comparable quality. Electric wheel is usually

smaller and lighter than a kick wheel. You can learn more quickly on it because, not having to worry about keeping the wheel turning with your foot, you can give full attention to your hand movements. And, since much of the work is done by the wheel, the potter can channel more energy into making pots. Electric wheels are a boom to the production potter who must turn out many pieces quickly.

1. **The Standing kick wheel:** The 36kg (801b) flywheel is positioned immediately beneath the working tray where it is completely encased for maximum safety. In addition, adjustable antiskid feet have been incorporated at the base of each leg to aid levelling or marginally alter the height of the wheel head from the floor. A front mounted treadle that can be operated with foot, self-aligning ball bearings, which ensure smooth, silent running with the minimum of maintenance. Carrying handles fitted to the sturdy steel framework on other side of the working tray, make this an easy wheel to move (Potters, 1990). This type of wheel is affordable and can be maintained at lower cost but it is not very suitable for women. So when purchasing for this type of equipment there is need to be considerate.
2. **Seated kick wheel:** This wheel is fitted with a 15 diameter (38 mm) cast iron wheel head to give excellent control and free running. A large capacity one-piece plastic splash tray, complete with waste run of pipe is standard; whilst the padded upholstered seat ensures an effective and comfortable working position. The machine is ideal for beginners, School and Colleges use and for the experienced potters who may prefer to use a

kick wheel (Potters, 1990). Seated kick wheel is actually comfortable to use just as the maker indicated. In the same line with Potters (1990), it is advisable for Colleges to go for this type of wheel because even their maintenance is not much expensive as long as it is being cleaned immediately after use. It is equally good for beginners in the Colleges so that the students can learn to handle and put in their best to become professionals.

3. **Electric wheel:** Electric wheel are robust and highly polished wooden cabinet, worktop shelf, spacious rigid wheel tied with large diameter waste outlet and adjustable upholstered seat for maximum comfort. Other facilities on the wheel include splash proof electrics with overload motor protection and high-powered drive with accurate and sensitive speed control producing speeds up to 300 fps. The electric wheel is engineered for long life and low maintenance with a long working load capacity of up to 23kg (501b), (Rye & Evans, 1990). Electric wheels are generally faster in production and reduce physical stress. But electric wheels can also delay work when there is electric power cut-off, especially in nations where there is no guarantee of electricity. The Super 70 mark is another type of electric wheel. It has a tough metal case with strong plastic wheel tray making it a good workhorse for both students and professional potters. The foot speed controller can be converted to hand control with minimum adjustment. The powerful motor provides speed throughout the range. Adjustable footrests allow the potter to stand astride the wheel

whilst throwing tall pots. The seat is also adjustable. The wheel needs little maintenance or servicing and is designed to have a long working life (Potters, 1990). This type of wheel though, it is electrical, there is the need to get sample for the students to have knowledge about them and even with the school or college generator, the teacher or lecturer can operate and demonstrate its usage to the student. This will motivate the young students that are eager to join the beautiful all round ceramics education as professionals

In Ghana, these types of equipment are necessary for the teachers to demonstrate their lessons and for the students to learn to handle them too. As the students come year-in year-out therefore, the senior high schools should purchase such equipment or their equivalents and should maintain them for effective teaching and learning processes.

Clay

Clay is the main raw material for ceramics production. Clay is a general term for any fine-grained earth that develops plasticity (the capacity to be moulded and shaped) when mixed with water. Plasticity of a clay sample depends on the amount of clay minerals present. Clays are often water laid soils. They vary in consistency according to grain size. Good clays have particles of 0.05 microns (0.00005mm) in diameter. Ceramics objects are mostly made with clays with particle size of one (1) micrometer or 0.000001meter or 0.00004 inches.

The main clays in Ghana are kaolin (brown or white), which are potentially useful in the ceramics industry. These are mostly widespread in terms

of occurrence and utilization. Brown clays are exploited by the local populace throughout Ghana to make pottery and other household items (Minerals Commission 1994). A research conducted by the Ghana Geological Survey Department revealed that, there are forty-six (46) known clay deposits in Ghana, which can be located in all the ten (10) regions in Ghana. It has been estimated that there are about 1,384,895,000 tons of untapped brown and kaolin clay resources in Ghana (Minerals and Mining Policies of Ghana, 2014).

Clay consists of a large number of tiny flat plates that are stacked together with a thin layer of water separating each crosslink. Alumina (Al_2O_3) and silica (SiO_2) combines with water and other elements in various proportions to form clay minerals.

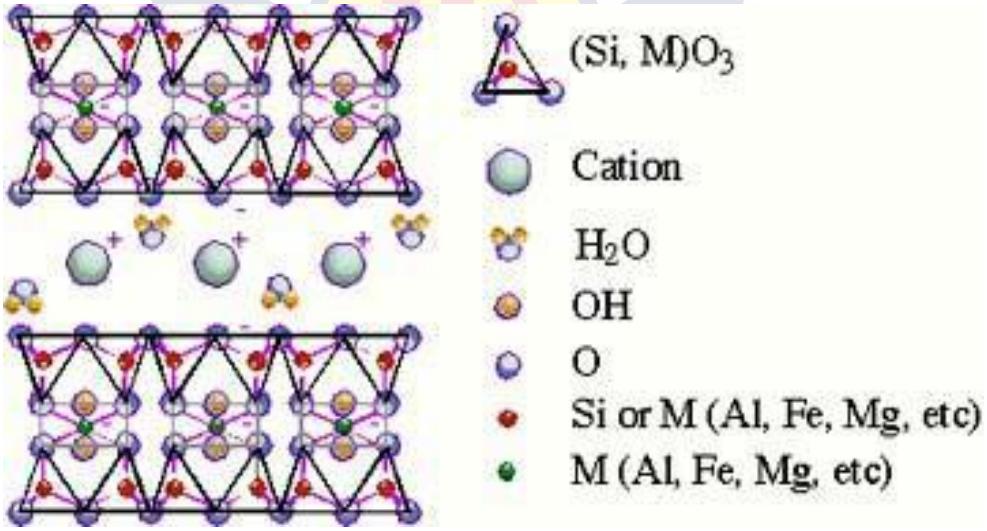

Figure 1: Basic Layered Structure of Natural Clay Mineral

Heating clay at high temperature withdraws this water resulting in the formation of bonds between the plates, holding them in place and forming a hard solid (Jones, 2013). Clay is one of the cheapest and most easily available raw

materials. The difference in the texture, colour and quality of clay depends on how it was deposited and the type of mineral it collected during its formation (Flight & Lane, 2000). Norton (2006) stated that clay is the backbone of the ceramics arts and that it has excellent workability when it is mixed with water. He further stated that clay is made up of tiny crystals that they cannot be seen under the highest power of an ordinary microscope.

Green (2003) described clay as the end product of destroyed feldspar that the earth uses to contain through chemical action in form of acid bearing rain (weathering). He also noted that clay formed by this action usually lies near or on top of the granite and are known as kaolin. Singer and Singer (2001) referred to the term “Clay” as applied to those natural earthly deposits which possess the singular property of plasticity. According to Hogan (2003) clay is the result of the decomposition or erosion of the earth's rocky crust into minute particles of varying size. Counts (2004) defined clay as the end result of a long geological process. Alasa (2005) defined clay as the product of geological weathering of the earth's surface. Stephen (2005) defined clay as being made up of tiny crystals, which cannot be seen with naked eyes. It is the oldest ceramics raw materials and is among the most plentiful earth material to be found anywhere. Gukas and Datiri (2001) define clay as an earthy malleable substance. According to Nelson (2008), Clay is defined as the very common but unique materials that make ceramics possible.

Clay types - Primary Clays and Secondary Clays

Clay falls into one of two broad categories: residual or primary clays and sedimentary or secondary clays. The most common forms of clay are kaolin, ball clays, fire clays, stoneware clays, earthenware, porcelain, and so on. Primary clays are white or light coloured and are not eroded by movement through water. They are non-plastic and unstained by other minerals. Kaolin or china clay is the most well-known and widely used of all clays. Kaolin is mostly used in clay bodies to contribute to its whiteness. Kaolin, a non - metallic material was discovered in China about 200 BC and has been widely used in ceramics industries.

