AUDIO-VISUAL RESOURCES INFLUENCE ON PERFORMANCE OF STUDENTS IN ART AND DESIGN IN SECONDARY SCHOOLS IN KAKAMEGA COUNTY, KENYA.

MUTESHI RUTH
E55/CE/34845/2016

A THESIS SUBMITTED IN PARTIAL FULFILLMENT FOR THE AWARD OF MASTERS OF EDUCATION (EDUCATION, COMMUNICATION AND TECHNOLOGY) TO THE SCHOOL EDUCATION AND LIFELONG LEARNING OF KENYATTA UNIVERSITY

NOVEMBER 2023

DECLARATION

I declare that this research thesis is my original work and has not been submitted to any other university for certification. The thesis has been complemented by referenced sources duly acknowledged. Where text, data including graphics, pictures or tables have been borrowed from other sources, including the internet, these are specifically accredited through referencing in accordance with anti-plagiarism regulations.

Sign ……………………………………Date ………………………………

Muteshi Ruth

E55/CE/34845/2016

Supervisors:

We confirm that the work contained in this proposal was carried out by the candidate under our supervision as University Supervisors.

Sign ……………………………………Date ………………………………

Dr. Bernard Mugo Chomba

Department of Educational Communication and Technology

Kenyatta University

Signature ………………………………Date ………………………………….

Dr. David Oludhe

Department of Educational Communication and Technology

Kenyatta University

Signature ………………………………Date ………………………………….

Prof. Samson Rossana Ondigi

Department of Educational Communication and Technology

Kenyatta University

DEDICATION

I dedicate this work to my immediate family and all my friends. First, I thank God for his immense goodness that has seen me this far in my studies. Special gratitude to my dear parents for laying a foundation for my academic journey. To my husband whose inspiring words of encouragement strengthened me, even when I felt like quitting. Besides, I dedicate this work to my lovely children. Your smile, patience, and promise of a bright future kept me fixed on the goal.

ACKNOWLEDGEMENT

First, much thanks to God for this far in my academic journey. To my supervisors, Dr. Mugo Chomba for the step-by-step guidance he accorded me throughout this thesis; Prof. Samson Rosanna Ondigi for his wisdom and ongoing assistance in the duration of writing this thesis, and Dr. David Oludhe for his assistance in the knowledge of the subject matter, and thoughtful criticism. My sincere appreciation to the late Dr. Isaac Minae Mwangi for setting the pace of my study and my friend Dr. Iddrisu Bariham for his scholarly pieces of advice. I also express my deepest gratitude to all the participants who played different roles in aiding this study to realize its research objectives. These include; the western region education office county education office of Kakamega, principals, Art and Design teachers and the students from the sampled school. I'll never be able to adequately thank each and every one of you. Thank You.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

AD	Art and Design
ADT	Art and Design Test
ANCOVA	Analysis of Covariance
ANOVA	Analysis of Variance
AV	Audio Visual
CEO	County Education Office
TSC	Teacher Service Commission
CAI	Computer Aided Instruction
CLT	Cognitive Load Theory
CM	Conventional Method
CG	Control Group
EG	Experimental Group
ICT	Information Communication and Technology
KCPE	Kenya Certificate of Primary Education
KNEC	Kenya National Examinations Council
KCSE	Kenya Certificate of Secondary Education
MOE	Ministry of Education
NACOSTI	National Commission for Science, Technology and Innovation
SPSS	Statistical Package for Social Sciences

ABSTRACT

Art and Design (AD) is one of the elective subjects taught in secondary schools in Kenya. In the electives, the learners are presumed to perform exemplary well but that has not been the case in the secondary school in Kenya, Kakamega County included. Documentary evidence from KNEC report 2019;2018;2017;2016; indicates that the subject has had an unimpressive performance of scoring below tertiary level entry requirement. To curb this, one remedy explored among others is the use of Audio-Visual resources (AV) in the instruction process that has proven to enhance understanding, innovation and creativity among learners. These are key aspects in AD subject that can enable learners to improve in performance. The purpose of the study was therefore to investigate the influence of AV resources on students' performance in AD in secondary schools in Kakamega county, Kenya. To achieve this, this study was guided by the following specific objectives; establish the type of AV resources used in the instruction of Art and Design, establish the extent to which AV resources are used in the instruction of Art and Design, assess the influence of AV resources on the performance of students in Art and Design and establish gender difference in Art and Design academic performance when students are taught using AV resources. The cognitive load theory provided the theoretical guideline for this study. The research methodology used was mixed method for gathering the qualitative and quantitative data. The design was quasi-experiment of the Solomon four non-equivalent control group. Schools were purposively sampled, grouped in strata then randomly sampled to make up the four secondary schools consisting of two boys' and girls. Sixty form two AD students, four teachers, and two principals made up the study's respondent. The experiment group was taught using the AV resources while the control group was taught using the traditional method. Both groups were pre-tested prior to intervention and later post-tested. The gathering tools included: tests, teachers' questionnaires, interviews, and a checklist. The data was analyzed using both descriptive and inferential statistics. The differences between the group means were analyzed using the t-test, and the Chi-Square technique. The statistical significance was tested at $\alpha = 0.05$. The finding of this revealed that AV resources there was a significant difference in performance between the experimental groups and control groups with students of the experimental group obtaining higher scores than the control group. When gender in performance was compared, it revealed no statistical significance. The study further revealed that available AV resources in schools were included chalkboards, charts, textbooks, and very little modern AV resources such as computers, projectors, laptops, smartphones, and cameras. The schools also had electricity and internet infrastructure. Despite having these resources, there was low level of utilization in the instruction of AD. Based on the findings, the study recommended adequate funding for the acquisition of modern AV resources and their accessories such as internet and power, refine teachers' pedagogical skills through regular retooling on new trends in classroom instruction such as use of AV resources in order to realize acquisition of 21st century in learners and Formulate policies and measures that confines teachers towards utilization of AV resources in the classroom instruction.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Art is the human ability to transform an idea, experiences, emotions, and feelings into a form through creativity and expertly for an aesthetic focus. Design on the other hand, refers to the process of planning, sketching, and outlining concepts of something before it is produced. Art and Design (AD), therefore, involve systematic planning and outlining of ideas provoked in an individual mind into a form that can be viewed from the outside. Art education offers learners an opportunity for stimulating creativity and imagination, by thinking critically and originating different ideas that solve a problem and bring change (Sions, 2014). Similarly, Ulger (2018) brings forth the fact that art students have an advantage since they utilize creative and critical thinking in art production hence, developing these skills that are very crucial in today's world. This field that enables learners to develop the power of observation, analytical ability, and practical attitude. It is, therefore, desirable for every individual to possess some comprehensive knowledge of AD.

Moreover, the global 21st-century pace of change in education and the economy, demands learners who can think critically and originate ideas that can solve problems, this agitates greater emphasis and demand for AD education in most countries in the world (Starko,2017).According to Knight (2014), reducing art education contradicts one of the main global educational goals, which is to prepare students for a work market that offers opportunities that require creative thinking and problem-solving abilities. Kenya like other countries has made major reforms in education to align with global standards and achieve Vision 2030, among them the adoption of Sessional Paper No. 2 of 2015 on 'Reforming Education and Training in Kenya' which led to the development of a Competency Based Curriculum (CBC). Art and Design is an essential subject in the curriculum since it provides learners with an opportunity to acquire CBC core competencies. Besides, the subject has been in the curriculum since independence where it has been referred to (Art and craft or creative art) in primary school while in secondary school as an elective subject among a cluster of other industrial/technical subjects.

However, in Kenya, according to the KNEC reports (2016-2020), national candidature for form four students registered in this subject has consistently been below one percent of total national candidature. Wagah et al., 2009; Kinyua, 2017 also points out similar findings on low enrollment of students in this subject and persistent trend that was threatening its survival which was worrying to the stakeholders. They further attributed the problem to unimpressive performance, the unpopularity of the subject, and the negative attitude among other reasons Table 1.1 below, displays the wanting situation in the number of candidatures and the overall country mean score for the previous five years, performance.

Table 1.1: Candidate's Overall Performance in AD from 2015 to 2019

Year	Paper	Candidature	Maximum Score	Mean Score	Standard Deviation
2019	1		60	31.89	8.04
	2		100	56.17	13.79
	3		40	21.09	4.97
	Overall	**1278**	**200**	**109.15**	**26.8**
2018	1		60	31.61	9.02
	2		100	55.17	12.63
	3		40	21.16	5.13
	Overall	**1,314**	**200**	**107.86**	**22.74**
2017	1		60	29.49	8.49
	2		100	63.31	11.46
	3		40	19.69	5.02
	Overall	**1,136**	**200**	**112.31**	**21.65**
2016	1		60	35.79	11.31
	2		100	64.32	11
	3		40	23.8	6.4
	Overall	**1,257**	**200**	**123.61**	**24.44**
2015	1		60	29.97	9.41
	2		100	57.47	14.28
	3		40	19.95	5.42
	Overall	**1,246**	**200**	**107.37**	**24.07**

Source; *KNEC yearly KCSE reports for the years, 2015, 2016, 2017 ,2018 and 2019*

The performance of AD is unimpressive. For a student to qualify for an AD related field at the tertiary level, performance in the subject should be exemplary good with a minimum of 58% or (C+.) in KCSE performance. The mean of 60% and above attained in 2016 seems to be unsustainable. There is a decline of 7.24% in the overall mean in 2019 from 2016. The national candidature for this subject compared to the total number who sat for the exam in 2019 and 2018 is also still below 1% (KNEC 2019 Report).

Table1.2: KCSE national performance in some technical subjects in 2018 and 2019

Subjects	2018	2019
Art and Design	53.93	54.57
Building & construction	69.19	73.65
Computer	57.36	60.42
Drawing and Design	67.61	64.51
Electricity	64.46	63.53

Source: *KNEC Report 2018,2019*

Table 1.2 shows that KSCE performance of students in other technical subject is better than that of AD. Technical subjects are presumed to register exemplary performance since they are electives, and students specialize in them depending on their strengths. In Kakamega County the country's situation is replicated, low enrolment of candidature with some schools enrolling one student and the number of schools offering AD subject in the county drastically going down with some sub-county having no single school that offered the subject (CEO)-2020, Kakamega).

Table1.3: KCSE Art and Design Candidates' Performance in the Years 2015 to 2019 in Kakamega County

Year	2015	2016	2017	2018	2019
Candidature	176	185	189	174	192
Means score for county	51.17	66.08	57.67	54.01	55.87
Lowest mean score	16.00	26.19	28.60	24.31	28.73

Source: *County Education Office (CEO) Kakamega,2020*

Table 1.3 indicate four years recording scores below 60% with the year 2016 county mean raising to 66%. This implies that attainment of a 60% score and above in the subject is possible but maintenance of the desired performance in this subject seems to be a problem. There is a decline of 12.07% between 2016 and 2018 despite an improvement noted in 2018 from 2017. This situation indicates lack of consistency and unpredictable performance in AD which is not impressive. It is further notable that some public schools in the county registered very low mean way below the average of the county and low candidature of as low as one in some schools in the county (CEO-Kakamega,2020). The same trend was noted by (Ongachi et al., 2013), that in western Kenya, there has been a striking decrease in the total number of secondary schools offering AD subject. Study further pointed out that, it was an indicator that there was a problem to be looked into in the subject which contributed to students getting low scores. Subsequently, the schools' administrators opted to do away with the subject to avoid low scores that may affect the overall mean score of the school. This makes this study necessary to address the problem, especially in public schools.

The AD examination in KCSE consists of 3 papers; the first paper is theory scored out of 60, the second paper is a sit-in practical scored out of 100 and the third paper is also practical which is examined in form of a project scored out of 40 all adding up to 200 marks. Performance in paper one has been wanting and poor performance in the subject is attributed to students lacking how to conceptualize the different processes involved in developing an artwork. This paper examines all areas of AD with questions aiming to capture key concepts structured in the syllabus which include; definitions of terms, materials and tools, and techniques or processes of producing artwork. Theoretical concepts in AD enables a student to appreciate the art style, broaden their thinking scope and creatively make an art form. Topics in the subject are practical oriented with very minimal theoretical explanations in the course books which makes it abstract for teachers to explain to learners. KNEC report 2019,2018,2017, painting questions were poorly performed in both papers one and two, and many students opted to do the graphic design question. This means that teaching painting concepts may require a different pedagogical approach to make it simpler for students to understand and pick up the necessary information. Therefore, it is necessary that teachers seek innovative teaching and learning methods such as Audio Visual (AV) resource integrated approach for the instruction of abstract concepts in painting for easier understanding and ultimately improving the performance of learners in the area and AD subject as a whole.

The fundamental principle of achieving superior student achievement through student-teacher interaction has remained at the heart of technology developments. Inevitably, education is taking its cue from how corporate organizations are deploying new audiovisual (AV) solutions. De Bernardes and Olsen (1948), pointed out that schools have been using AVs for decades which came in form of drawings and pictures with spoken narrations before the age of a TV and radio player. However, this has been improved use of computer technology which comes with plenty of advantages marking the period where AV aids are linked to multimedia. The age of internet has brought greater interactivity, connectivity, and flexibility enhancing creation and distribution of educational content on online platforms such as YouTube and Facebook to anyone using AV media and connected to the World Wide web. Ranasinghe and Leisher (2009) synonymously agreed that the complexity of teaching and learning aids is tightly tied to technological advancement, hence its apparent that traditional media technologies fail to satisfy the requirements of the classroom instruction process. This has resulted into adoption of digitized AV resources which provides a learning environment that is self-paced, learner-controlled and individualized. Currently, it is becoming a regular practice for teachers to use AV aids in the teaching of various subjects and many studies have been conducted to examine their value in teaching and learning (Mathew & Alidmat, 2013; Oyesola, 2014). However, the numerous advantages of these aids can be assumed to apply in all areas but the nature and diverse content in the various learning area such as science, social sciences, and practically based subjects makes it necessary to carry out studies to investigate if Audio Visual resources can ease the instruction process in specific areas.

According to Aggarwal (2009), utilization of AV resources helps the teacher effectiveness in ensuring the learning is real, interesting, meaningful, as well as flamboyant. AV resources contributes to high learners recall and retention of knowledge, Proper reasoning and thinking ability, captures imagination and ensures smooth learning development. Ashaver and Igyuve, (2013) also defines AV resources as materials with both auditory and visual presentation which enhance teaching and learning particularly in improving comprehension and retention making learning easier and more interesting. Asma, (2015) views audiovisual aids as devices helpful since they help in establishing and clarifying concepts which are accurate and provides proper interpretation. Through AV resources, the teacher is able to make more effective and concrete learning experience. Therefore, it's agreeable that AV assumes more diverse presentations by combining pictures, animations, videos, words, sounds, and interactions which enhance the teaching and learning process.

AV materials play key roles in learning process. They include: basing learning on simulated interesting sensory experience, individualizes instruction and making learning permanent, (Omoniwa & Emmanuel 2019). Swank (2011) further stressed the importance role AV materials play in learning. This study estimated that about 40% of our concepts are based upon visual experience, 25% on auditory, 17% on tactile, 15% on miscellaneous organic sensation, and 3% upon taste smell. In the 21st century era, AV aids when conferred to the internet bring plenty of advantages such as creating a blended learning environment, improving collaboration skills, differentiated learning, and learning with a lot of fun (Harcourt, 2020). With the above declaration, the importance role played by AV materials in teaching and learning process is significantly very clear.

Countries in the western world such as Cuba and Canada and most of states in the USA have highly integrated advanced AV tools and Computer-aided instruction making it a common practice in the classroom at all levels of learning (Karehka,2013). The National Council for Accreditation of Teacher Education (1997) published a report indicating that United States teacher education had been redesigned in a way that the new teachers are prepared on instructing with AV tools that are relevant in today's classroom. This groomed emergence of virtual classrooms and learning going beyond the classroom, using various online platforms and making individualized learning popular among U.S.A schools. These facilities in the U.S.A. are properly utilized because of the availability of enabling resources such as internet connectivity, availability of electricity, education policies that support the use of AV tools, and available modern 21st Century AV resources across all levels of learning (Harcourt, 2020).

In Europe, Superior learning outcomes for every educational institution has been enables through adoption of AV technologies (Bussell,2019). Therefore, there is an increasing demand for up-to-date AV technologies that will realize the optimum achievement of instruction objectives. He further argues that staying abreast of today's and tomorrow's possibilities in a fast-moving environment is essential. This philosophy has pushed European countries to equip most of their schools' learning spaces with more current AV resources. Britain, has plenty of advanced AV tools in their learning spaces such as chalkboard recorders, catch boxes, smart boards, audio-video conferencing, projectors, and computers. Teachers and learners have advanced skills in these media creating a successful digital AV-oriented instruction process. Like the U.S.A, Europe learning spaces are well equipped with current AV aids that measure up to societal and technological demand and their teachers and learners have a vast knowledge of them (Harcourt, 2020).

In Asia, a greater milestone in education technology has been achieved with the innovation and adoption of advanced AV resources in classroom instruction attained in countries such as Japan in the lead. Other Countries in this continent have strived to integrate advanced AV resources in class instructions that enrich their learners with advanced skills in technologies that ratio to their economic and social standards (Malaysia Tang and Intai, 2018). The study also indicated that, rural secondary schools in Asia were sufficiently equipped with LCD projectors and computers that enabled an AV integrated lesson. They further noted that teachers had the necessary technical competencies to utilize these audiovisual aids.

In African countries, AV resources that are commonly in use include chalkboards, charts, and models, most of which are regarded as 'primitive technology' but a majority of the developing countries are adopting new trends in education technology. Ibe and Abamuche (2019) noted that most secondary classrooms in Nigeria have remained ‘chalk and board’ unlike the tertiary institution that has adopted new AV technology in the instruction. (De Souza & Richter,2017) noted that South African education training and system must respond to the information and technological revolution pressure. They further stated that training of teachers in South Africa has factored in the need for aspirant teachers to get enough exposure to the integration of educational technology to expand the wide use of digital AV media that creates an exciting learning environment. In Tanzania Mwakapina (2016), pointed out that most students in the country are technologically based generation, therefore, teachers should adopt a variety of AV tools offered by modern technology such as mobile phones, computers, and smart boards which enable the instruction process to happen in and outside the classroom. He further acknowledged that the government of Tanzania recommends student-directed methods of learning that utilize AV media and internet.

In Kenya, the adoption of Sessional Paper No. 2 of 2015 on ‘Reforming Education and Training in Kenya’ which emphasized technology and appropriate pedagogy, led to unprecedented demand to embrace the use of ICT pedagogical tools or technological teaching aids which are generally called ‘Audio Visual’ aids. Like Nigeria, Muteheli (2017), agrees that basic levels in Kenya have not adopted the new AV technologies in the same way as the tertiary institution. The study further exposed that some teachers in secondary schools agreed and understood that Audio Visual tools were very important during lesson delivery but only stuck to the lecture method. Also, it was notable that the exam-oriented system of education also made teachers focus more on how to make students pass exams instead of finetuning the methods of teaching among them the use of AV media that makes learning an interesting and enjoyable experience for students. However, a politically ignited move in 2016 to provide Kenyan class one pupil in public primary school's tablets with customized content is one of the bigger establishments of AV technology in the Kenyan classroom. A report by MOE (2016), indicated that the move was to radically change teaching and learning from the conventional way of chalk and talk to the use of AV tools that are captivating, with content presented in an easier way for learners to understand. MOE acknowledges that digital AV resources are very useful in enhancing teaching and learning in Kenya. Therefore, in light of these circumstances, the researcher found it necessary to carry out this study on AV resources influence on students' performance in AD in Kakamega County , Kenya.

1.2 Statement of the Problem

Art and Design subject is central to providing an opportunity for students to acquire the essential skills in the 21st century that Kenya is focused to achieve in Vision 2030. Key among the skills nurtured by the subject is creativity and imagination which are fundamental in problem-solving and bringing change in life. However, the performance and candidature of students in the Kenya Certificate of Secondary Education (K.C.S.E) examination in the past five years has been low (KNEC 2015,2016,2017,2018,2019). In Kakamega county, for instance, performance registered for the past five years has been unsatisfactory with some schools recording a mean of as low as 16% and a low candidature of up to one (C.E.O,2019). Academic performance depends on different contributing factors in teaching and learning among them pedagogy and resources.

Innovative classroom strategies such as AV uses are proposed in the competence-based curriculum as superior tools that enhance classroom learning process. This means adoption of AV in the instruction of AD could enhance understanding of abstract concepts in Painting that seems challenging to students yet the topic is apportioned twenty-one hours which is more than most of the other topics (KNEC,2019). These resources when used appropriately, provoke students' curiosity which steers them to think critically and articulate their ideas creatively that are directed to solve a problem.

However, there is the scarcity of documented literature and empirical studies that have been conducted in the use of AV resources in the instruction of AD and its influence on performance especially in developing countries Kenya included. More studies in this concept are needed to address the gap of knowledge and offer solutions that can lead to skilled 21st-century graduates who would be active participants in the achievement of vision 2030 and also the achievement of Agenda 4, particularly in Kenya. Therefore, this study sought to investigate Audio Visual resource's influence on students' academic performance in AD in Kakamega county, Kenya

1.3 Purpose of the Study

The purpose of the study was to interrogate Audio Visual resources' influence on students' performance in AD in secondary schools in Kakamega county, Kenya. Utilization of Audio Visual resources is important because it enables students to gain a deeper understanding of concepts in the learning areas which could enhance good performance in the examination.

1.4 Objectives of the Study

The objectives which directed this research were to:

i. Establish the type of Audio-Visual resources used in the instruction of Art and Design.

ii. Find out the extent to which Audio-Visual resources were used in the instruction of Art and Design.

iii. Assess the influence of Audio-Visual resources on the performance of students in Art and Design.

iv. Establish gender differences in Art and Design academic performance when students are taught using Audio Visual resources.

1.4.1 Research Question

In line with the main goal of the study, the following question were formulated to guide the research:

i. What type of Audio-Visual resources were used in Art and design instruction?

ii. To what extent were the Audio-Visual resources used in the instruction of Art and Design?

1.4.2 Research Hypotheses

The following null hypothesis were formulated to guide the study and tested at a 5% level of significance.

Ho_1: There was no significant influence of AV resources on the performance of students in Art and Design.

Ho_2: There is no significant gender difference in AD performance when both boys and girls are taught using AV resources.

1.5 Significance of the Study

Knowledge about social phenomena is crucial to support an understanding of any existing challenges and developing the most appropriate resolutions. The education sector is dynamic and the regular changes in learning and instructional factors require the creation of new methodologies and tools to facilitate adaptability and meet the relevant objectives. This study comprehends that monitoring and evaluation of systems in the education sector are necessary to enhance adaptability and allow all stakeholders to realize their visions. The study has offered an opportunity to find out the type of AV resources used in the instruction of AD, evaluate the extent to which 21st-century AV tools are utilized in the instruction of AD in secondary schools, established the influence of AV resources on students' performance in AD and establish gender differences in AD academic performance when students are taught using AV resources. The findings of the research can influence AD teachers' choice on effective and efficient 21st-century AV tools in the teaching of abstract concepts. Findings also inform curriculum developers to fine-tune some abstract concepts in the AD curriculum to address the needs of 21st-century Art learners. This study may also act as an eye-opener to the Ministry of Education to realize issues related to AV technology such as policies for instructional purposes, reform teacher training education as well as funding resource acquisition in schools. This study may also trigger the need for the teachers' employers in Kenya to consider hiring more AD teachers in different secondary schools to give many students the chance to pursue the subject. The theory of instruction may benefit from this study's contributions.

1.6 Limitations and Delimitation of the Study

1.6.1 Limitations of the Study

This study was subjected to the following limitations which the researcher had no control.

i. The study's sampled groups were selected from public secondary schools. This research did not take into consideration private secondary schools because of uncertainties associated with being granted access to schools by some proprietors. The results of this study are limited to public secondary schools.

ii. The participants involved were from secondary schools offering AD in Kakamega county, limiting generalizability to secondary schools that do not offer the subject and are dispositioned in other geographical areas.

iii. Random selection of the sample group was not done due to the nature of the research design-quasi experimental design hence limited to purposive sampling.

iv. The number of respondents was a small group since the subject is in limited schools with few students pursuing it.

1.6.2 Delimitations

This study focused on different elements whose consideration defines its scope.

i. The focus was on secondary public schools in Kakamega county that fall within the 8-4-4 curriculum provision of the Kenyan education system as the most appropriate to reflect the relevant conditions. Therefore, the researcher did not assess any of the secondary schools following foreign curricula regardless of their contributions to AD teaching in the county.

ii. The respondents were drawn from four schools which included; four teachers and principals while students were a total of fifty from the respective schools selected. These students' respondents were drawn from Form two since they have acquired basic knowledge and skills in the subject. Form one was left out because they had no enough exposure to the area of study while forms three and four were excused to focus on their studies.

iii. The study only assesses how employing AV resources affects students' performance in Art & Design. This aspect derives from the absence of sufficient knowledge about the integration of AV media in this subject, an issue that this researcher intends to resolve. Therefore, the investigator did not assess the AV tools used in teaching other subjects. These conditions are necessary to ensure that the investigation adheres to its objectives and answers the relevant questions adequately.

1.7 Assumption of the study

This study was predicated on:

- The status quo during study period remained so that the objectives are not altered in any way. For instance, if the government were to change policies affecting instructional tools, then the instructors would not have accepted to adopt instruction tools that contravene MOE policies.
- The researcher also assumed that the purposive selection of participant was sufficient to eliminate biased influences on the investigation.
- This research also assumed that most of the respondents had a genuine interest in this study as a tool to provide information that would improve their workspace efficacy and overall professional competence. This

information was essential in ensuring that the study accomplishes its mission efficiently and offered the most relevant insight for the target population.

1.8 Theoretical framework

The Cognitive Load Theory (CLT), by John Sweller in 1998, served as the basis for this research. It provides theoretical guidelines on how human brain process and store information. The assumption is that there are three different types of memory in humans: sensory memory, working memory, and long-term memory. The working memory first stores sensory cues including sight, hearing, smell, taste, and touch before sending them to the sensory memory which is short-lived. This new information is then processed and transferred in to the working memory which has limited capacity, where if these new concepts are not coded in the long-term result in 'cognitive load'on the working memory (Anderson 1977; Baddeley 1983).

The main concept in CLT is because working memory is limited, learning experiences should be formulated to eliminate overloading this part of memory in order to promote schema acquisition. The working memory offers us cognizance and enables us to think both creatively and in a sequential manner to address difficulties, according to Baddeley (1993). In education research, CLT has broad implications for the pedagogy and choice of instructional material where it provides guidelines1that3help instructors to use instructional techniques that effectively present complex concept in a systematic and interesting manner that enables transfer of information from working memory to long-term memory thus learning and knowledge retention.