However, with the exploitation and increased utilization of kaolin resources, high quality kaolin had reduced increasingly; the newly built kaolin material base cannot meet the requirements of high - quality products. One of the poor quality kaolin used in the ceramics production is known as muscovite – type kaolin which turns red on high firing temperature due to the presence of Fe_2O_3 (haematite) (Yu et al., 2010). It is often mixed with other clays to improve its plasticity and lowers its maturing temperature in the kiln (Flight & Lane, 1990). The largest deposits of kaolin in New Zealand have been formed by hydrothermal alteration of volcanic rocks. Halloysite is known to be the world's whitest clay and one of the main clay mineral deposits of Matauri bay in north land New Zealand. Chemically hallo site is similar to kaolinite ($Al_2Si_2O_5(OH)_4$) except it has four molecules of water instead of two. Around 15000 metric tonnes of kaolin are mined in New Zealand each year.

Secondary clays are transported by water or wind from the parent rocks. They have a fine particle size which gives them their plasticity. They are usually contaminated by iron oxide which makes the body of the ceramics made from such clays brown, yellow, gray and red in colour. Ball clay is regarded as one of the finest secondary clays. Ball clays are usually more plastic and have greater shrinkage. These clays can range in colour anywhere from a light tan to a dark reddish-brown after firings. It is clay which withstands very high temperature and is usually mixed with kaolin. It is used as a white slip for coating compatible dark bodies. Common clays and fire clays are also secondary clays which are used for building purposes such as the manufacture of fire bricks, furnaces and crucibles (Flight & Lane, 1990).

Fireclays can be either plastic or coarse and unworkable. Their characteristics vary except that all fire clays are extremely refractory or high firing (to about 2700^0C) and are used to make firebricks, to line kilns, fireplaces, for kiln shelves and posts. The presence of some iron in fireclays imparts a cream to tan colour to the fired clay. Stoneware clays as clay is very popular with potters vary in their plasticity and in drying and firing characteristics. They can be used alone if these characteristics combine into a workable material. More often, stoneware is a blend of natural clays, plus other ingredients added to obtain a desired degree of plasticity, colour, and maturing temperature. These clays are high firing, maturing between about 2200^0C and 2300^0C, and range from light tans to darker browns and grey when fired. Because they become hard and vitrified when fired, they do not need to be glazed to hold water. Earthenware clay

is either single natural clay or a mixture of several clays that fires to a relatively low temperature (1700^0C to 2100^0C) because of impurities (fluxes) that lower its melting point.

The fired body is only partially vitrified and therefore remains porous, is subject to chipping and will not hold water without being glazed. Fired earthenware ranges in colour from white to buff and light tans, pinks, reds, and browns. Porcelain is compounded clay composed of white burning clays, Kaolin, and ball clay, along with fluxes and silica. Porcelain is very high firing clay (between 2500^0C and 2700^0C). When fired it becomes white, translucent, very hard, and vitreous. Its low plasticity makes porcelain difficult to work with. Several researchers Alasa (2005), (Hogan, 2003; Nelson, 2008), Gukas and Datiri (2001) agree with this observation. Bentonite is usually added to the kaolin clay to improve its strenght. It is extremely plastic and the unbearable high shrinkage rate of bentonite makes it difficult to be worked alone. It can withstand a temperature of about 1750°C. According to Umar (2003), nearly all clays contain some impurities, with the reason why processing of clay before working is important.

Sources of Clay

According to Aluwong (2009), clay materials abound at most construction localities. The garden clay pits and construction sites may yield us variety of clay materials. Some knowledge of the local geology or consultation with geology teachers, also local potters can be sources of valuable information. Norton (2005) stated that clays are found nearly everywhere on the earth's habitable surface. He continued that clay is a secondary product in the earth's crust; it resulted from

decomposition by weathering of the older rocks of the feldspar type. Counts (2004) stated that we get clay when a granite-type rock is broken down and decomposed into fine particles. When water is added to these particles, they become plastic and can be forced into shapes. Gukas and Datiri (2001) noted that clay is formed as a result of the decomposition of an igneous rock. That clays vary according to their location, that is where the clay is found in site (place of formation), or it is a resettled clay. In Ghana, Opoku (2006) noted that clay occurs naturally almost everywhere in the world and is formed by the action of weathering on several kinds of rocks. Horgan (2003) stated that granite type feldspatic rocks are the source of all clays.

Mode and Amobi (2006) stated that they (clays) all originated from process of instability in other silicate minerals. The genesis of clay involves the dissolution of a given mineral or group of minerals, which produces a solution of a different aggregate solute composition from that of each of the reacting solids.

High firing porcelain clay bodies include primary clays in their composition. Other clays are moved from their origin, usually by water, also by wind or even glacial action. When they finally come to rest, these sedimentary or secondary clays are finely grained because of the grinding action of moving rivers and streams on the clay particles and because heavier particles have already settled out at earlier stages of the journey. Therefore, they are more plastic than primary clays. Sedimentary clays have undergone change on their journey, mixing with other materials as they are transported.

Importance of Clay in Teaching Ceramics-Wheel Throwing Skills

Olorukooba (2001) stated that the medium clay is one of the oldest art materials used by man. It has been shaped into the most primitive utensils (cups, mugs, pots, etc. produced by wheel throwing skills) serves as an essential ingredient in the production of ceramics. He continued that the possible reasons for the universal practice of this art could be due to the availability of clay in all parts of the world. Clay does not need an elaborate preparation. Kparevzua (2004) observed that clay is a traditional medium that it is valuable for producing hand crafted forms like bricks, kitchen-wares, household decorations, toys and so on. Clay is a material which is cheap, widely available and by comparison with stone relatively light. Manzuche (as cited in Kashim, 2011) states that clay is characterized as soft, plain, and plastic. It can be bent, molded, pounded, pinched, flattened, rolled coiled, thrown on a wheel, and cast into mold to produce functional and aesthetic objects. It responds to shape, bending smoothing, drying, glazing and firing.

Golomb (2004) suggests the importance of clay as an art material. Clay can to be formed in the round; attention can be given to all sides of the object being sculpted. It is different from drawing a two-dimensional surface that can only create the illusion of space, depth, and form and can never reproduce the world in a direct way. Golomb (2004) conducted two studies, one with 300 hundred students, and the other with 109, in which participants were asked to create a sculptural representation of figures. She evaluated them based on posture, attention to multiple sides, and the manner the material was used. She discovered

a difference in child development between the two dimensional drawings and three-dimensional sculptures. One specific example states, “Compare with the drawn human figure, the trend in modeling is toward an earlier differentiation of the trunk as a separate structure.

Golomb suggests that the conceptual development in working with clay is different from that of two-dimensional media (Golomb 2002; DeMuro, 2002). Warchowiak and Clements (2001), support Golomb by dedicating a chapter to the importance and use of clay in the art classroom. Ash (2000) suggests that sculpture is a neglected discipline and supports the use of clay because of its unique ability to activate the senses in a way that two-dimensional work cannot. He encourages the active participation of the viewer and creator of three-dimensional work. Teachers and researchers advocate the use of clay for many different reasons ranging from sensory learning to developing cognitive and affective skills for learning.

Meng (2002) and Hack (2009) have found that their students are enthusiastic, eager, and enjoy learning when working with clay. Walkup (2005) supports it for the enjoyment of the teacher and student, and Warick (2005) for the scientific knowledge that can be gained. Similansky, Hagan, and Lewis (2008) conducted a field-based research project with 1,600 children using clay in the classroom. The results support the notion that clay can promote the development of learning skills and allows for a different type of representation than drawing offers, their book provides everything from teaching strategies to managing clay in the classroom. In conclusion, Hill (2008) argues that historical evidence does

support the value of clay as a medium for expression but that further research is needed to support its use in the classroom. Hill suggests, "Reviving the progressive argument for handwork in clay modeling could provide what is needed" (p. 189). Owing to these fundamental characteristics, clay has been singled out to be the most important element in the whole world, which serves as a means of technological development ever since the early man in the eras of man's creation. Through ceramics making, as it gave them access to how other people manipulated clay, enabling them to realize some of the errors in their production.

In this regard clay should be made available for the students of schools/colleges of education in Ghana for better practice of teaching and learning process gearing toward perfection in the profession.