Furthermore, Pavio (1990), urged that visual concepts are received and processed differently from audio concepts. Further, he pointed out that learning can be enhanced more when the same concepts are simultaneously presented in audio and visual form. This implied that the auditory and visual systems of memory are separated, and that using both the visual and verbal systems simultaneously can increase working memory capacity (Cooper, 1998). Therefore, CLT is relevant to this study since the use of AV materials such as virtual galleries, video clips, sound, text, and photos provide with presentation of organized chunked information (schemas) the benefit of both visual and verbal characteristics in order to aid in the improvement of intellectual performance. The information presented using AV is easily understood and can be transferred and retained in the long-term memory directly, bypassing the working memory. The retaining of knowledge and skills learned is kept long enough and applied in various contexts including responding to examination questions which may significantly impact students' success in the topic under study.

1.9 Conceptual framework

Figure 1.1 below conceptualizes the relationship between the elements that are key to realizing the research outcome.

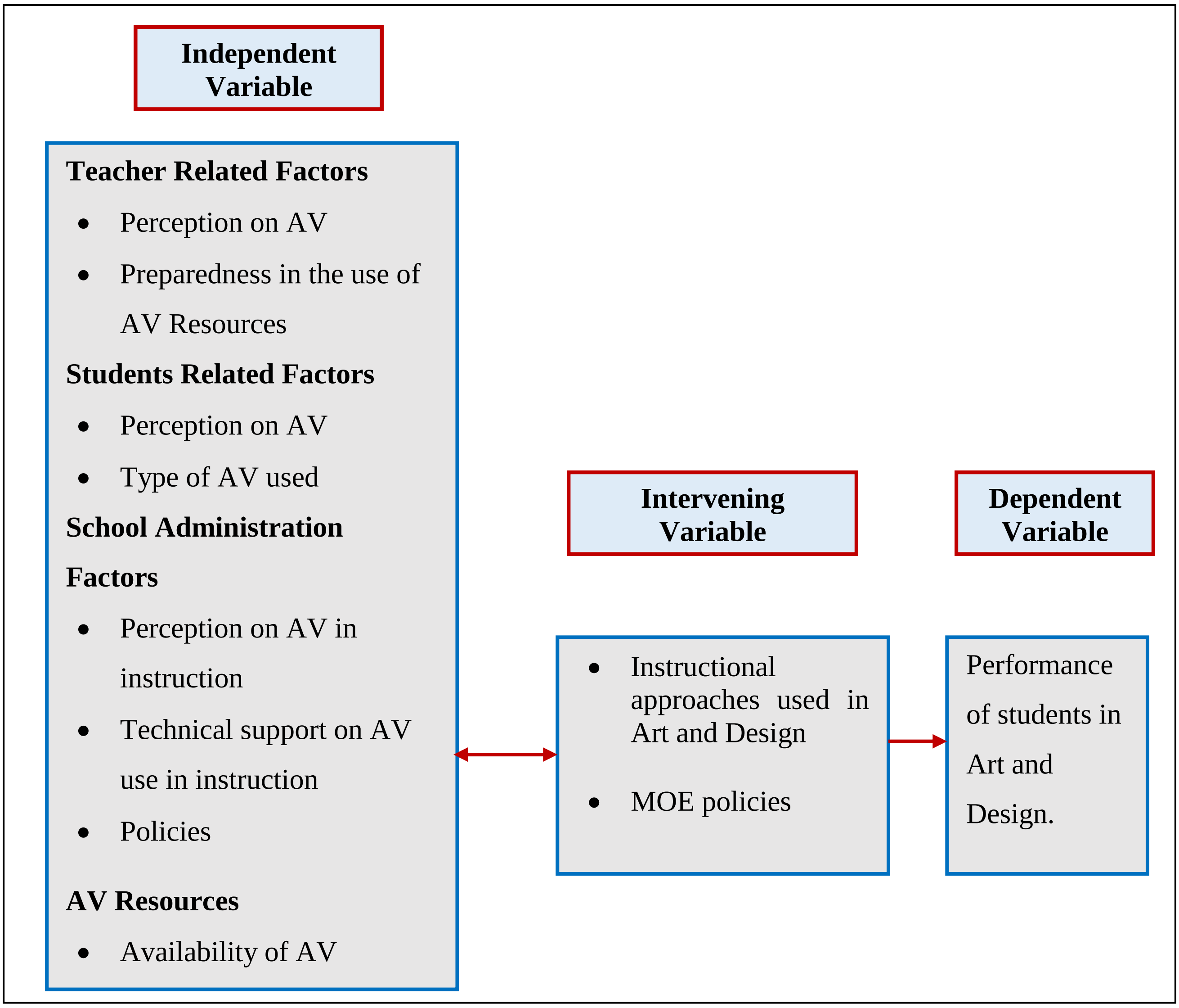


Figure 1.1: Conceptual Framework of the Study

Source: *Researcher's construct*

The above framework demonstrates the relationship between the independent, intervening, and dependent variables. The independent variables in this study are those whose variation does not depend on that of another, these are teacher, student, school factors, and AV resources. The intervening variables are those whose effects may affect the attainment of the dependent variable. The instruction methods and MOE policies are the intervening variables, use of the AV integrated method as recommended by MOE is presumed to affect the performance of students in AD which serves as the research's dependent variable.

1.10 Operational Definition of Terms

Art and Design: One of the elective subject taught in secondary school in Kenya that fosters personal expression, imagination, creativity, intellectual thinking, and the practical abilities to give form to ideas.

Audio Visual (AV): These are electronic media materials that possess both sound and visual components that are used in the teaching and learning process.

AV integration: refers adoption AV tools in the instruction processes in the classroom.

Conventional method: These are instructional approaches that do not integrate Audio Visual technology media.

Creativity: The use of imagination or original ideas to create something. The product need not be tangible; it could be a brand-new concept, problem-solving strategy, tool or technology, or even a brand-new way of thinking.

Performance: Degree of mastery as determined by the Art & Design test (ADT) following the teaching of specific concepts.

Technology: The theory and practice of creating, utilizing, managing, and evaluating instructional procedures and resources.

Influence: It is the ability to shape or change the achievement of learning outcome in AD.

Instructional processes: These are methods or activities used systematically in the teaching and learning of the AD subject.

Pedagogy: Refers to the method employed in the teaching and learning process which involves systematic and effective means to impact certain knowledge to learners.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter focuses on reviewing research work related to Audio Visual Resources used in the instruction of Art & Design, factors considered in the selection of the AV technology resources, extent of AV use in teaching and learning, their influence on students' academic performance in AD and establishing gender differences in AD academic performance when students are taught using Audio Visual resources.

2.2 Brief Background about Audio Visual Aids in Education

AV aids used as teaching and learning devices can be drawn from17th century. This was where John Amos Comenius (1592–1670), a Bohemian educator among others proposed a systematic method of AV education. He came up with a textbook *Orbis Sensualism Pictus* ('Picture of the Sensual World') published in 1658 that had over 150 picture drawings with each playing a significant task in instructing his lessons. Comenius idea gained popularity and was reinforced by other great instructors. John Locke, Jean-Jacques Rousseau, and J.H. Pestalozzi were among those who supported the use of sensory materials to communicate lesson information in an engrossing way that enhances the teaching process.

The use of AV resources gained popularity during the second world war when films, pictures, and other AV supplements proved to be very effective training resources for the U.S. armed forces, which spurred the momentum for using them in other applications including education. Since then, these resources have become a basic requirement in any lesson presentation because of their numerous advantages over ordinary methods. AV technology in education has gradually developed in sophistication from picture drawings, cassettes, and chalkboards to effective and efficient high-level AV aids as a result of new innovations in modern technology (Majumder,2019). The need cuts across all levels of learning from kindergarten to university and with the current technology, a variety of AV devices are present to cater for the divergent needs in the education landscape.

2.2.1 The concept of Audio-Visual Aids

According to Asma, (2015) gathered some scholars' definitions of AV resources: Edgar Dale; AVs are those devices used to aid multi-sensory learning of concepts during instructions. Mckown and Roberts (1949) argue that AV aids are is an enabler of instruction using more than one sensory channel. Therefore, AV aids as multi-sensory tool enables learning of concepts more clearly, firmly, coherently, vibrant and realistic.

In the context of this study, Audio Visual resources are those devices which have both sound and visual component or either the visual presentation only while the presenter provides the audio by speaking, which help to present an abstract concept in an easier way for learners to understand. Learning is made more effective, concrete, stirring, interesting and stunning. In the advanced digital era, education technology presents plenty of modern AV resources with software applications and internet in the modern classroom that enhance students' collaboration, blended learning environment, research-based learning, creativity, analytic, critical thinking, and skills necessary for problem-solving.

2.3 Rationale for Inclusion of AD Subject in the Kenyan Secondary School Curriculum

AD is a subject that embraces an overlapping and dynamic community of numerous areas in the academic field. The subject relates to other subjects such as communication and media, performing arts, the built environment, computing and information technology, engineering, and notably, architecture and design (Patera, 2009). Besides the subject having concepts that are key in many fields, it offers an opportunity for learners to develop 21st-century competencies such as imagination and creativity which are key ingredients to innovation which is essential to the industrial and socio-economic sector among others. These trends are contributing to an increased interest in the subject by students, and countries are restructuring their curriculum to offer Art and Design.

However, in developing countries, many are unaware of what the subject offers and its relevance to a country’s curriculum. Kinyua (2017), found out that K.C.S.E candidature for AD was very low and the subject was gradually being dropped by some secondary school. Moreover, she pointed out that a good number of national schools were offering AD and they were getting better administrative support compared to very few or no school in the county and extra county category offering the subject. Wagah et al (2009) also noted a trend since commencement of the 8-4-4 system of education in 1985 that there was a significant decline among secondary schools with AD as an examinable subject. Further, they concurred that the survival of the curriculum for the AD subject was at serious risk and also affirmed that science subjects were supported in terms of better facilities (laboratories) while AD facilities were in a deplorable situation. This situation means that very many students do not get an opportunity to pursue the subject and lack the know-how about its existence and relevance.

AD education is faced with significant issues including: lack of awareness of its contribution to 21st-century society, the need to attract and maintain students to pursue the area, primitive instruction pedagogy in face of the fast-changing trends in education technology. This study nonetheless affirms a noticeable scarcity of published research on education technology applications in AD thus carrying out this study is essential since it gives an insight on the importance of AD and how AV resources can aid the teaching and learning of this subject.

The *Education Business magazine* (2019) on business information for decision-makers in primary and secondary education –The significance of Art Craft and Design stated the significance of teaching it to learners included supporting personal, spiritual, social, moral, cultural, and creative development. It also helped learners how to recognize and express ideas and meanings within the perspective of formal education. Moreover, the subject has played a vital purpose at the Centre of Science, Technology, Engineering, and Mathematics; moving STEM into STEAM fostering creativity, innovation. Finally, experience in Art enables an individual to critically analyze things and situations to deduce valuable facts which enhances an individual critical thinking and decision-making ability.

Similarly, Kemoli (2018), alluded that AD is used to embody, preserve and appreciate societal culture, values, and history as well as promote a sense of belonging from one generation to another through its works. Moreover, African art styles are distinctive and would let people understand beauty and brightness of their African ancestry. Although in her research on it was realized that the target market applauded African art but not in very large quantities compared to the western content. She however proposed a solution to solve the situation by adopting a “best of both worlds” approach where the western content is mixed with African elements. This will see both cultures get an opportunity to be preserved, valued, and passed on to different generations.

AD also offers learners an opportunity to realize and nurture talents. A variety of areas covered in the subject such as drawing, painting, weaving, sculpture, and pottery among others in the secondary school curriculum are talent-based and focuses on skill accusation. In Kenya, the 8-4-4 curriculum is being faced out and replaced by the Competency Based Curriculum (CBC) whose mission acknowledges varied potential endowed in learners and therefore a broad curriculum will offer an opportunity to groom every learner’s potential thus creating room for Art education in the new dispensation (BECF,2018).

2.4 Types of Audio-Visual Resources in Instruction

In this era of digitization, a wider variety of AV aids that can be useful in all teaching domains are offered through hypermedia and the internet. Teaching and learning in the modern classroom have adopted digitally compliant AV tools such as computers, software, smart boards, video and power point presentations. These AV aids have impacted learners’ learning process either positively or negatively. Research argues that these depend on the selection and the level of utilization of the resources.

According to Asma (2015), study on “*impact of audiovisual aids to improve speaking skills*” the study classified AV aids as audio aids, visual aids and audiovisual aids, and activity aids. However, the study identified types of AV aids in the instruction of language, it was further carried out in a tertiary institution in Algeria. This study identified the type of AV resources in the instruction of a practical subject at an elementary level in Kenya. According to Ashaver (2013), study on the *Use of Audio Visual Material in the Teaching and Learning Processes* in Colleges of Education in Benue State-Nigeria classified AV resources that a teacher can use as Audio, Visual, and a combination of AV resources. Further the study pointed out that the common type of AV used in instruction were 'primitive' AV such as a chalkboard. This study established the type of AV resources used in the instruction of AD in Kakamega County, Kenya.

2.4.1 Use of Photographs with Sound to Teach AD

A Photograph is worth a thousand words through which a complex idea can be conveyed. Presenting concepts using moving digital photographic images with text or sound in a sequential manner demystify complex phenomena and aid to code information easily in the learner's mind. Photography has also been highlighted as a major aid in helping learners with associations and analogies. This is through known situations or subject photographs leading to understanding what is unknown. (Triacca,2017). A collection of photographs can be taken from natural sceneries, galleries, and others downloaded from the internet that is relevant and appropriate to the teaching and learning concepts, arranged and presented in a logical manner using the computer or projected to the class. There is a need of a wide exposure of learners to wider knowledge and varieties of painting works and sceneries that cannot be easily made accessible in the classroom, textbooks or teachers cannot demonstrate all necessary illustrations for the topic. Viewing the photographs steers their thinking and creativity thus broadening their scope of ideas in developing a painting composition.

2.4.2 Use of Internet and YouTube Videos to teach AD

Historically, AD teaching and learning involves studio-based learning and École des Beaux-Arts where the students observe and works alongside the master artist in the atelier. Teacher demonstrations are constrained by numerous things among them time and resources. These lesson demonstrations and other related content for the lesson can be packaged into videos which are found on the YouTube website. These video hosting sites viewable on computers or mobile phones provide AD teachers with an opportunity to take learners around the world. These enable the learners to listen to experts on various topics in AD, or follow an explanation for an idea or new concepts; hence bringing authentic examples in an AD lesson. The use of You-Tube videos provides students an opportunity to watch and research in real-time or as downloaded. These videos also encourage interactive participation. Dewitt et al (2013) carried out research on instruction of the performing arts using YouTube concurred that YouTube has the potential to be used as an instructional tool in the performing arts which agrees with current trends in education. Study also noted that, the video repository provides variety and up-to-date information better than what teachers offer in the traditional way. It also triggers creativity and innovation among the students. This means that, AD teachers and learners with online accessibility can embrace and utilize YouTube as an online AV resource to access to many teachings and learning content on painting. The research focus was on providing insights to AD teachers on how to utilize the available online repository which provides an atmosphere with plenty of resources for autonomous AD learning.

2.5 Importance of Audio-Visual Aids in Teaching and Learning

One key but challenging task experienced during the instruction process by teachers is finding appropriate means to improve their students' performance. Researchers in education technology have argued that it is almost impossible to find even a textbook that caters to the needs of all learners. Traditionally, majority of teachers employ the talk-chalk method supplemented with textbooks but learners' needs are mutating with the dynamic society we are in. However, the conventional method can be supplemented with suitable AV aids which offer a rich multiplicity of sensory experiences to reinforce the books. Singh, C. K. S. (2021) assert that utilization of AV aids enables the development of reading interest among learners, creates authentic communication between the text and the reader hence reading becomes more active and faster. However, this study was limited to the English language. This study explored the significance of audiovisual use within the context of teaching and learning Art and Design.

In India, Tang and Intai (2018) affirmed the remarkable advantages of AV resources: enhanced acquisition of knowledge as well as ensuring longer retention of the knowledge acquired, AV aids help in presenting abstract knowledge to learners in different ways which enhances the clarity of communication. Further, identified AV as means to increase the speed of comprehension thus saving time and energy, motivating and stimulating learners' ability to seek more knowledge, and ultimately catering every individual differences. The study was limited to science and was done in Malaysia; therefore, this study found out how AV aids can be useful in teaching Art and Design in Kenya.

Utilization of Audio-Visual resources in instruction improves learners' performance academically. In agreement with this statement, Situma (2016) in his study in Kenya blamed the poor performance of students in Christian Religious Education in Bungoma county, Kenya on the non-use of AV resources by teachers over the years. Therefore, this study sought to investigate whether there is a correlation between the utilization of AV resources in instruction and learners' academic performance in AD.

2.6 Policies and their Influence on Audio Visual Technology Use in Teaching and Learning

Education policy is a key factor to consider when selecting AV aids to use. Omariba et al., (2016) study pointed out that the MOE policy on ICT integration into education and training in Kenya by 2010 aimed at providing sufficient and affordable internet infrastructure capacity to all secondary schools and tertiary institutions. Moreover, the national needs assessment report 2012 which aimed at actualizing the reforms in education whose report gives the guideline of the CBC stipulates deliberate policies on appropriate pedagogical approaches and utilization of ICT as a teaching tool, BECF (2018). These policies define the practices that take place in the classroom as well as provide an enabling environment for the successful adoption of the practices. Teachers are expected to use AV resources that are current in order to ensure quality instruction. Therefore, the study found it important to find out if secondary schools in Kakamega county are compliant with these emerging MOE policies in the choice of AV technologies to use in the instruction process.

Eaton (2018) research study on the trends in Language in the 21st Century aimed at answering one key question in her research that was stated as follows: *"What trends are occurring in education in both developed and developing nations, at the* *primary, secondary, and tertiary levels, as well as in adult education regardless of whether the education is public or private, on every continent of the world?"* the key among the seven trends pointed out is technology use and integration which is elaborated the as use of technological tools to aid the instruction methods so as to enhance learning and obtain desired learning objectives. The new trends are crusaded as policies by many education scholars, Media, and education stakeholders in various countries across the world which teachers are bounded to follow. This study ventured to find out whether AD teachers in Kakamega County, Kenya adopted new trends and policies on instruction using digital AV technologies.

2.7 Extent of AV Use in Teaching and Learning

Utilization of AV aids in the classroom has been a key practice that is still to be actualized in the classrooms. According to Muteheli (2017), findings, many public schools had a variety of AV media such as computers. However, these media were not used for the instruction process because of some constraints which included; lack of electricity, teachers' heavy workloads or teachers' unwillingness to prepare or use media because they are time-consuming, inadequate training on the use of various instruction media, scarcity of funds for the acquisition of some media, teachers focusing on making students achievement in exam rather than refining their instruction method and finally, the training teachers underwent was more theoretical therefore they assumed that the norm in the instruction practices. The study locale was Bungoma county and the subject of study was English language, this study is done in Kakamega county and in AD subject. Moreover, Kinyua (2017) secondary teachers avoid the use of computer instruction to teach graphic design because of the Low level of computer literacy. This leads teachers to confine to conventional and traditional instructional strategies. The study was limited to computer programs to teach graphic design therefore, this study established the extent of AV resources used in teaching painting topics in AD specifically in Kakamega County.

2.8 Influence of AV resources on Students' Academic Performance.

Literature on the effect of AV resources on learners' achievement has shown and continues to reveal varying findings. For instance, Tang and Intai (2018) carried out a study involving 30 students in Malaysia on the impact of AV material application on secondary school learners' achievement in science. The analysis of data was done using Pearson correlation and ANOVA. The study found that learners who were taught with Audio Visual instructional resources demonstrated a statistically significant improvement in their scores than the control group taught with the traditional conventional instructional methods of instructions. However, the study did not indicate the factors to consider when selecting suitable Audio Visuals for instruction in the classroom. The focus of the study was on science and not AD.

Ibe and Abamuche (2019) also carried out a survey in Nigeria involving 150 students on the impact of AVs learners' achievement in Biology. The research applied a quasi-experiment study design and the findings discovered that the treatment group taught with AV resources scored higher marks than the control group taught with traditional methods of instructions. However, the study did not indicate the challenges teachers face when teaching with AV resources.

Badalova, B. (2021).

Asma, (2015) study on how the utilization of audiovisual aids improves learners' speaking skill in Algeria. The study hypothesized that if the teachers use AV materials in the classroom, students' speaking will be improved. The researcher sampled forty 3rd year students and Five teachers and used three data collection tools (questionnaire, interview, and classroom observation) was used to investigate the truthfulness of this hypothesis. Consequently, the results indicated that 67.5% of the students preferred Audio Visual aids over Audio and Visual and the hypothesis was confirmed that1the adoption of AV resources in1the teaching process truly improved the students' speaking. However, the study did not test the hypotheses and was limited to university language students. This study, therefore, finds a gap to fill where pre and post-tests were research tools used to give data for hypothesis testing in order to establish if there statistically significant difference in academic achievement and this will be done in Art & Design.

Sikudhani (2016) carried out a case study on the influence of instructional aids on learners' academic performance in secondary schools ın Mtwara region in Tanzania. A few schools were randomly selected and teacher, head teachers, students and education officials were involved. Data was collected through questionnaires, interviews, documentary reviews, and observation guides. Both quantitative and qualitative methods of data analysis were used. Findings indicated that proper utilization and availability of teaching and learning materials impact students' academic performance positively. However, the study was in Tanzania and general to all teaching and learning resources. This study was done in Kenya and narrow down to AV technologies only.

In Kenya, much research has been carried out around this area. Makokha, (2017) Pointed out in her research that English teachers in Butere sub-county underutilized AV instruction aids in the teaching of oral literature. They only used the text and board. She recommended that teacher's effectiveness with regard to the utilization of

AV resources in teaching and learning oral literature will enhance performance in English paper 2. Muteheli, (2017) carried out a survey and established that there were different types of media such as computers, newspapers, television, and dioramas among others in schools but teachers mostly used textbooks and chalkboards. She recommended that teachers should be encouraged to plan lessons that integrate media and teach using a variety of media in order to make learning more meaningful and interesting to students. The two studies were carried out in the teaching of English and one was in Bungoma county while the other one sampled one sub-county in Kakamega county. This study bridged the gap by carrying its research on schools in Kakamega County that offer Art& Design.

2.9 Gender Difference in Academic performance of students when taught using AV resources

The impact of AV resources on students' academic achievement across a range of topics has been the subject of numerous studies among them include, (Tang and Intai ,2018; Asma, 2015; Sion, 2014) without considering gender influence on performance when learners are taught with an AV integrated lesson. The glaring gap in AV literature in AD subject and examining the AV integrated lesson effect on performance in terms of gender is what this study has addressed.

Ibe and Abamuche, (2019) studied on effects of audiovisual technological aids on students' achievement and interest in Biology in secondary school in Nigeria sort to establish if there was any gender influence on Biology performance when AV resources are utilized in class. The study adopted quasi-experiment research method of the non-equivalent control group design. 150 senior secondary two (SS2) learners of two intact classes randomly selected from two schools were assigned one to experimental and other to control. The post-test scores of the experiment group were categorized and statistically analyzed in terms of gender to confirm the study's null hypothesis (Ho_3): "*There is no significant difference between the mean achievement scores of male and female students in Biology*". The study confirmed that there was no significant difference between the mean achievement scores of male and female students in Biology when taught using AV resources. The study was done in Biology and descriptive statistics was used to confirm the hypothesis. This study addressed the literature gap by finding out gender differences in the performance of AD when students are taught using AV resources and the statistical tool used was an independent t-test.

2.10 Summary of gaps in the existing literature

Related literature reviewed has shown that AV aids have been used for many years, however changing learners' needs in society informs the adoption of new AV technologies that are relevant in a modern classroom. Studies also established that AD subject is very key in the provision of the much needed 21st-century skills, therefore, need for the adoption of refined instruction strategies that integrate AV technologies (Kinyua, 2017; Knight, 2014; Patera, 2009; Sions, 2014). However, there is clear evidence from reviewed literature that the majority of these studies were done in developed countries in the USA and Europe. Generalization of findings of such research in a third-world country like Kenya may lead to erroneous conclusions hence a notable gap in this area of study.

There is extensive research on AV resources specifically computer-aided instruction, teachers' and learners' perception of the utilization of AV technologies in instruction, and the effect of the AV tools on learners' performance majorly in languages, sciences, and social science (Makokha, 2017; Tairu Idris, 2018). However, there were very limited studies published on AD subject, practices in the instruction of AD, and the influence of AV resources on the performance of AD in Kenya. Nevertheless, studies done in AD instruction there is none on the use of AV tools in the instruction of painting concepts, hence a glaring gap that this study addresses.

Reviewed literature has also pointed out that the utilization of AV in instructional settings contributes positively to learners' academic performance in STEM subjects. The study, therefore, intended to determine whether there has been statistically significant improvement in the academic performance of students when taught using AV technology resources in AD and the other three objectives that directed this study which was not articulated in any other study.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter focuses on the adopted research design. It also discusses the locale, target population, sample size and sampling procedures, research instruments, pilot study, validity and reliability of the study instrument. Data collection procedures, analysis techniques, and the research study's logistical and ethical considerations are also discussed.

3.2 Research Methodology

This study utilized the mixed method that combines both qualitative and quantitative data with an intention to enhance the scope of fetching the data in terms of the breadth and depth.

3.2.1 Design of the Research

The study adopted a quasi-experiment of the Solomon four non-equivalent control group. The study design was appropriate because it examined the possible cause-and-effect relationship by manipulating one independent variable to influence the dependent variable in the experimental group and measuring the effects of the manipulation using statistical methods. The design was adopted since it lacks random assignment of participants to conditions or orders of conditions that enable the study to constitute the control and experiment group which are dissimilar in some ways (White & Sabbarwal 2014).

All groups were exposed to a pre-test before an intervention and the treatment of a variable was given to the experiment group. Finally, all the groups were exposed to a post-test examination. Test score results of the groups were used to confirm or reject a hypothesis in order to prove if there is any statistically significant difference. The statistically proven difference in the two groups concluded that the effect of the treatment caused this difference (Cook& Campbell,2002).

Table 3.1: Research Design

Groups	**Pre-Test**	**Treatment**	**Post-Test**
Experimental Group	O_1	X	O_3
Control Group	O_2	X_1	O_4

Figure 13.1: Solomon-four group, non-equivalent control group design.

Key:

X ***- Treatment***

X_1 ***- No Treatment***

The two sets of groups were from different schools to avoid effects of experimental contamination. This design was suitable because the scores obtained from the pre-test and post-test were analyzed to determine if there were any statistically significant differences in performance before and after the test to ascertain the influence of AV resources on the student's performance in AD.