Using Educational Video to Teach Wheel Throwing Skills in Ceramics

Using audio-visual materials in the classroom is nothing new. Educators have recognized the power of audio-visual materials to capture the attention of learners, increase their motivation and enhance their learning experience. The use of educational video and television in classrooms has risen steadily over the past 20 to 30 years, according to a series of studies conducted by the Corporation for Public Broadcasting (CPB, 2004). These surveys measured both patterns of use and teacher attitudes and expectations for outcomes. Not only is this technology widely used, according to the most recent study, but it is also highly valued as a means of teaching more effectively and creatively (CPB, 2007).

Perhaps the most significant survey finding that supports the value of these multimedia tools is the direct relationship between frequency of use and perceived student achievement and motivation. Among frequent users (teachers who report using TV or video for two or more hours per week), two-thirds find that students learn more when TV or video is used, and close to 70% find that student motivation increases. More than half of frequent users also find that students use new vocabulary as a result of video use.

According to a summary of current research and educator surveys, educational television and video:

1. Reinforces reading and lecture material
2. Aids in the development of a common base of knowledge among students
3. Enhances student comprehension and discussion
4. Provides greater accommodation of diverse learning styles
5. Increases student motivation and enthusiasm
6. Promotes teacher effectiveness (CPB, 2004)

During the process of teaching and learning wheel throwing skills in ceramics class, educational video can be used by teachers to enhance the students' skills. Students are able to see and watch. Seeing is the process of looking at finished work, photographs, visiting museums and similar sorts of activities. Watching is more about action, observing how people make and how they manipulate clay in their own unique way. If you look at the internet now, you can learn a lot. Most teachers agreed they had watched educational videos to learn something new on wheel throwing skills using the internet (Alnæs, Blechta, Hake,

Johansson, Kehlet, Logg & Wells, 2015). Sometimes the watching focused on a small section of particular videos, which were viewed several times in order to understand something as simple as one small movement (Booton, 2015).

Educational video were created for a number of reasons. One common intention was to help teach the next generation of makers. They were also using videos to educate their customers and show them work that goes into a piece of pottery. Fitch (2015) declared he used video to show his students what he was experiencing in the landscape around him and how he uses those influences in his work. Booton (2015) admitted he initially made videos so he could watch himself and see where he was going wrong, and now uses them as a 'shop front', which allows a wider audience to see his work

The films tend to show mainly parts of the process, as well as the environment that the potters work in. This may feature the landscape or the animals that surround their studio. Most of the films are made without any narration, so it is only the visual clips that explain the work that is being produced during the day.

In order to address a variety of teaching and learning styles in ceramics (wheel throwing skills), teachers may use educational video to enhance throwing instruction. Educational video can be added to lessons by presenting classic historical information in a modern way that is more accessible to students than traditional teaching. With access to educational video sharing, internet learning channels/platforms such as YouTube, facebook etc… becomes easy for teachers to find educational video that have positive impacts on the acquisition of

information for all students in ceramics lesson. The availability of viewing videos similar internet sites, offers every expanding opportunity for learning and engagement that have never before existed.

Bull and Bell (2010) state that, digital videos have now become a common feature of commercial, religious, political, and government contexts, as well as social interactions. In order for a Ghanaian school to remain relevant to its increasing tech savvy students and to the 21st century workforce, educators must also consider if and when digital educational videos should be adapted into their ceramics lesson plans for everyday classroom use. Watching educational videos within the classroom facilitates knowledge building in wheel throwing skills, which allows students to acquire a better grasp of the concepts and add to their understanding in ways that go past traditional teaching methods. A short educational video on wheel throwing skills can be combined with a background document in order to quickly provide information, develop an instructional process, or an illustration of student engagement in a manner that would be difficult to achieve in other ways.

Educators can easily use educational videos as a way to communicate wheel throwing skill information with their students because students today engage in watching video clips on digital media during their spare time. Students today have a hard time grasping the idea that videos used to be played on VHS tape formats or music used to be played on cassette tapes (Bull & Bell 2010). Millions of students across Ghana benefit fully from a traditional educational program because they have the ability to participate in a general education setting.

Many research studies have shown that using video based instruction can have positive impact on the students' learning of wheel throwing skills in ceramics education.

How Educational Video Promotes Wheel Throwing Skill Learning

There is a pervasive belief, increasingly being challenged by research, that television and video viewing is a passive activity in which viewers are only superficially reactive to what they are watching, and one that will, over time, hamper or displace academic achievement. However, recent studies support the theory that viewing is instead an active process, one which can be "an ongoing and highly interconnected process of monitoring and comprehending" and "a complex, cognitive activity that develops and matures with the child's development to promote learning" (Marshall, 2002, p. 7). Mayer (2001) explains that viewing, while it may appear to be passive, can involve the high cognitive activity necessary for active learning; "well-designed multimedia instructional messages can promote active cognitive processing in students, even when learners seem to be behaviorally inactive" (p. 19). The content and context of the viewing are both crucial elements for engaging students as active learners. Content should be age- and skill-appropriate, as "the content one watches may be a truer determinant of future academic success than the amount of time one spends watching television" Stanovitch and Cunningham, (as cited in CPB, 2004, p. 8). Other aspects of video that have been demonstrated to engage students in active learning are its address to multiple forms of intelligence, its use of multiple modes for content delivery and its emotional appeal to viewers.

The Benefits of Using Technology in the Classroom

Nebel (2016) and Denning (2014) summarizes the benefits of educational video to a range of special student populations: educational video may help to promote learning in students with high visual orientation in their learning styles. Educational video can also provide visually-compelling access to information for many learners with learning difficulties who might miss learning opportunities provided solely by print-based materials. In this respect, videos provide important learning opportunities to students working in a second language. (p.2) As Barron (1989) argues, not only can educational video create learning contexts that would not otherwise be accessible, "in some situations video is even superior to a field trip … because the video can be replayed and reviewed as often as necessary" to ensure learning by students with learning disabilities or who are otherwise at-risk for poor school success (p. 3)

Technology in the classroom enables the use of more interactive educational tools, which allows for a dynamic learning experience that directly benefits students. Web 2.0 interaction involves not only sharing ideas and information with someone else but also receiving feedback. As classroom computer technology is being used for different types of communication (for presentation, for class interaction, and for collaboration), students are required to be readers, writers, editors, and publishers and must be willing to collaborate and co-create closely with others - all skills that are critical for students to learn as they grow and enter the workplace.

Another advantage of using technology in the classroom is its flexibility and adaptability to differentiated learning. Technologies provide students with the opportunity to learn at their own pace and the freedom to go back and relearn content whenever they want. This could be especially important for students and students with learning disabilities: Many students need additional support with pronunciation and defining common vocabulary that may be new to them. Other students might have difficulty reading and reviewing complex texts. The ability to access educational video in teaching wheel throwing skill can help address these students' needs. Using technology in the classroom, therefore, can help combat the "lecture style" system of education, which does cater to a variety of learning processes.

Empirical Review

Challenges of Infusing Technology in Visual arts Education in Ghana

Siaw and Nortey (2011) conducted a study on teaching and learning of visual arts in senior high schools in Ghana. The study employed both qualitative and quantitative research methods to compare teaching and learning processes to clarify differences in students' academic performance gap in Visual arts in urban, peri-urban and rural Senior High Schools in the Ashanti Region of Ghana. The purposive and simple random sampling techniques were used to sample six schools – two in each setting, comprising 120 students and 18 teachers. The study revealed that there was lack of logistics in terms of art studio, working tables and funding for practical works during the academic term in almost all the sampled schools. The study found that all the teachers in the selected schools use the

classroom method of teaching. However, James (1996) found that technical demonstration by teachers teaches students the nature of creative art and helps students go beyond school learning. Siaw and Nortey (2011) assume that the method of teaching practical work as a theory lesson by teachers does not fulfill the rationale for the Visual arts programme which is to equip the student with the necessary creative skills and acquire competency.

Similarly, Kassah and Kemevor (2016) assessed the challenges of visual arts education in Ghana's colleges of education. The focus of the study was to find out the rationale, scope, structure and the challenges of visual arts education in Colleges of Education in Ghana. The qualitative research approach with questionnaire, Interview guide and observation list were the instruments used. Simple random sampling procedure was used to select five colleges of education in the Volta Region of Ghana namely; St. Francis College of Education, St. Theresa College of Education, Akatsi College of Education, Peki College of Education, and Jasikan College of Education. The study revealed that Visual arts education in Colleges of Education faces numerous challenges. The problems ranging from low patronage of the programme, lack of studios, and training tools and materials, inadequate quality Visual arts lecturers or facilitators, negative perceptions towards Visual arts education.

Lartey (2009) assessed different strategies to fostering creativity in visual arts in Senior High School in selected districts in the Eastern Region. The study revealed that two hundred and thirteen (59%) said their schools do not have Visual arts studios. 48 % of the respondents said they had not got access to art

materials in respect of tools and equipment which would have led to processes of production as the basis for artistic growth.

Similarly, Opoku-Asare, Agbenatoe, and DeGraft-Johnson (2014) conducted a study on instructional strategies, institutional support and student achievement in General Knowledge in Art; Implications for visual arts education in Ghana. The study employed both qualitative and quantitative research approaches. The data collecting instruments used were interview guide, questionnaire and classroom observation list. The purposive sampling technique was used to select four Senior High Schools where General Knowledge in Art (GKA) is offered by Visual arts (VA) and Home Economics (HE) students in one district of Ashanti Region, Ghana. The findings of the study revealed that attractive facilities such as laboratories, libraries, instructional materials and art studios are major contributing factors to high academic performance. Unfortunately, the questionnaire responses confirmed that 62% of the 420 student respondents do not always have access to these facilities which were not made available to them. Relevant tools, equipment, and materials are required for executing assigned practical exercises.

The items the students mentioned include brushes, shading pencils and lettering pens; materials such as poster colours, drawing paper, skin and leather; equipment and facilities such as sewing machines, exhibition halls, working studios and kilns for firing clay were lacking. This suggests that General Knowledge in Art students in the sampled schools are not being exposed to the knowledge of conventional tools and materials needed for contemporary art

production. The school libraries were also poorly stocked with art books that the students could learn from; they had no computers and internet connectivity to source literature to supplement the learning materials they receive from their teachers. The students depend on their teachers for knowledge, the students said this makes it necessary for them to memorize the content of handouts and 'teaching notes' the teachers often dictate for them to learn. This does not empower the students to take responsibility for their academic success.

Conceptual Framework

This study was conceptualized from the perspective that the usage of educational video in the teaching and learning of wheel throwing largely depends on organizational factors such as the beliefs, feelings and thoughts of Management of the Senior High Schools towards the infusion of computer technology in teaching. Due to the capital intensive nature that goes with the provision of state of the art technology, its availability in Senior High Schools largely depends on management of the schools who take decision and control the finances of the schools. Students can only use the facilities the management is able to provide for them.

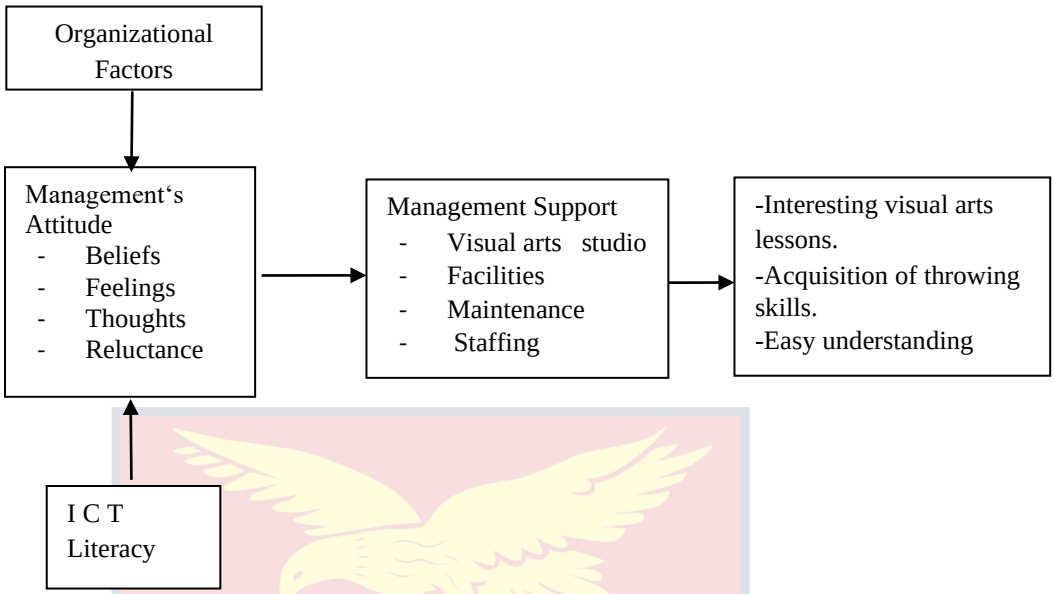

Figure 2: Conceptual Framework

Source: Adapted from Becta (2003).

The conceptual framework was adapted to show how the availability of a technology in an educational institution is linked to the belief and attitude of the management or the administrators of the institution. In the conceptual framework adopted, the availability of resources such as educational video for teaching wheel throwing in the senior high schools as the dependent variable are the belief, feeling, ICT literacy level and attitude of the administrators of the schools towards technology utilization are the independent variables that influences the availability and utilization of educational video in teaching wheel throwing in schools within the Cape Coast Metropolis. The availability of a technology in an institution is usually influenced by the support it enjoys from the managers of the institution. This is because they provide direction, take decision and control the finances of the institution. This implies that the availability of resources such as educational video for teaching wheel throwing in the senior high schools within

the Cape Coast Metropolis is dependent on the beliefs, feeling, and attitude of the management of the schools towards the utilization of technological facilities in teaching.

CHAPTER THREE

RESEARCH METHODS

Introduction

This chapter focused on the methods followed in conducting the study. It discusses the research design, the population, the sample and the method of sample selection. It also describes the research instruments used, the procedure followed in collecting the data and data analysis plan.

Research Design

The research design that was used for the study was the descriptive research design, with survey as it forms. According to Babbie (2005), the main purpose of descriptive research is to describe and document situations and events. Descriptive research in the form of survey was suitable for this study because it helped the researcher to describe the effect of educational video on student's wheel throwing skills in the Senior High Schools of Cape Coast Metropolis. Again, the population for this study was quite large (all third year students currently pursuing Ceramics as elective subject in their Visual arts programme in Senior High Schools (SHS) of Cape Coast Metropolis) hence there was the need for a design that can be used for large populations. According to Babbie (2005) surveys are particularly useful in describing the characteristics of a large population hence among all research designs, the descriptive research design was most appropriate for this study.

Surveys allow the researcher to ask many questions on a given topic giving the researcher a considerable flexibility in analyzing the data. Whereas

experimental design may require the researcher to commit him or herself in advance to a particular operational definition of a concept, surveys permit the researcher to develop operational definitions from actual observations (Babbie 2005).

On the other hand, because of the characteristics of non-response associated with the use of questionnaires, each questionnaire not returned is likely to affect the representativeness of the sample resulting in a biased final sample. Data collection error may occur due to the researcher wanting to record only what he/she wants to hear and ignore the data that does not conform to the research hypothesis. The respondents sometimes feel reluctant to express themselves because they might not be sure of confidentiality of information provided. However, measures were put in place to reduce the occurrence of such incidence.

Population

The total population comprised 378 third year SHS Visual arts students and Teachers. The researcher collected the number of the third year SHS students (both males and females) from heads of department in the various schools of Cape Coast Metropolis.

Sample and Sampling Procedure

The quota sampling and the simple random sampling techniques were used for the study. The sample size for the study was 126. Krejcie and Morgan (1970) maintain that a minimum sample size of 160 is recommended for a study population of 500. The total population for this study was 378 hence the sample size of 126 was representative base on Krejcie and Morgan (1970) table of sample

size selection. Furthermore, according to Nsowah-Nuamah (2005) in using the proportionate stratified sampling technique to select from the strata, the researcher on his own can select the sample fraction that will be used based on the number of respondents available in strata. The sample fraction for this study was 1/3 and was used to select the quota from the various schools involved in the study. The table below provides detail information about the sample size from participating schools.