3.3 Location of the Study

Kakamega County in the western part of Kenya was the locale of the research. It is one of the most populated counties with a homogeneous population (KNBS,2019). It constitutes 13 sub-counties namely: Kakamega Central, Kakamega North, Kakamega south, Kakamega East, Matungu, Navakholo, Matete, Butere, Likuyani, Lugari, Khwisero, Mumias west, and Mumias East. In the education sector, the county has a majority of secondary schools that are government sponsored which totals up to 384 (CEO,2019). In KSCE 2019, the county registered low performance with an overall mean of 4. 06827 with the performance of AD in KCSE registered in the last 5 years not outstanding but rather average and some schools recorded a mean of as low as 1.920. This county is one of the few counties with the highest number of schools that offer Art and Design as a subject in the country. It is also where the sample schools for the study are geographically located. All these factors put together informed the final choice of Kakamega County as the location to carry out this study.

3.4 Target Population

Targeted group consisted of four secondary school principals, four Art and Design teachers, and sixty form two AD students from public secondary schools. The school principals were ideal because they gave an insight into the administrative factors influencing the use of AV use in classroom instruction while Art and Design teachers were also suitable respondents because they are the instructors of the subject. Further, form two students were selected because they had acquired essential skills in the subject and also this exposure will have a positive influence on their choice of AD subject as their elective as they proceed to form three. Form three students besides having acquired essential skills in the subject, the number of students who had selected the subject was already very low with some school having less than five students. This number would not have been an ideal representation to satisfied this study’s objectives. Form Four students were also left out of this study since they were already done with the coverage of syllabus and were preparing for their KCSE exams while the form one students had not had enough exposure to the subject.

3.5 Sampling technique and sample size

3.5.1 Schools

According to Kakamega CEO (2019) report indicate that there are approximately 385 registered secondary schools. Out of these numbers, only 16 secondary schools located in 8 out of the total 13 sub-counties in the whole county had schools that offered Art and Design. Two schools out of the 16 were not part of the selection because one was privately sponsored while the other one was a special school for the deaf. The 14 schools that participated were purposively selected, as to meet the study objectives. These public secondary schools were grouped as sub-county, county, extra county and national schools (MOE, 2010). Therefore, the 14 selected schools were stratified accordingly and then randomly sampled the two extra county and two national secondary schools with homogeneous characteristic to representing 25% of the participant in the study. Cohen, Manion, and Morrison (2011), affirmed that when working with a smaller population, a sample of 20 to 30% is acceptable.

School A and C were national and constituted the experimental group where the intervention (Audio Visual resource use in instruction) was applied. Schools B and D were both extra county which comprised the control group where learners were taught using the conventional instruction method.

3.5 2 Sampling of Students

Enrollment of secondary school students who take AD subject is often low. For instance, the total number of KCSE examination candidates in 2019, 2018, and 2017 was 184, 178, and 176 respectively in Kakamega county. Data from the county education office of Kakamega indicate that, 2019 KCSE candidature in AD subject per school were as low as one in some school and the highest registering approximately fifteen students. This indicated that each class cohort in the sampled schools was most likely to have few students. Therefore, purposive sampling method was adapted to all students taking AD subjects in the four sampled schools.

3.5.3 Teachers Sampling

All the schools that offered Art and Design in the county were staffed with only one AD teacher handling the subject in all the classes (CD-TSC Kakamega). Due to this factor, four teachers were also purposively sampled to participate in the study. They constituted 25% of the total number of AD teachers present in the county.

3.5.4 School Heads

Purposive sampling was employed to select 4 school heads where one from each of the 4 sampled schools took part in the interview. These people by their status are better placed to provide credible information on the issues under study. This interview assisted the researcher to solicit substantive information on key issues that required further clarification from this category of informants who are deemed appropriate by virtue of the positions they occupy. The summary of the sample distribution was as displayed in Table 3.2.

Table3. 2: Sampling Matrix of Participants for the Study

Schools/Level	School	Principals	Teachers	Students
National	A (EG1)	1	1	15
Extra county	B (EG2)	1	1	17
National	C (CG1)	1	1	14
Extra county	D (CG2)	1	1	13

source: *unpublished education report for Kakamega county*.

3.6 Research Instruments

Data was collected from both primary and secondary sources. There were four data collection instruments which included; a checklist, questionnaire, tests, and an interview.

3.6.1 Interviews

This was an oral administration of questions from the interviewer(researcher) to the interviewee (principals) intending to elicit information or opinions. It was used in order to obtain in-depth information and fulfill all the objectives of the study. The interview guide was semi-structured with some questions structured, and others open-ended. It was used on two principals from the sampled schools, who were available and consented to the interview. The researcher got information on school administration related factors influencing the type of AV available for AD instruction and utilization of AV resources in teaching AD in the school.

3.6.2 Questionnaires

The questionnaires were administered to collect both qualitative and quantitative data collected from the Art and Design teachers. Questionnaires were suitable since they allowed the researcher to give meaning to ambiguous items (Mugenda and Mugenda,2013). The questionnaire consisted of two parts as follows: biographical information, section part structured question for teachers to identify type of AV available, a list of AV resources to gauge their level of utilization of AV resources using Likert scale: Very Frequent (VF), Frequently (F), Occasionally (O), Rarely (R), and Never (N)). Creswell (2012), pointed out that Likert scale are matrix that share the same set of response categories and are easier to complete, thus ideal for this context. The last item on the second section was an open-ended question to gather any useful information on AV resources such as challenges they may be experiencing and their possible solution.

3.6.3 Checklist

The checklist aided the researcher to obtain first-hand information on various types of AV aid resources available for AD instruction in the sampled schools. This served as a triangulating tool to enhance the validity of the data obtained from the teacher's questionnaires and the principal's interviews.

3.6.4 Art and Design Test (ADT)

This was a crucial instrument for data collection for this study because it was used to collect data on students' performance in AD and specific areas which included (creativity, subject matter interpretation, creating forms, and media application) for the pre test and post-test scores. The scores were statistically used to prove all the hypotheses. The two sets of the AD test examined the topic of painting which constituted two sections; Section one had theoretical questions on painting while section two had a practical question on painting with a total score of 30 and 50 marks respectively. The test questions were drawn from KSCE's past year's questions on the area of study as guided by the syllabus. The researcher also used a blueprint table on blooms taxonomy so that it can test levels of the cognitive domain of the learner (Wilson,2016). This enhanced the construct validity of the AD test.

The experimental and control groups were exposed to pre-test to confirm learners' potential in painting in terms of knowledge and artistic painting skills before exposure to the treatment. After using the AV technology-aided instruction on the experiment group a post-test was given to all the groups to get students' performance in Art and Design and obtain scores that were analyzed statistically to answer the main purpose of the study.

3.7 Pilot study

Piloting was done to confirm the validity and reliability of research instruments as well as familiarize the researcher with data collection procedures. Two school in the county constituting an extra county boys' school and a county school which is a mixed school, and were not part of the sampled schools for the actual study were used for piloting. The pilot study findings supported the researcher to fine-tune research instruments accordingly. Ambiguous questions were reframed and those that seemed irrelevant were removed altogether.

3.7.1 Validity of the Instruments

The scope to which research analysis results accurately reflect the study's variables is referred to as validity (Mugenda & Mugenda,2012). If a data collection instrument accurately measures what it ought to measure it is considered valid. The research instrument's validity was enhanced through appraisal and review by the supervisors. The pre-test and post-test instrument for AD was adopted from the previous year's KCSE of 2017 to 2019. This was in consultation with the experienced teachers of AD in secondary schools. Further to ensure validity, a triangulation approach was used where the study used more than one instrument to gather the same data. The study instruments corresponded to each other in the data collection process.

3.7.2 Reliability of the instruments

The extent to which a research instrument is consistent with the same results is referred to as reliability. The researcher uses reliability test results to identify ambiguities and inadequate items in the research instruments. According to Orodho (2005) if scores obtained from each respondent in two tests are identical or quite close, the measuring instrument is perceived reliable. This study employed the test-retest method where the instruments were given to the pilot groups. The pilot group had almost similar characteristics to the study group. Test items were issued and repeated after a two weeks interval. The scores correlation coefficient was determined as a reliability coefficient. The reliability of 0.5 was accepted as a reliable measure in this study. In spearman's rank correlation coefficient, in the event that the correlation score falls at an average of 0.5, it is certain that the instruments were reliable to correct the intended data in this study.

3.8 Data collection procedures

The researcher sought a permit from NACOSTI before visiting sampled schools. Then, the Researcher visited sample schools prior to the actual study. This helped in getting consent from the school administration, and created rapport between the researcher and the respondents. Also, the researcher was able to make appropriate appointments and arrangements in order to avoid inconveniences during actual data collection. The researcher carried out an interview with the principals. The interview focused on the administrative support and policies established in the school to support the use of Audio-Visual technologies use in the instruction of AD. After the interview, the teacher's questionnaire was administered. This was later followed by a pre-test for the learners. The post-test was then administered after the treatment.

3.9 Methods of Data Analysis

Analyses of data refers to the process of examining, making deductions and inferences on the collected data. Data collected in this study was both qualitative and quantitative. The main data collection items were: two AD tests, teacher's questionnaires, interview for the principals, and the checklist.

Data was keyed in the computer and required reports were generated through Statistical Package for Social Sciences (SPSS). Descriptive statistics for both experimental and control groups were generated. This enabled the researcher to determine which group had performed better academically than the other. The significant difference was tested through paired T-test. For evaluating the significance of a sample mean, a T-test is deemed appropriate Kothari (2004).

Qualitative data from questionnaires and interviews were first summarized in themes. This was done by formulating detailed descriptions and coding them to organize the themes and also presented them through narrations. The following Table 3.3 presents a summary of the objectives of the study, the type of data collected, the source of data, the instrument used and, the data analysis technique used in the study.

Table 3.3: Data Analysis Matrix

Objectives	**Type of Data**	**Instrument for Data Collection**	**Data Analysis Techniques**
Establish the types of AV resources used in the instruction of AD.	Qualitative Quantitaive	• Questionnaires • Interviews • Checklist	• Frequencies • Descriptive • Percentages, mean and standard deviation
Find out the extent to which AV resources were used in the instruction of AD.	Qualitative	• Observation • Checklist	• Frequencies • Percentages, mean and standard deviation
Assess the effect of AV resources on the performance of students in AD.	Quantitative	• Pre-test • Post-test	• T-test
Establish gender differences in AD academic performance when students are taught using AV resources.	Quantitative	• Pre-test • Post-test	• T-test

3.10 Ethical and Logistical Considerations

Research authorization was acquired from the graduate school of Kenyatta University by the researcher. The authorization was used to seek a permit to carry out research from the National Commission for Science Technology and Innovation (NACOSTI). The researcher then requested consent from the County Education Office in Kakamega and from the principals of the selected secondary schools in order to pilot and collect data.

Participant rights were respected throughout the study. There was no coercing of the respondents to give any information. It was ensured that the study did not cause any physical, emotional, psychological, or religious harm to the participant. The data collected was handled with utmost confidentiality and was used for this study only. The research used anonymization to conceal the identity of all the participants.

CHAPTER FOUR

PRESENTATION, INTERPRETATIONS, AND DISCUSSION OF FINDINGS

4.1 Introduction

The aim of this study was to assess AV resources and their influence on the academic performance of learners in Art & Design. The study was conducted in public secondary schools within Kakamega County in Kenya . Data was collected from four main sources namely; school repository, AD teachers, students, and school heads from the sampled Schools. The findings, interpretations, and discussions according to the objectives, research questions, and hypothesis formulated to guide the study are presented in this chapter. Tables and graphical methods are used to present the findings and their interpretation is thereafter discussed. The Chi-square independence test and t-test were the main inferential statistics used to test the null hypothesis of the study. The study's objective for this research were as follows:

- Establish the type of Audio-Visual resources used in the instruction of Art and Design.
- Find out the extent to which Audio-Visual resources were used in the instruction of Art and Design.
- Assess the influence of Audio-Visual resources of the performance of students in Art and Design.
- Establish gender differences in Art and Design academic performance when students are taught using AV resources.