Table 1: Distribution of Teachers and Students from Their Respective Schools

Schools	Population	Male Sample	Female Sample	Total Sample
Adisadel College	Students	20	-	22
	Teachers	1	1	
Mfantsipm SHS	Students	36	-	38
	Teachers	2	-	
Ghana National College	Students	20	19	41
	Teachers	2	-	
Oguaa Senior-	Students	5	5	12
Technical School	Teachers	1	1	
University Practice	Students	7	3	13
SHS	Teachers	1	2	
Total		63	63	126

According to Table 1, 22 students and teachers were selected from Adisadel College, 38 from Mfantsipim SHS, 41 from Ghana National College, 12 from Oguaa-Senior technical and 13 from University practice SHS.

Data Collection Instrument

Data needed for this study were obtained using questionnaires. The use of questionnaire in collecting data in a descriptive research design has some strength over other instruments such as observation. The major ones are enumerated as follows; firstly, the use of the questionnaire saves time and cost. Expenses involved in training observers and the time involved in making observations are reduced when one uses the questionnaire. In addition, there is uniformity in questions. Thus each respondent receives the same set of questions printed in exactly the same way. Questionnaires are therefore likely to yield more comparable data than observation.

Finally, the use of questionnaires offers a high level of reachability. The questionnaire can be sent almost everywhere provided an efficient postal service is in place, a condition that is usually impractical for observation.

Notwithstanding these advantages, the use of the questionnaire also has the following disadvantages; it is mostly limited to literate population. This is because it requires the respondent to read the items and provide appropriate responses in a written form. It comes with many challenges using the questionnaire to collect data in developing countries with high illiteracy rate. Furthermore, because of the characteristics of non-response associated with the use of questionnaires, each questionnaire not returned is likely to affect the

representativeness of the sample resulting in a biased final sample. To reduce this effect, the researcher selected a sample size that exceeded the minimum required sample size as Krejcie and Morgan (1970) postulates. This was to cater for any shortfall that may arise as a result of a questionnaire that may not be returned. Lastly, the motivation of the respondent to complete the items is difficult to ascertain since the questionnaire usually is completed in the absence of the researcher.

The items in the questionnaire were derived from the literature reviewed. Two sets of questionnaires were designed for the SHS Visual arts students and teachers. Each questionnaire was sub divided into Sections (A to F). Each questionnaire contains an introductory statement that spells out the purpose for the questionnaire, a guide to answering the items on the questionnaire and also assuring respondents of anonymity and confidentiality. Section "A", contained items that elicited demographic data of the respondents. Section "B", contained items that sought information regarding general knowledge on ICT and throwing. Items. Section "C" sought information regarding both teachers and students perception towards throwing skills. Section "D" focused on questions on availability of resources for teaching and learning wheel throwing skills. Section "E" focused on questions on relevance of scenes from the video "wheel throwing skills demonstration" which in turn became the intervention for the problem under study. Finally, items in Section "F" focused on items regarding challenges facing teaching and learning of wheel throwing skills in ceramics education. Most of the

items were closed-ended. The total number of questions contained in the questionnaire was thirty three (33).

Items on section C sought information regarding hypothesis one (HO 1) and Hypothesis two (HO 2), whiles section D sought information about hypothesis three (HO 3). Section E dealt with hypothesis four (HO 4) which formed the umbrella of the study and section F was also meant to collect information about the views of teachers and students on factors affecting teaching and learning of wheel throwing skills in ceramics education.

Most of the items were closed-ended. The Likert scale was provided to solicit responses from the respondents based on the degree with which they agree or disagree. The Likert scale has the following scores;

Scoring system	Marks
Strongly Disagree (SD),	1
Disagree (D),	2
Uncertain (U),	3
Agree (A),	4
Strongly Agree (SA).	5

Validity of Instrument

The research instruments were subjected to a validity and reliability test by an expert to ascertain how they met face and content validity. The suggestions as given by the expert were incorporated to effect the necessary changes to

improve upon the instrument. A pilot test of the instruments was then conducted. The questionnaires were administered to 60 SHS third year students in Aggrey Memorial Zion SHS and Moree SHS in the Abura Kwamankese District in the Central Region. These teachers and students comprising of 38 (males) and 22 (females) were chosen for the pilot testing because as SHS teachers and students, they were expected to have similar academic needs and characteristics in terms of the skills required in 'wheel throwing' as compared to the students in the various schools in the Cape Coast Metropolis that were involved in the actual study**.**

The stratified sampling technique was used for the pilot test. The data gathered was analyzed and the reliability test was 0.059 at alpha level. The schools that participated in the pilot testing were excluded from the main study. The pilot study further helped to revise and modify the items on the questionnaire. Thus, the questionnaire was made more specific and effective in collecting the needed data.

Data Collection Procedure

The researcher sought permission from the administrative heads of the various schools with an introductory letter from the Department of Information Technology in Education. Data collection was done by the researcher. The researcher was introduced to the staff of the various schools by the respective school heads which afforded the researcher an opportunity to explain to the staff about her intention and personally sought their permission to administer the questionnaire. Hence participation of the respondents were voluntary for all.

In order to maintain confidentiality, participants were not required to indicate their identity on the questionnaires. Instead, code numbers and code names were assigned to each questionnaire

The data collection started on the 5th of October and ended on the 17th of October, 2017. The questionnaires were administered to Visual arts teachers and students in SHS in the Cape Coast Metropolis. To avoid non-responses, respondents were given enough time to complete the questionnaire given them. There was a 98% return rate from both the students and the teachers. The only problem encountered so far was some respondents were not present in school throughout the data collection period due to personal reasons.

Data Analysis Procedure

The completed questionnaires were scored and values tabulated. The same scores were given to items with the response strongly agree, agree, disagree and strongly disagree respectively. For ease of analysis, the responses of strongly agree and agree were combined and strongly disagree and disagree were also combined. Since the study was purely descriptive, descriptive statistics was used. The main statistical tool that was used for analyzing the data was independent sample t-test.

Summary of the Chapter

This chapter focused on the use of descriptive research design. The target population was third year SHS Visual arts students and teachers in the Cape Coast Metropolis. The quota sampling and the simple random sampling techniques were used for the study and questionnaire was used to gather data from respondents. On

the collection of data, an introductory letter was obtained from the Department of Information Technology, University of Cape Coast which enabled the researchers to obtain permission from the various heads of the schools. SPSS version 23.0 was used for data analysis.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

The purpose of this study was to investigate the effect of educational video on students' wheel throwing skills in the Senior High Schools of Cape Coast Metropolis to facilitate their academic work. Two sets of questionnaires were employed to gather the requisite data for the study. The data from 126 respondents were analyzed through the computation of means and standard deviation distributions. This chapter presents the interpretations, discussions and inferences that were made from the output.

Hypothesis Testing

Hypothesis One: There is no statistical significant difference in the perception of teachers on teaching and learning wheel throwing skills in ceramics education in the Senior High Schools.

The first hypothesis sought to determine the statistical significant difference in the perception of teachers on teaching and learning wheel throwing skills in ceramics education in the Senior High Schools. The results are presented in Table 2.

Table 2: Differences in the Perception of Teachers on Teaching and Learning Wheel Throwing Skills in Ceramics Education

Variables	Mean	SD	*T*	df	*P*
Teaching	2.69	0.413	2.588	10	0.000
Learning	2.06	0.704	3.668		

Source: Field survey, Morrison (2017).

Table 2 shows the results on the differences in the perception of teachers on teaching and learning wheel throwing skills in ceramics education. Results from Table 2, indicated that there is a statistically significant difference in the perception of teachers on teaching and learning wheel throwing skills in ceramics education. This is evident as (M= 2.69; SD = 0.413) was found for perceptions of teachers in teaching wheel throwing skills in ceramics education; (M= 2.06; SD= 0.704) was found for the perception of teachers in learning wheel throwing skills in ceramics education. t (10) = 2.588 and, $p < 0.05$, (p=0.000). This means that there is difference in the perception of teachers on teaching and learning wheel throwing skills in ceramics education. Therefore, the researcher rejects the null hypothesis. Hence, the result is statistically significant.

Hypothesis Two: There is no statistical significant difference in the perception of students on teaching and learning wheel throwing skills in ceramics education in the Senior High Schools.

The second hypothesis sought to determine the statistical significant difference in the perception of students on teaching and learning wheel throwing skills in ceramics education in the Senior High Schools. The results are presented in Table 3.