4.2 Demographic Information

The return rates of the data collecting instruments administered to the study participants and the informants' demographic details included; their age, qualification, gender, experience, and location of secondary schools are captured. This was to help the researcher check for regularity of the data gathered based on the number and representation of informants per group and gender because the data was collected from intact groups

4.2.1 Proportions of Groups of the Respondents

Four groups were involved in the study, two of which were experimental and the other two were control groups. Sixty students participated in the study where fifteen were participants in Experimental Group 1 (EG1) and fourteen were for Experimental Group 2 (EG 2). Seventeen and thirteen were participants of Control group 1 (CG1) and (CG2) correspondingly. Frequency and percentage of the respondents in each group were calculated and the results were represented in form of a Pie-chart as shown in

Figure 4.1

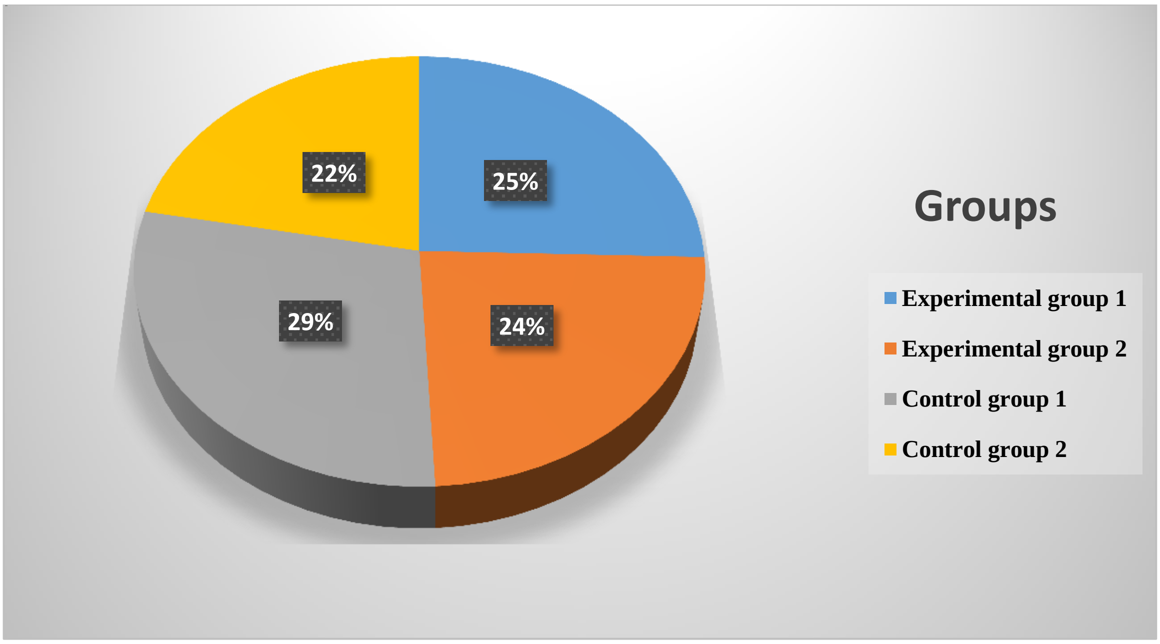


Figure 4.1: Proportion of the Respondent Groups

Figure 4.1 reveal that 25% of the participant constituted EG1, 24 % were members of EG2, 29% were members of CG 1 and 22% were CG 2 members. The findings indicated that; the proportion of respondents in each group was roughly equal. This, therefore showed that the intact groups which were involved in the study were proportionately represented which makes it possible to make an unbiased comparison between the groups using statistical tests.

4.2.2 Gender of student Respondents

This study included two male and two female' learners' public secondary schools. The number of the participants based on gender was calculated and the proportions expressed in percent. Their proportionality was represented by use of a pie chart as shown in Figure 4.2.

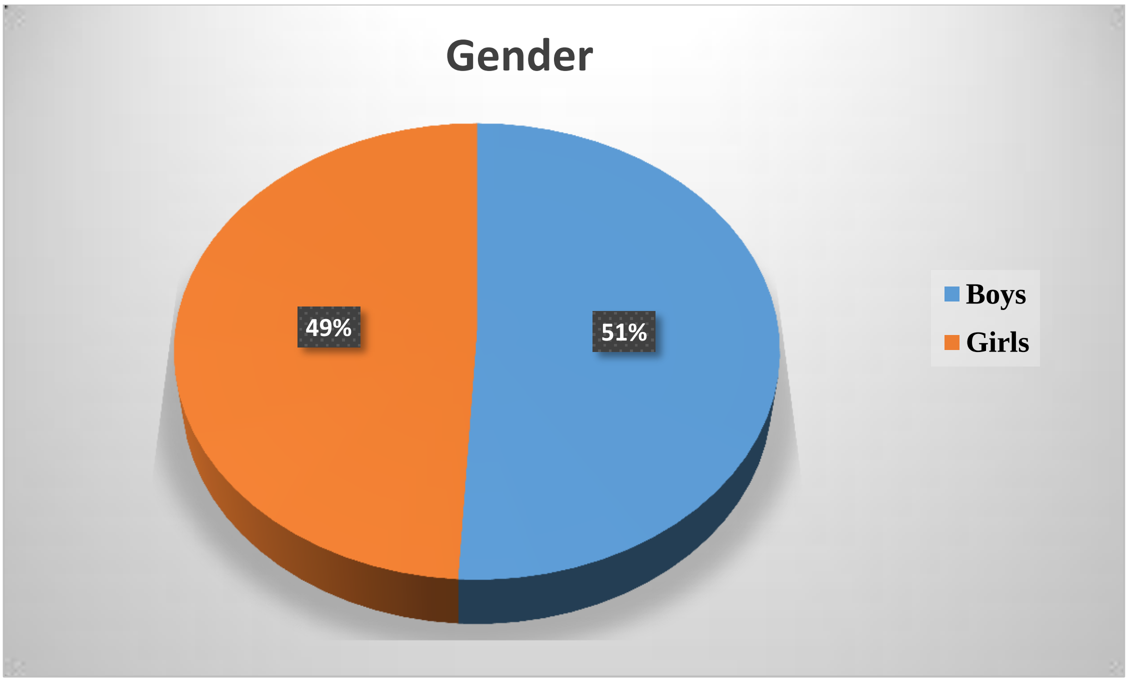


Figure 4.2: Proportion of Respondents by Gender

From Figure 4.2, it is evident that the number of male (Boys) and female (Girls) learners involved in the study was almost equal, with boys being slightly more. This shows that the sample was equally distributed across the gender. Thus, there was a minimal gender difference in the participation in this study. The reason why the boys' samples were slightly higher than girls' is that AD is an elective subject and it is more popular with the boys than girls. Therefore, the groups had similar and comparable characteristics in terms of the number of participations, hence homogenous representation.

4.2.3 Teachers Demographic Data

The demographic data of the teachers was gender, age category and level of qualification. Table 4.1 below shows the results.

Table 4.1: Gender Distribution of AD Teachers

Gender	Number
Male	1
Female	3

From the above Table 4.1 The total number of AD teachers involved in the study were four. All selected schools had one AD teacher each with three teachers being female while one was male. This result shows that majority of the teachers teaching AD are female. The male teacher was in a boy school, one female teacher in a boy’s school while the two other girl’s schools had female teachers. For the age categories, the results were as shown in Table 4.2

Table 4. 2: Age Category for Art and Design Teachers in Sampled School

Age Category	Below 25	26-30	31-35	36-40	41-45	46-50	51-55	56-40
Frequency	0	0	1	1	0	2	0	0

Table 4.2 above shows that there was one teacher of 31-35 and 36-40 years. Two were 46-50 years. This finding shows that the majority of AD teacher age were in the 46-50 years category, very few of them in the age category of 31-35 and 36-40. Therefore, this finding indicates that pre-service AD teachers who graduated to teach AD were taking a while to be recruited in the public school because new graduates are in the 29 years and below age category. For the level of qualification, the findings were as shown in Table 4.3.

Table 4.3: Art and Design Teachers' Academic Qualifications

Level of Qualification	Frequency
Post-Graduate Degree	0
Degree	3
Diploma	1
Untrained	0

Table 4.3 shows that three teachers were holders of a degree certificate and one had a diploma. There was none of the teachers had either post graduate training or had no training at all in the subject. The finding shows that teachers teaching AD had acquired professional credentials as required by the TSC to teach in secondary schools. Therefore, its presumed that this high level of professional qualification would enable them to adopt appropriate pedagogy that integrates use of AV resources to improve the learning outcomes of all students.

4.3 Audio Visual resources used in the instruction of AD

Audio visual resources are applied in all domains in teaching AD. First, objective of the study sought to establish the types of AV resources utilized during the instruction of ADs. The findings for AV resource are represented in Table 4.4.

Table 4.4: Audio Visual Resources Distribution in All Groups

	EG1	EG2	CG1	CG2	Totals
Desktop	0	8	1	0	9
You-Tube Videos	20	15	0	5	40
Educational videos	14	10	0	0	24
LCD Projector	2	1	1	1	5
Smart board	1	0	0	0	1
Laptops	2	1	0	0	3
Digital Cameras	0	1	0	0	1
Television	0	1	0	0	1
Smart Phone	1	1	1	0	3

The Table 4.4 Shows that the most available AV resources are You-Tube (40), educational videos (24), desktops (9), LCD Projector (5), smartboard (1), laptops & smartphones (3), digital camera and television (1). AV resources were more available in experimental groups than in control groups. The findings implied that the majority of schools had limited audio-visual resources available. It was also notable that the majority of the audio-visual resources available in the schools such as computers, LCD projector, laptops, digital cameras, and smart phones were found in the ICT laboratories and not designed for AD instruction but for multi-purpose use in the school. Art teachers and students used them for teaching and learning on need basis only, unlike the science and language subjects that had been allocated permanently resources such as laptops, digital cameras, and a smart board. The researcher also established that You-Tube videos were available and utilized in most of the selected schools except one of the control groups. This was attributed to internet connectivity in the schools and teacher efforts to embrace new trends in education technology in order to meet varied teaching and learning needs in AD.

This finding agrees with Wawuda (2019) study who noted that a majority of teachers (83.3%) had integrated videos from YouTube in the teaching of English language speaking skills. Dewitt et al. (2013) study on the instruction of the Performing Arts using YouTube had agreeing findings with this study, that YouTube has the potential to be adopted as a tool for instruction in the Performing Arts in line with current trends in education. They also noted that the video repository provides variety and up to date information better than what teachers offer in the traditional way. This trend was found vital in the teaching of painting topic since it enables learners to access wider knowledge beyond the textbook and teacher's demonstration which enhances understanding of the concept better.

For the Audio resources available the results are presented in Table 4.5.

Table 4.5: Audio resources distribution in all groups

	EG1	EG2	CG1	CG2	Totals
Radio	1	1	0	0	2
Tape Recorder	0	0	0	0	0

Table 4.5 shows that, there were only two radio resources which were in experimental groups only. Tape recorder was not available in all the groups. This implies that audio resources were not a popular type of instructional resources for

AD. The two radios for the experimental groups were underutilized during AD lessons. Tape recorders for learning were unavailable because they found them to be an outdated type of audio technology resources. This concurred with Mwakapina (2016), the study acknowledges that efficient high-level AV aids as a result of new innovation in modern technology are more preferred by the current generation of students as well as teachers.

For the print resources available, the findings are shown in Table 4.6. below.

Table 4. 6: Print Resources Distribution in All Group

	EG1	EG2	CG1	CG2	Totals
Text Book	30	20	15	30	95
Photographs	24	15	4	0	43
Posters	8	10	0	4	22
Charts	0	20	4	0	20

Table 4.6 shows that the most available print resource is textbook (95), Photographs (43), Posters (22) and Charts (20). This implies that print resources were a common type of instruction resource available in all schools. They were easily accessible and a majority of AD teachers and students were familiar with print resources. Textbooks were the basic print resources that were highly dependent during the instruction of AD lessons by teachers in the control group. The researcher observed that learners from the experimental group were taught through a collection of printed and motion photographs taken from relevant scenery related to the painting concept (atmospheric perspective) being taught which enhanced their understanding of the concept. This influenced students to make bold choices of colour and appropriately created value using colour in their paintings. These results were same

as what Triacca (2017) whose research on teaching and learning with pictures in primary school noted that photographs helped to simplify concepts and made learning easier.

For 2- and 3-Dimensional visual display resources, the study findings were as shown in Table 4.7

Table 4.7: Two and Three-Dimension Visual Display Resources Distribution in All Group

	EG1	EG2	CG1	CG2	Totals
Boards	1	1	1	1	4
Models	0	5	0	0	5

Table 4.7 showed that the chalk/white boards were available in all groups while models were only in the experimental group 2. This implied that boards were the traditional AV resources that were used regularly, this was highly attributed to the conventional talk and chalk method that was a notable common practice in the teaching of AD. These resources were also popularly used because they do not need any sophisticated technological knowledge for one to use them. Moreover, most teachers found it to be the 'normal norm' since the practice dominated in the teaching of other subjects in the school. Also, they found them to be cost effective because they did not need complimenting resources such as power and internet. It was observed that learners were less excited and creative while being taught using these resources. This finding concurred with Bariham (2019), study on the utilization of AV resources in the process of teaching and learning in Colleges of Education in Benue State-Nigeria noted that the common type of AV used in classroom instruction was 'primitive' AV such chalkboard.

For the access to the internet, findings presented in below in table 4.8.

Table 4.8: Internet Access

	EG1	EG2	CG1	CG2
Internet	A	A	NA	A

Key: A –Available, NA-Not Available

Table 4.8 shows that; only control group one had no internet access. Other groups were able to access the internet. This means that the majority of schools had internet connection which compliments AV resources such as laptops and smartphones making them more resourceful. The research found out that, schools strived to have access to the internet at their own cost though endured the challenge of subscription charges to keep the service running. This was highly necessitated by numerous MOE, KNEC, and TSC online services such as student examination registration, and teacher's appraisal reports among others that teachers must adhere to.

4.4 Extent of Utilization and Challenges Facing Integration of AV Resources in instruction of AD

The second objective of this research sort to find out the extent to which AV resources are used in the instruction of AD. This study has discussed this objective in the following sub-themes.

4.4.1 Extent of Utilization of AV-Resource

This was measured by how frequently the AD Teachers utilize AV resources per term. The data was collected using Teachers' Questionnaire part two item numbers (ii) and (iii) and the school principal's interview. The teachers were to gauge their level of utilization of AV resources using Likert Scale (Very Frequent (**VF**), Frequently (**F**), Occasionally (**O**), Rarely(**R**), and Never (**N**)). The Findings for visual resources were as shown in Table 4.9.

Table 4. 9: Utilization of Visual Resources

	Percentage Frequency				
	VF	**F**	**O**	**R**	**N**
Desktop	0	25	0	25	50
You-Tube Videos	25	25	0	25	25
Educational videos	0	25	25	25	50
LCD Projector	0	25	25	50	0
Laptops	0	25	25	0	50
Cartoon	0	25	25	0	50
Digital Cameras	0	0	25	0	75
Television	0	0	0	25	75
Smart Phone	0	25	25	25	25

Assuming that the total for VF and F as high-level utilization, O as average, and total for R and N as low level. Table 4.9, Shows that desktops have a low-level utilization of 75% and a high level of 25%. YouTube videos have a 50% high level and a 50% low level. Educational videos have 75% low-level utilization and 25% high-level. LCD projectors, Laptops, and cartoons have a 25% high level, 25% average, and 50 % low level. Digital cameras have a 25% average and a 75% low level. Television has 100% low-level utilization and smartphones have 25% high-level utilization, 25% average, and 50% low-level utilization. The findings indicate that most visual resources had a high percentage of low-level utilization in the instruction of AD except the YouTube videos that was 50% utilized mostly in the experiment group.

This was attributed to lack of technological knowledge, lack of interest, and negative attitude by AD teachers towards refining their pedagogical approaches such as adopting the use of modern AV resources in their instruction in order to support learning. One school head opined that:

> *My administration offers support in the teaching of all subjects in equal measures. I offer necessary assistance brought forward to me by my teachers regarding teaching and learning since our core business is to improve the mean score of the school. AD teacher has never raised any concern on the need to get AV resources for teaching.* Science *teachers in this school are the only ones am aware have embraced AV technology in their teaching and I have offered the necessary support within my capability.*

These findings concur with Wagah et al., (2009) study on attitude of teachers and students toward AD that was displayed by little or no effort made to enhance the teaching and learning of the subject. The study also noted that schools in Nyanza region offering AD curricula had inadequate quality resources for teaching the subject. The conditions of the art rooms were deplorable and teachers had a negative attitude. The study further revealed that science subjects had well-built and equipped science laboratories and the administrators were committed to the implementation of science subject's curriculum compared to AD. The findings are also consistent with the study done by Bariham (2019) on the who cited lack of technological knowledge and negative attitude towards the use of new technologies were some reasons teachers didn't adopt computer-based instruction in teaching and learning of social studies in Northern Ghana.

The Findings for the utilization of audio resources presented in Table 4.10.

Table 4.10: Utilization of Audio Resources

	Percentage Frequency				
	VF	**F**	**O**	**R**	**N**
Radio	0	0	0	0	100
Tape-Recorder	0	0	0	0	100

Table 4.10 shows, Radio and tape recorder has 100% low-level utilization. This implies that Audio resources had low-level utilization in the teaching of AD. Teachers found it better to use the talk-chalk method over the Audio resources integrated method. The study established that Radio and tape recorders available in schools were mostly highly utilized in language and music subjects. The study further established that AD students preferred teaching presentations done using resources that were both audio and visual. This finding concurs with (Ibe and Abamuche,2019) whose study discovered that most secondary classrooms in Nigeria have remained the 'talk-chalk' method, unlike the tertiary institution that has adopted new AV technology in the instruction.

For the utilization of print resources, findings given in Table 4.11 below.

Table 4.11: Utilization of Print Resources

	Percentage Frequency				
	VF	**F**	**O**	**R**	**N**
Text Books	75	25	0	0	0
Photographs	0	25	50	0	25
Posters	0	25	50	0	25
Charts	0	25	25	0	50

Table 4.11 shows, the Text books have 100% high level of utilization. Photographs and posters have 25% high level, 50 % average, and 25% low level. Charts have 25% high level, 25% average, and a 50% low level of utilization. This implies textbooks were more highly utilized than all the other print resources. The results agree with Muteheli (2017), study on a survey of instructional materials used in Teaching Oral literature in Bungoma South Sub- County. The study noted that there is a wide range of educational media that can be utilized in the instruction of oral literature in schools. Despite this, the most utilized instructional media is textbooks and chalkboards.

For the utilization of two and three-dimensional visual display resources, the findings were as shown in Table 4.12 below.

Table 4.12: Utilization of Two and Three Dimensional Visual Display Resources

	Percentage Frequency				
	VF	**F**	**O**	**R**	**N**
Boards	75	25	0	0	0
Models	0	25	0	0	75

Table 4.12 show, that the white/black boards have a 100% high level of utilization. Models have 25% high-level and 75% low-level utilization. This implies that boards were highly utilized in teaching while the model was hardly utilized. This was due to the fact that chalkboard use is the most common tradition employed since they highly used the convectional 'talk-chalk' method of teaching and learning. This is in agreement with Kinyua (2017), study that indicated teachers avoided the use of computer instruction to teach graphic design. This was a result of a low standard of computer literacy among AD teachers which limited them to convectional instructional methods Omariba (2012) also noted that printed resources and chalkboards were the most available and utilized in teaching and learning in secondary schools in Kisii County in Kenya.

For the utilization of internet resources, the findings were as shown in Table 4.13.

Table 4.13: Utilization of Internet Resource

	Percentage Frequency				
	VF	**F**	**O**	**R**	**N**
Internet	25%	25%	25%	0	25%

Table 4.13 shows that the internet resource has 50% high level utilization (combination of Very Frequent and Frequent), 25% average (Occasionally) and 25% low level utilization (Rarely and Never). This implies that most school were connected to internet which is the most important resources in the 21st fast paced technological era that enables optimum utilization of modern AV resources (Harcourt, 2020). One school head in the experimental school (EG 1) stated that:

> *My administration is keen on MOE policies on reforming teaching and learning approaches such as ICT integration. I give it much*

focus because I know the plenty of advantage it will give my teachers and student over the convection method. In my first year in this school, I made sure we had internet connected and since then the service has never been interrupted. Teachers are free to use the service at their own peril and I encourage them to utilize it for instruction purposes. I must mention that young teachers, including my AD teacher who are technologically powered, are utilizing this in their lessons and I hope to the same adopted by others. My students are in the technologically exposed generation and they prefer most AV-integrated lessons and also doing class research in the ICT center using a computer only.

The findings of the study were in agreement with Mwakapina (2016), who stated that most students in Tanzania are technologically based generation therefore teachers should adopt a variety of AV tools offered by modern technology such as mobile phones, computers, smart boards which enable the learning process to happen in and outside the classroom. He further acknowledged that the government of Tanzania recommends student-directed methods of learning that can be made easier through the use of modern AV media and the internet.

The teachers were to explain how often they use Audio Visual resources in AD lessons. The EG1 teacher indicated once or twice for each topic taught and always during the teaching of the topic of painting. EG2 teacher said once in every topic. CG1 teacher said once or twice for each topic taught depending on availability while CG2 stated mostly in painting topic.

The finding therefore imply that AD teachers were striving to adopt use of AV technologies in their lesson, however, this was not very often in most schools because of a number of reasons such as; constrain in sharing the AV resources with the rest of the such because schools had no AV resource for AD only except the EG1 that had two computers, a projector, white board, and the Art room had ethernet connection. The study also revealed a conflicting finding where some teachers avoided the use of AV resources in AD teaching because it limited the learner’s creativity but the majority anonymously agreed that when students are well guided, the resources do not limit the scope of creativity and they become bolder and more explorative enabling them to produce high quality art works.

These findings agreed with Sion (2014), study on creativity in elementary art classroom: incorporating strategies for encouraging creativity noted multiple ways to encourage creativity in art students which include; teachers to incorporate research-based teaching strategies, designed to inspire creativity using different resources powered by the internet, provide a classroom environment that supports creativity by not limiting to teacher and textbook demonstration.

4.4.2 Challenges Facing AV Resource Integration in AD

The study also incidentally established some challenges AD teachers are facing during the utilization of AV resources in AD through the principal’s unstructured interview and teacher’s questionnaire part two item number (3). During the interviews, one principal from CG2 said that:

> *The school does not get a vote head for instruction materials such as AV resources in the capitation from the government. Therefore, we lack funds to acquire such materials for instruction. We can only look forward to getting*

> *funding from other quotas on the same since it's hard to convince our parents to contribute to such a course*

Similarly, another head reported that:

> *The school has a population of 1386 students, we have a computer laboratory with 28 functional computers. The computers were a donation from a non-governmental organization partnering with the MOE. The resources are very few and the need for more was necessary. However, the funding from MOE is not forthcoming and our school has more pressing needs to cater to before addressing such an issue*

Art and Design teachers brought forth availability of the laptops and projectors as a major challenge. The teacher in EG1 indicated that even if the laptop and projector are available, they are shared with other departments making it difficult to plan for AV resource integration lessons. The unreliable electric power supply was another challenge. The teachers complained that electricity is often not available hence teachers had no other option apart from switching to conventional instruction methods. Some schools did not have any other power backup mechanisms and hence totally relied on power from the national grid. The teacher in EG1 and CG2 stated that students don't have access to the AV resources independently hence limited time to benefit from the resource. Another teacher in CG2 stated limited allocated time to cover the syllabus as a hindrance to proper and sufficient AV resource utilization. CG1 and EG2 stated limited time for preparations and adaptation in AD lessons. They quoted AV resource lesson demands much time in research and actualization of the lesson.

These findings therefore indicate that school administration lack of funding to acquire AV resources for teaching in school, schools have an unreliable electric supply, inadequate AV resources for teaching, and the limited time for preparing an AV integrated lesson. The findings concur with Muteheli (2017), (Mehmet, Sule, and Secer,2016), and (Ibe and Abamuche,2019) whose findings listed a lack of funding, inadequate AV resources, poor and unreliable electricity supply, and limited time due to the overloaded syllabus as barriers hindering the integration of AV resources.

4.5 Influence of Integration of AV-Resources in Academic Performance of Students in AD

In order to evaluate if the integration of AV resources has a significant influence on academic performance in AD. Control and experimental groups were administered with a pre-test examination. This enabled the researcher to establish the entry behavior of the students before the experiment. The experimental groups (1 and 2) teachers were then trained to use AV resource aids during AD lessons as an intervention treatment. There was no intervention for the control groups (1 and 2) hence teachers continued with their conventional instructional method. A post-test test was administered in order to assess the influence of AV resources in the academic performance of AD by establishing any significant different in the academic performance of the two groups by the end of the experiment.

4.5.1 Analysis of Pre-Test Mean Scores

The AD Test (ADT) pre-test and post-test was on the topic (painting). The pre-test (ADT 1) and post-test (ADT 2) items were marked by the researcher out of maximum 100 marks. Data was keyed in SPSS version 22, results were generated and analyzed using descriptive statistics. The results for the pre-test scores per each group were as shown in Table 4.14.

Table 4.14: Pre-Test Mean Scores and Standard Deviation for All Groups

Group	Count	Mean	Standard Deviation (SD)
EG1	15	52	9
EG2	14	54	6
CG1	17	51	8
CG2	13	50	6

Key: EG1-Experimental Group One, EG2-Experimental Group Two, CG1-Control Group One and CG2-Control Group Two

Table 4.14 data show the pre-test mean score for EG1 was 52, EG2 was 54, CG1 was 51 and CG2 was 50 with standard deviations of 9, 6, 8 and 6 respectively. The results reveal that both the experimental and control groups are comparable because they have almost the same performance. A graph to represent the above data is shown below in Figure 4.3.

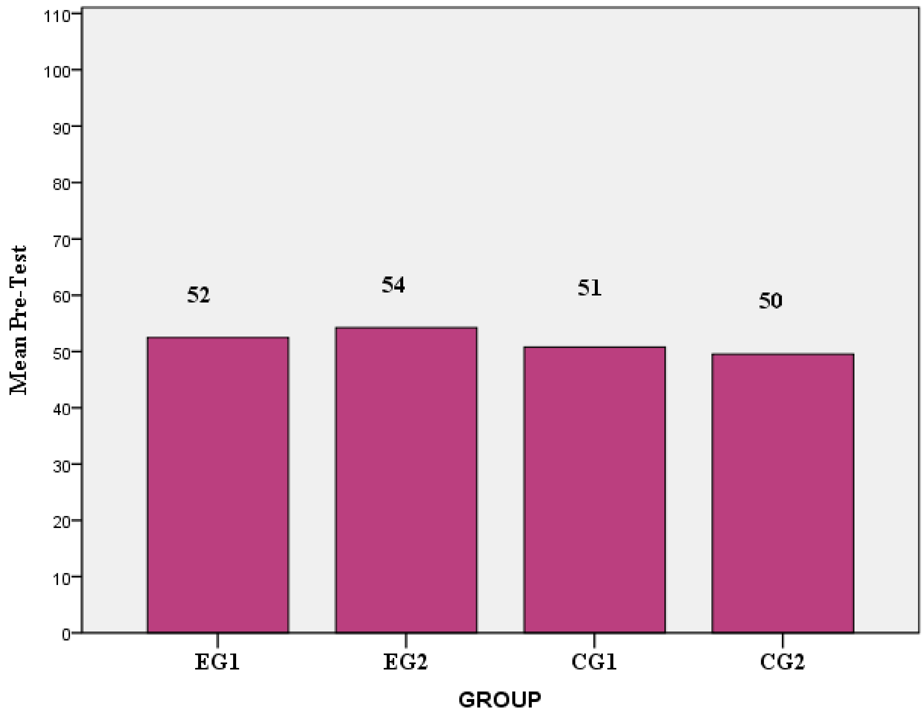


Figure 4.3: Academic Performance for All Groups by Mean Score

Figure 4.3 show that the academic performance in the pre-test was almost the same with an insignificant difference. This shows that the experimental and control groups performed almost the same in AD. This was critically important in experimental design. In order to test any significant difference in academic performance among the groups, an independent t-test was done for the pre-test mean scores. The results were as shown in Table 4.15.