Table 3: Differences in the Perception of Students on Teaching and Learning Wheel Throwing Skills in Ceramics Education

Variables	Mean	SD	*T*	df	*P*
Teaching	2.26	0.488	5.020	114	0.000
Learning	2.39	0.656	3.304		

Source: Field survey, Morrison (2017).

Table 3 shows the results on the differences in the perception of students on teaching and learning wheel throwing skills in ceramics education. Results from Table 3, indicated that there is a statistically significant difference in the perception of students on teaching and learning wheel throwing skills in ceramics education. This is observed from the results as (M= 2.26; SD = 0.488) was found for perceptions of students in teaching wheel throwing skills in ceramics education; (M = 2.39; SD = 0.656) was found for perceptions of students in learning wheel throwing skills in ceramics education; t (114) = 5.020, $p < 0.05$, (p=0.000). This means that there is difference in the perception of students on teaching and learning wheel throwing skills in ceramics education. Therefore, the researcher rejects the null hypothesis. Hence, the result is statistically significant.

Hypothesis Three: There is no statistical significant difference in the opinions of teachers and students on the availability of ceramics resources for teaching and learning wheel throwing skills in the Senior High Schools

Hypothesis three sought to determine the statistical significant difference in the opinions of teachers and students on the availability of ceramics resources for teaching and learning wheel throwing skills in the Senior High Schools. The results are presented in Table 4.

Table 4: Differences in the Opinions of Teachers and Students on the Availability of Ceramics Resources for Teaching and Learning Wheel Throwing Skills in the Senior High Schools

Respondent	Mean	SD	*T*	Df	*P*
Teachers	2.05	0.790	0.341	10	0.000
Students	3.39	0.694	0.726	114	0.000

Source: Field survey, Morrison (2017).

Table 4 shows the results on the differences in the opinions of teachers and students on the availability of ceramics resources for teaching and learning wheel throwing skills in the senior high schools. Results from Table 4, indicated that there is a statistically significant difference in the opinions of teachers and students on the availability of ceramics resources for teaching and learning wheel throwing skills in the Senior High Schools. This is observed from the results as (M= 2.05; SD = 0.790) was found for opinions of teachers on the availability of ceramics resources for teaching and learning wheel throwing skills; (M = 3.39; SD = 0.694) was found for opinions of students on the availability of ceramics resources for teaching and learning wheel throwing skills; t (10; 114) = 0.341 and 0.726, $p < 0.05$, (p=0.000). This means that there is difference in the opinions of teachers and students on the availability of ceramics resources for teaching and learning wheel throwing skills in the Senior High Schools. Therefore, the researcher rejects the null hypothesis. Hence, the result is statistically significant.

Hypothesis Four: There is no statistical significant difference in the effect of educational video on teaching and learning of wheel throwing skills in the ceramics education.

The final hypothesis sought to determine the statistical significant difference in the effect of educational video on teaching and learning of wheel throwing skills in the ceramics education. The results are presented in Table 5.

Table 5: Differences in the Effect of Educational Video on Teaching and Learning of Wheel Throwing Skills in Ceramics Education

Variables	Mean	SD	*T*	Df	*P*
Teaching	3.56	0.355	0.679	10	0.067
Learning	3.49	0.745	0.587	114	0.086

Source: Field survey, Morrison (2017).

Table 5 shows the results on the differences in the effect of educational video on teaching and learning wheel throwing skills in ceramics education. Results from Table 5, indicated that there is no statistically significant difference in the effect of educational video on teaching and learning wheel throwing skills in ceramics education. This is observed from the results as (M= 3.56; SD = 0.355) was found for teachers and students in the effect of educational video on teaching and wheel throwing skills in ceramics education; (M = 3.49; SD = 0.745) was found for teachers and students in the effect of educational video on learning wheel throwing skills in ceramics education; t (10; 114) = 0.679 and 0.587, $p > 0.05$, (p=0.067 and 0.086). This means that there is no difference in the effect of educational video on teaching and learning wheel throwing skills in ceramics

education. Therefore, the researcher fails to reject the null hypothesis. Hence, the result is not statistically significant.

Discussion of the findings and intervention

From the analysis of the data collected through questionnaire, some facts have emerged. This section of the study discusses the findings and intervention related to the use of educational video. The study showed that the nature of teaching instruction for most visual arts courses especially ceramics in Ghana is done through traditional classroom pedagogical methods such as teacher lectures, direct instruction, face to face demonstration and student note taking.

In the study, it is observed that clay which is the basic material for ceramics production is abundant in the central region, hence most senior high school in the region studying ceramics.

Using audio-visual materials in the classroom is nothing new. Educators have recognized the power of audio-visual materials to capture the attention of learners, increase their motivation and enhance their learning experience. The use of educational video and television in classrooms has risen steadily all over the world past 20 to 30 years, with Ghana not exempted. In Ghana, almost all the Central Region schools have ICT laboratories sourced with computers and its accessories, together with the necessary items that constitute the materials resources of a school including those supplementary input that support teaching and learning in schools like studio facilities, materials, tools, equipment, textbooks, technologies etc. but the findings in this study indicate that some

resources which were available are presently either inadequate or in poor conditions with some not existing any more.

It is observed again from the study that almost all the teachers in the selected schools use the traditional classroom pedagogical methods (teacher lectures, face to face demonstration and student note taking) to deliver their lesson. Teaching aids are left to teachers' resourcefulness and initiative.

This is a concern we need to address since we cannot teach by language and demonstration alone, that learners have to get involved in the process and actually make something. Hands-on skills like wheel throwing skills are not easy to teach due to the struggle of describing skills and how the hands should act.

For a skills like wheel throwing to be understood and mastered well, it need to practice in repetition till the skill is absorb into the hands and body of the person. This is best achieved when the use of modern studio facilities and educational technologies are used.

INTERVENTION

Wheel throwing skills as a craft requires retentive training. The guidance, assistance and time needed to teach this craft is not adequate, making most teachers struggle to teach this craft or avoid teaching it as well as the other related topics. Based on this reason, the researcher saw the need to devise a special teaching strategy that will go a long way to curb the difficulty of the problem and improve the situation. From the study, it is observed that educational technologies in the form of video when employed in teaching wheel throwing skills brings many benefits such as providing students with the opportunity to learn at their

own pace and have the freedom to go back and relearn the content whenever they want within a short frame of time.

Again, the ability to use educational video in teaching wheel throwing skills through ceramics making becomes easy, as it teaches students the nature of creative art which gives them access to how other people manipulated clay, enabling them to realize some of the errors in their own making process as a way widening their knowledge base on wheel throwing skills and helping address these ‘students' needs. Educational video appeals to both the senses of hearing sight and motion (Okwo & Ike, 2005). Based on these benefits, the researcher developed a ten minutes learning educational video software on wheel throwing skills which can be integrated with teaching as background lesson or leisure time learning for self-reflection that will improve the teaching and enhance learning.

In developing the educational video, the researcher made use of the content on wheel throwing skills process and added an illustration of student engagement in the demonstration (This aspect made the video setting looked natural since it captured the Ghanaian classroom environment), then added a narration accompanied with pictures of all the relevant facilities and navigators for directing through the video. In doing this, the researcher realized the concepts will be grasped better and also, added to their understanding in many ways that will exceed the traditional classroom teaching pedagogical method.

The developed educational video which is user friendly was distributed to all the participated senior high schools to be used for teaching the wheel throwing skills. The feedbacks received from the respondents after using the educational

video were numerous as the video catered for all their expectation in wheel throwing skills.

It can be concluded from the study that if Ministry Of Education, Management of Schools as well as the ceramics department does what are expected from them like providing enough funding, facilities, posting highly qualified teaching and non-teaching personnel, infusing educational technologies such as video into lessons, providing abundant local raw materials base with well-structured syllabus for the realization of its intended goal, and evaluation from time to time to determine the problems militating against success, ceramics education will be achieved at a higher level to improve the standard goals.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents the summary of the study, the conclusions and the recommendations. It also covers areas for further studies.

Summary of the Research Process

The study was designed to ascertain the effects of educational video on the teaching and learning of wheel throwing skills in SHS in the Cape Coast Metropolis. The total population for the study was 378 third year ceramics students and teachers in the SHS of Cape Coast Metropolis. The sample size for the study was 126 SHS students drawn from the Cape Coast Metropolis. The stratified sampling technique was used to achieve the sample size. Out of the 126 questionnaires that were administered, 125 respondents returned the questionnaires. The research design that was used was the descriptive research design. The following hypotheses were formulated to guide the study;

H0 1: There is no statistical significant difference in the perception of teachers on teaching and learning wheel throwing skills in ceramics education in the Senior High Schools.

H0 2: There is no statistical significant difference in the perception of students on teaching and learning wheel throwing skills in ceramics education in the Senior High Schools.

H0 3: There is no statistical significant difference in the opinions of teachers and students on the availability of ceramics resources for teaching and learning wheel throwing skills in the Senior High Schools.

H0 4: There is no statistical significant different in the effect of educational video on teaching and learning of wheel throwing skills in the ceramics education.

Key Findings

The following were the key findings that emanated from the study;

1. There is difference in the perception of teachers on teaching and learning wheel throwing skills in ceramics education.
2. There is difference in the perception of students on teaching and learning wheel throwing skills in ceramics education.
3. There is difference in the opinions of teachers and students on the availability of ceramics resources for teaching and learning wheel throwing skills in the senior high schools.
4. There is no difference in the effect of educational video on teaching and learning wheel throwing skills in ceramics education.

Conclusions

From the findings of the study, the researcher can conclude that there are differences in the perception of teachers on teaching and learning wheel throwing skills in ceramics education. This implies that the teachers do not have the same ideas on teaching and learning wheel throwing skills in ceramics education. It is worth noting here that there are differences in the perception of students on

teaching and learning wheel throwing skills in ceramics education. This may be as a result of differences in their gender. Also, the results portrayed that there are differences in the opinions of both teachers and students on the availability of ceramics resources for teaching and learning wheel throwing skills in the senior high schools. This could be due to the absence of most modern facilities, equipment, tools and inadequate materials that are used in classrooms and studios to meets their needs.

Finally, it can be concluded that there is no difference in the effect of educational video in teaching and learning wheel throwing skills in ceramics education. The usage of educational video in the teaching and learning of wheel throwing skills largely depends on organizational factors such as the beliefs, feelings and thoughts of Management of the Senior High Schools towards the infusion of computer technology in teaching. Due to the capital intensive nature that goes with the provision of state of the art technology, its availability in Senior High Schools largely depends on management of the schools who take decision and control the finances of the schools. Students can only use the facilities the management is able to provide for them.

Recommendations

Based on the strengths of the findings of the study, the following recommendations were made:

1. This study has pursued the argument that educational video has positive effect on the teaching and learning of wheel throwing skills in the SHS. However, time allocation on the schools' time table for visual arts

practical is inadequate. There should be more time allocation on the schools' time table to allow for effective Visual arts practical lessons including the teaching and learning of educational video.

2. Management of the SHS should procure state of the art equipment to furnish the Visual arts laboratories in their schools. This will facilitate the infusion of educational video and enhance practical lessons especially wheel throwing skills.
3. Management of the schools should contact the old students' associations of their schools, PTAs, and cooperate organisations to provide funding for the procurement of facilities like basic ceramics equipment for the Visual arts department.
4. Teachers who do not have the requisite knowledge must not be allowed to teach ceramics.
5. There is the need for visual arts to be included in the school curriculum as learning to see aesthetically.
6. Varieties of clays should be provided to the students in our schools (SHS)/colleges for practices and experiments. When the knowledge obtained in the schools/colleges is being transferred properly and confidently to the younger students, they will be excited and eager to enroll into ceramics courses in advance level leading to better and qualitative products. Also understanding of the chemical aspects of the clay would be easier and faster for them and they could know which clay is suitable for particular purposes. A good knowledge of clay by the students is essential

since they are going to transfer such knowledge to the younger ones in the basic schools.

7. Parents should encourage their wards to study art and provide guidance and counselling, while the students themselves supply washed clay to Saltpond Ceramics Factory to subsidize their fees.
8. Educational video as a technology provide students with the opportunity to learn at their own pace and the freedom to go back and relearn content whenever they want. This could be especially important for students and students with learning disabilities.
9. In-service training on modern teaching methodology had to be organized periodically for members of the teaching staff to upgrade their knowledge in teaching methods.
10. Practical lessons should be undertaken more often for improvement.
11. The Chief Examiners report should be made available to teachers to help them in their teachings.

Suggestions for Further Research

Future studies could look at challenges in the integration of Information and Communication Technology (ICT) in Visual arts Education in Senior High Schools in the Cape Coast Metropolis.

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APPENDIX A

UNIVERSITY OF CAPE COAST

COLLEGE OF DISTANCE EDUCATION

DEPARTMENT OF INFORMATION TECHNOLOGY IN EDUCATION

QUESTIONNAIRES FOR TEACHERS

Dear Respondents

This questionnaire has been designed to solicit information for a research work being undertaken on the topic "Effect of educational video on students wheel throwing skills in the senior high schools of Cape Coast Metropolis". You have been selected as one of the favourable respondents. The information given through this questionnaire is purely for academic purposes, but the recommendations there may be beneficial to your institution. Please complete all items even if you feel that some are redundant. I would be grateful if you could provide frank answers to the questions. Your anonymity and confidentiality of answers provided in the questionnaire is assured. Thanks for being part of this study.

Instructions: Pleased kindly tick [√] where necessary

SECTION A: Background Characteristics of Respondent

1. Sex a) Male [ ] b). Female [ ]
2. Highest academic qualification:
   a) Diploma [ ]
   b) First Degree [ ]
   c) Second Degree [ ]

d) Others [ ]

3. What is your current position in the school?

a) H.O.D. [ ]

b) Teacher [ ]

c) Service personnel [ ]

d) Intern [ ]

4. What is your status in the profession?

a) Professional Teacher [ ] b) Non-professional [ ]

5. How many years have you taught ceramics

a) 1-5 years [ ] c). 11-15 years [ ]

b) 6-10 years [ ] d). 16 and above [ ]

SECTION B: GENERAL KNOWLEDGE ON ICT AND WHEEL THROWING SKILLS

Please indicate the extent to which you agree or disagree to the following statements concerning your knowledge on wheel throwing skills and ICT by ticking 5=Strongly Agree (SA), 4=Agree (A), 3=Uncertain (U), 2=Disagree (D) and 1=Strongly Disagree (SD)

Statements	SD	D	U	A	SA
6. Wheel throwing is one of the favorite topic of everyone studying Ceramics					
7. Everyone studying ceramics have basic skills in wheel throwing					
8. All teachers handling ceramics have					

competency in wheel throwing					
9. Wheel throwing is a skill					
10. Anybody who has specialized in ceramics can tell when prepared clay is plastic enough and suitable to throw with.					
11. Teachers and students in my school have basic skills in ICT					
12. My school has a computer lab					
13. All the computers and its accessories are in good condition					
14. Teachers and students have access to the computer lab without restriction					

SECTION C: TEACHERS PERCEPTION TOWARDS WHEEL THROWING SKILLS

Please indicate the extent to which you agree or disagree to the following statements concerning your perception on wheel throwing skills by ticking 5=Strongly Agree (SA), 4=Agree (A), 3=Uncertain (U), 2=Disagree (D) and 1=Strongly Disagree (SD)

Statements	**SD**	**D**	**U**	**A**	**SA**
15. Studying wheel throwing is a waste of time					
16. Wheel throwing becomes difficult when the					

requisite resources are inadequate and are unavailable					
17. Teaching /learning wheel throwing skills through the traditional face to face demonstration is not enough to develop artistic skills					
18. Educational video does not provide a better experience and cannot stimulate creativity in student, if use as an instructional material for teaching					
19. Educational video is affordable and if I begin to use, I will be dependent upon it.					

SECTION D: AVAILABILITY OF RESOURCES FOR TEACHING AND LEARNING WHEEL THROWING SKILLS

Please indicate the extent to which you agree or disagree to the following statements concerning your view on availability of resources for teaching and learning wheel throwing skills by ticking 5=Strongly Agree (SA), 4=Agree (A), 3=Uncertain (U), 2=Disagree (D) and 1=Strongly Disagree (SD)

Statements	SD	D	U	A	SA
20. My school has resources lab/studio for ceramics department					
21. The Ceramics Department in my school has all the equipment/materials/tools for wheel throwing					
22. The potter's wheels at Ceramics Department are adequate for wheel throwing practicals					
23. All the potter's wheel are in good condition and functioning well					
24. The school is always supporting the Ceramics Department with adequate facilities					

SECTION E: RELEVANCE OF SCENES FROM THE VIDEO "WHEEL THROWING SKILLS DEMONSTRATION"

Please indicate the extent to which you agree or disagree to the following statements concerning your view on availability of resources for wheel throwing skills by ticking 5=Strongly Agree (SA), 4=Agree (A), 3=Uncertain (UN), 2=Disagree (D) and 1=Strongly Disagree (SD)

Statements	SD	D	U	A	SA
25. I Find it easy to understand the content in the wheel throwing video					
26. I like watching the wheel throwing video to the end					
27. The wheel throwing video makes me feel confident to practice independently without guidance					
28. I believe educational video should be integrated in wheel throwing lesson to improve teaching and effect learning					

SECTION F: CHALLENGES FACING TEACHING AND LEARNING OF WHEEL THROWING SKILLS IN CERAMICS EDUCATION

Please indicate the extent to which you agree or disagree to the following statements concerning your view on factors affecting teaching and learning of wheel throwing skills in ceramics education by ticking 5=Strongly Agree (SA), 4=Agree (A), 3=Uncertain (U), 2=Disagree (D) and 1=Strongly Disagree (SD)

Statements	SD	D	U	A	SA
29. Teachers in the senior high schools teaching ceramics subject must have competency in wheel throwing skills					
30. Schools should support the visual arts department including ceramics section with resources					
31. The Ministry of Education and Ghana Education Services should provide various schools offering practical oriented subject with adequate resources					
32. Teachers and students must be encouraged to participate in development course related to ICT.					
33. The ceramics periods on the time table should be made to satisfy practical lesson					

APPENDIX B

UNIVERSITY OF CAPE COAST

COLLEGE OF DISTANCE EDUCATION

DEPARTMENT OF INFORMATION TECHNOLOGY IN EDUCATION

STUDENTS' QUESTIONNAIRES

Dear Respondents

This questionnaire has been designed to solicit information for a research work being undertaken on the topic "Effect of educational video on students wheel throwing skills in the senior high schools of Cape Coast metropolis". You have been selected as one of the favourable respondents. The information given through this questionnaire is purely for academic purposes, but the recommendations there may be beneficial to your institution. Please complete all items even if you feel that some are redundant. I would be grateful if you could provide frank answers to the questions. Your anonymity and confidentiality of answers provided in the questionnaire is assured. Thanks for being part of this study.

Instructions: Please kindly tick [√] where necessary

SECTION A: BACKGROUND CHARACTERISTICS OF RESPONDENT

1. Sex a) Male [ ] b). Female [ ]
2. Age distribution
   a) 15 years [ ]
   b) 16years [ ]
   c) 17 years [ ]

d) above 17 years [ ]

3. Forms/levels

a) S.H.S. 1 [ ] b. SHS 2 [ ] c. SHS 3 [ ]

4. Area of specialization

a. Ceramics [ ] c). Leather Work [ ]

b. Sculpture [ ] d). Other [ ]

5. How many years have you learn Ceramics?

a) One year [ ]

b) Two years [ ]

c) Three years [ ]

SECTION B: GENERAL KNOWLEDGE ON ICT AND WHEEL THROWING SKILLS

Please indicate the extent to which you agree or disagree to the following statements concerning your knowledge on wheel throwing skills and ICT by ticking 5=Strongly Agree (SA), 4=Agree (A), 3=Uncertain (U), 2=Disagree (D) and 1=Strongly Disagree (SD)

Statements	SD	D	U	A	SA
6. Wheel throwing is one of the favorite topic of everyone studying Ceramics					
7. Everyone studying ceramics have basic skills in wheel throwing					
8. All teachers handling ceramics have competency in wheel throwing					

9. Wheel throwing is a skill					
10. Anybody who has specialized in ceramics can tell when prepared clay is plastic enough and suitable to throw with.					
11. Teachers and students in my school have basic skills in ICT					
12. My school has a computer lab					
13. All the computers and its accessories are in good condition					
14. Teachers and students have access to the computer lab without restriction					

SECTION C: STUDENTS PERCEPTION TOWARDS THROWING SKILLS

Please indicate the extent to which you agree or disagree to the following statements concerning your perception on throwing skills by ticking 5=Strongly Agree (SA), 4=Agree (A), 3=Uncertain (U), 2=Disagree (D) and 1=Strongly Disagree (SD)

Statements	**SD**	**D**	**U**	**A**	**SA**
15. Studying wheel throwing is a waste of time					
16. Wheel throwing becomes difficult when the					

requisite resources are inadequate and are unavailable					
17. Teaching /learning wheel throwing skills through the traditional face to face demonstration is not enough to develop artistic skills					
18. Educational video does not provide a better experience and cannot stimulate creativity in student, if use as an instructional material for teaching					
19. Educational video is affordable and if I begin to use, I will be dependent upon it.					

SECTION D: AVAILABILITY OF RESOURCES FOR TEACHING AND LEARNING WHEEL THROWING

Please indicate the extent to which you agree or disagree to the following statements concerning your view on availability of resources for teaching and learning wheel throwing by ticking 5=Strongly Agree (SA), 4=Agree (A), 3=Uncertain (U), 2=Disagree (D) and 1=Strongly Disagree (SD)

Statements	SD	D	U	A	SA
20. My school has resources lab/studio for ceramics department					
21. The Ceramics Department in my school has all the equipment/materials/tools for throwing					
22. The potter's wheels at Ceramics Department are adequate for wheel throwing practicals					
23. All the potter's wheel are in good condition and functioning well					
24. The school is always supporting the Ceramics Department with adequate facilities					

SECTION E: RELEVANCE OF SCENES FROM THE VIDEO WHEEL THROWING DEMONSTRATION

Please indicate the extent to which you agree or disagree to the following statements concerning your view on availability of resources for throwing by ticking 5=Strongly Agree (SA), 4=Agree (A), 3=Uncertain (U), 2=Disagree (D) and 1=Strongly Disagree (SD)

Statements	SD	D	U	A	SA
25. I Find it easy to understand the content in the wheel throwing video					
26. I like watching the wheel throwing video to the end					
27. The wheel throwing video makes me feel confident to practice independently without guidance					
28. I believe educational video should be integrated in wheel throwing lesson to improve teaching and effect learning					

SECTION F: CHALLENGES FACING TEACHING AND LEARNING OF WHEEL THROWING IN CERAMICS EDUCATION

Please indicate the extent to which you agree or disagree to the following statements concerning your view on factors affecting teaching and learning of wheel throwing in ceramics education by ticking 5=Strongly Agree (SA), 4=Agree (A), 3=Uncertain (U), 2=Disagree (D) and 1=Strongly Disagree (SD)

Statements	SD	D	U	A	SA
29. Teachers in the senior high schools teaching ceramics subject must have competency in wheel throwing skills					
30. Schools should support the visual arts department including ceramics section with resources					
31. The Ministry of Education and Ghana Education Services should provide various schools offering practical oriented subject with adequate resources					
32. Teachers and students must be encouraged to participate in development course related to ICT.					
33. The ceramics periods on the time table should be made to satisfy practical lesson					

APPENDIX C

INTRODUCTORY LETTER

UNIVERSITY OF CAPE COAST

College of Distance Education

Tel No: 03321 - 36947
Fax: 03321 - 36946
E-mail cce@ucc.edu.gh

University Post Office
Cape Coast

Our Ref. No: CCE/MED/17/Vol.1/077

2nd October, 2017

Your Ref. No:

INTRODUCTORY LETTER FOR DATA COLLECTION

The bearer of this letter, Grace Ruth Morrison, is a Master of Education student of the College of Distance Education, University of Cape Coast. She is writing her dissertation topic: **"EFFECT OF EDUCATIONAL VIDEO ON STUDENTS THROWING SKILLS IN THE SENIOR HIGH SCHOOLS OF CAPE COAST METROPOLIS"**

We shall be grateful if she could be given the necessary assistance from your good office to enable her complete her study on schedule.

We appreciate your co-operation.

Yours faithfully,

Paul Nyagorme (PhD)
Coordinator, M.Ed IT Unit