Table 4.15: Comparison of Pre-Test Mean Scores of EG1 and CG1

Group	N	Mean	T	d f	Sig. (2-tailed)
EG1	15	52	.575	30	.570
CG1	17	51			

Table 4.15 show that the t-value was .575 at α = .005 probability. Assuming there was a significant difference in academic performance between the two groups, the values were less than the P value of 1.697 at df 30. This shows that there was no significant difference in academic performance in the two groups in category A of the study.

A t-test was done for the schools in category B (EG2 and CG2). Results were as shown below in Table 4.16.

Table 4.16: Comparison of Pre-Test Mean Scores of EG2 and CG2

Group	N	Mean	T	Df	Sig. (2-tailed)
EG2	14	54.21	2.054	25	.051
CG2	13	49.54			

Table 4.16 show that the independent t-test value obtained was 2.054 at α=0.05. The value is almost equal to the P value of 2.054 at a df of 25. This value signifies that there was no significant difference in academic performance among the two groups in category B schools before treatment.

4.5.2 Analysis of Post-Test Mean Scores

Integration of AV-resources as an instruction approach was used to teach the experimental groups for one term (10 weeks). The conventional AV-resource instruction approach was used to teach the control group for the same term (10 weeks). The conventional AV-resource instruction did not alter AV resource integration activities. This was achieved by letting the teachers to continue with their original teaching approach with no treatment intervention.

By the end term of (10) weeks, a Post-test exam (Appendix vi) was administered out of 100 marks. The posttest exam was on the topic of painting. The data was keyed in SPSS, the report was generated and analyzed using descriptive statistics and an independent t-test.

Learners' performance in the post-test exams for the groups was shown in Table 4.17.

Table 4.17: Groups Post-test Mean Scores and Standard Deviation

Groups	Count	Mean Score	Standard Deviation
EG1	15	62.20	8.002
EG2	14	64.14	8.637
CG1	17	48.24	6.951
CG2	13	49.62	6.862

Key: EG1-Experimental Group One, EG2-Experimental Group Two, CG1-Control Group One and CG2-Control Group Two

Table 4.17 indicates that the post-test mean score for EG1 was 62, EG2 was 64, CG1 was 48 and CG2 was 50. The standard deviations were 8,9,7 and 7 respectively. Figure 4.4 illustrates the bar graph used to display the data.

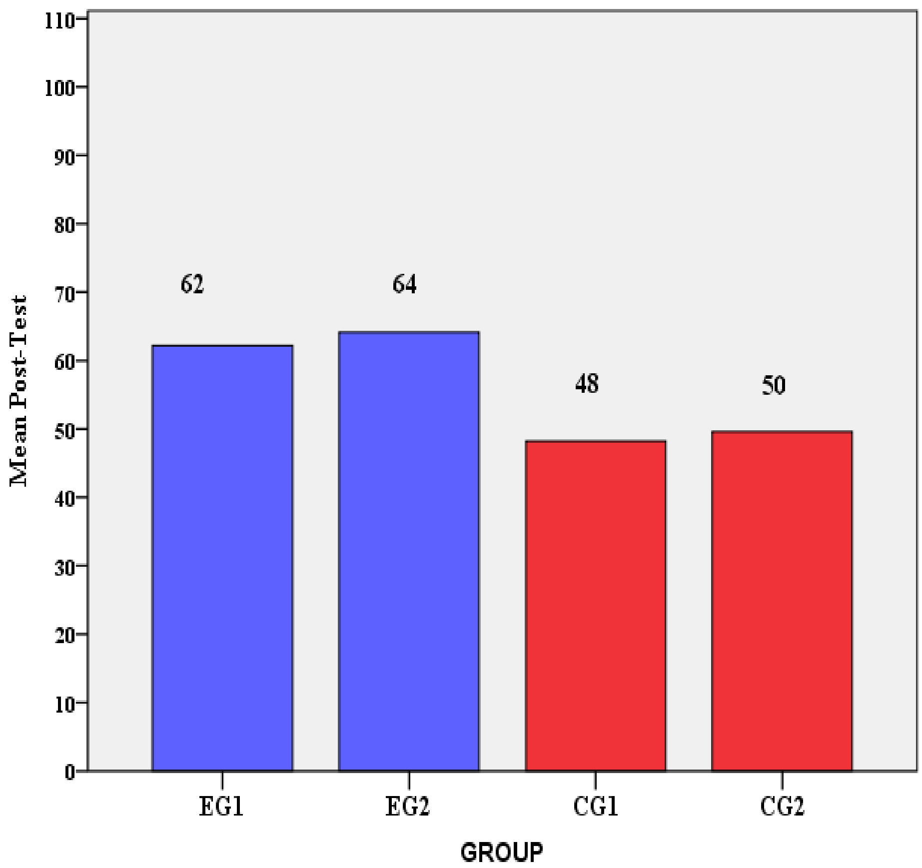


Figure 4.4: Groups Mean Scores for Post-Test

Figure 4.4 reveals that the academic performance in experimental groups in both cases was better than the academic performance of the control groups. The experimental group had a mean of 62 marks while the control group achieved an average score of 48. Experimental group two attained a mean score of 64 marks. The control group attained a mean score of 50 marks. This indicates that the intervention/ treatment influenced the academic performance of students in AD. AV-resource based instruction approach is therefore more effective compared to the conventional methods.

The figure further, indicates that the post-test average score of the experimental group was greater than those of the control group. This, therefore, mean that the students who were instructed with AV-resource integrated approach attained higher scores than their counterparts who were taught using the Conventional teaching approach. In order to find out whether there was any significant difference in academic performance between the group means, a t-test was computed on post-test scores for experimental and control groups. The results were as shown in Table 4.18

Table 4.18: Comparison of Post-Test Mean Scores of Groups

Groups	N	Mean	T	Df	Sig. (2-tailed)
EG1	15	62.20	5.284	30	.0000
CG1	17	48.24			
EG2	14	64.14	4.814	25	.000
CG2	13	49.62			

Table 4.18 show the comparison of academic performance in the post-test examination and the computed independent 2-tailed t-test values for group A which involved EG1 and CG1 and group B which involved EG2 and CG2 To test the null hypothesis $\mathbf{H_{01}}$ which stated, "There is no significant difference in academic performance between students taught using AV resources integration on how to create a painting composition and those who are not"

For group A; which involved EG1 and CG1, the P =.000 value is less than α=0.05. For group B which involved EG2 and CG2 the P value was less than α. This implied that, there was statistically significant difference. The null hypothesis was therefore rejected and the alternative hypothesis $\mathbf{H_1}$ was adopted. $\mathbf{H_1}$ therefore stated, there is a significant difference in academic performance between students taught using AV resources integration on how to create a painting composition and those who are not

To test the second hypothesis $\mathbf{Ho_2}$: which stated that there is no significant influence of AV resources on students' interpretation of themes in painting. The Chi-Square technique was used and was calculated from the score in Pre-test and post-test for the two groups which were exposed to AV-resource integration training. Table 4.19 displays the outcomes.

Table 4.19: Chi-Square Values for EG1 and EG2

GENDER	**N**	$\frac{(E-O)^2}{E}$	χ^2	**Df**	**P**
EG1	15	26.261	47.2994	28	41.34
EG2	14	21.0384			

Setting $\alpha = 0.05$, df = 28, $\chi^2 = 47.2994$

With the second null hypothesis **Ho$_2$**: There is no significant influence of AV resources on Students' interpretation of themes in painting, The Chi-square value (χ^2) calculated was 47.22994. The value was higher than the p-value (41.34) with a probability of less than 5%. For this reason, the alternative hypothesis was adopted and the null hypothesis **Ho$_2$**: was rejected. This implies that there is a statistically significant influence of AV resource integration on Students'' interpretation of themes in painting.

These findings implies that there is a statistically significant difference in AD academic performance between learners taught by utilizing AV resources and those taught with the convectional instruction method. These research findings are consistent with the results of Tang and Intai (2017) on the effectiveness of AV aids in teaching lower secondary science in a rural secondary school. The study used a quasi-experiment that involved Thirty Form three students as participants who had evenly distributed academic performance. The findings after analyses of Pre and Post assessment scores indicated that AV aids are effective in increasing the understanding of learners. This was because of the significant improvement of scores registered by learners during post assessment in the experimental group.

Similarly, above findings were also in line with Tairu (2018), whose main objective was to evaluate the impact of the use of Audio Visual materials on the academic achievement of students. The results obtained, showed that using AV aids in teaching enhanced students' performance in the topic on classification of living things. Further, the findings are also in agreement with Ibe and Abamuche (2019) survey in Nigeria involving one hundred and fifty secondary school students on the impact of AVs on students' performance in Biology. The findings discovered that the treatment group taught with AV resources got higher scores compared to the control group which was taught by the use of the traditional instruction method.

4.6 Gender Differences and Students' Academic Performance in AD

The research fourth objective attempted to find out whether there were any significant differences in academic performance in AD by gender when students were taught with AV resources. Experimental groups One and Two were instructed on AV resource integration and had 15 female and male 14 students respectively. To obtain and describe the variation of AD achievement scores by gender descriptive statistics were done. The results were presented in Table 4.20

Table 4.20: Descriptive Statistics of Post-Test Scores by Gender in Experimental Groups

Group	Gender	N	Mean	Std. Deviation (SD)
EG1	F	15	62.20	8.002
EG2	M	14	64.14	8.637

Table 4.20 reveals that the average mean scores of C.A.T for the male students were slightly higher than the Female counterpart (*Mean = 64.14, SD = 8.637)* than their counterpart the females *(Mean =62.20, SD = 8.002).* To compare the academic

achievement of the students in AD by gender, an independent t-test was computed to test the null hypothesis **Ho_3** There is no significant gender difference in AD performance when both boys and girls are taught using AV resources. This was meant to establish whether the mean scores of male and female students were statistically different. The results were as shown in Table 4.21

Table 4.21: Independent Sample t-test of Post-test Mean Scores by Gender in EGA and EGB

Group	Gender	N	Mean	Std.dev	t-value	Df	Sig. (2-tailed)
EG1	F	15	62.20	8.002	-6.29	27	0.535
EG2	M	14	64.14	8.637			

The analysis of the t-score in table 4.21 indicates that there was a difference between Post test mean scores for female *(Mean = 62.20, SD =8.002)* and Male students *(Mean = 64.14, SD =8.637)*. The difference was significant, t = -6.29, at α= 0.05 the P-values was 0.535 hence non-significant. Therefore, **Ho_3:** There is no significant gender difference in AD performance when both boys and girls are taught using AV resources. This, therefore, implies that the academic performance in AD is not significantly different in terms of gender when students are taught using an AV integrated instruction. These findings are conforming with Ibe and Abamuche, (2019). The study findings therefore confirmed that the mean difference between the achievement scores of male and female learners in Biology was not significant. Similarly, Julius (2018). Study on effect of computer aided instruction (CIA) on Students' Academic and Gender Achievement in Chemistry among Selected Secondary School Students of Tharaka-Nithi County in Kenya which revealed that there was no a significant gender difference in Chemistry academic achievement in favor in terms of gender.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This chapter summarizes the research findings, presents the conclusions, and makes policy recommendations. Finally, the chapter presents suggestions for further research studies that should be carried out so as to address the gaps that emerged from the study.

5.2 Summary of the Major Findings

The purpose of the study was to investigate Audio Visual resources influence on students' academic performance in AD in secondary schools in Kakamega county, Kenya. Utilization of AV resources is important because it enables learners to gain a deeper understanding of concepts in the learning areas which could enhance good performance in the examination. The study assumed that AV resource-integrated lessons are very vital in enhancing students' content retention.

5.2.1 Audio Visual resources used in the instruction of AD

The study was interested to find out which type of AV resources are available for instruction purposes in AD. It was established that the majority of schools had limited AV resources available. It was also notable that the majority of the AV resources available in the schools included; computers, LCD Projectors, laptops, digital cameras, and smartphones. These resources were found in the ICT laboratories for multi-purpose use in the school but none was allocated for AD instruction. Art teachers and students used these resources for teaching and learning on a need basis only unlike the science and language subjects that had resources such as laptops, digital cameras, and a smart board permanently allocated for the subject in most schools. Audio resources such as radio was not a popular type of resource used in teaching and learning AD because it was regarded as an outdated technology.

The research also established that You-Tube Videos were available and utilized in most of the selected schools which was attributed to internet connectivity in a majority of the school. The textbooks were the common type of print resources available and highly utilized by majority of teachers on the instruction of AD. Chalkboard was also the most available traditional resource that was found in all schools and this was highly attributed to the conventional talk and chalk method that was the notable common practice in the teaching of AD.

5.2.2 Extent AV resources were utilized in the instruction of Art and Design

The study was intended in finding out the extent to which AV resources are used in the instruction of AD. The research findings indicate that most AV resources which included computer, LCD projectors, Laptops, smart phones had low-level of utilization in the instruction of AD except the You-Tube videos that was highly utilized in most of the schools. This was attributed to inadequacy of resources, lack of interest by AD teachers towards refining their pedagogical approaches such as adopting the use of modern AV resources in order to enhance learning.

Audio resources such as radio and the tape recorder had low level of utilization in the teaching of AD. Teachers found it better to use the talk-chalk method over the audio resources integrated method. The study further revealed AD teachers highly utilized chalkboard and textbooks which are regarded as traditional AV resources in the instruction process. Though they were also striving to adopt modern AV technologies in their lesson, however this was not very often in most schools because of a number of constrains.

These constrains included; school administration faced inadequate funding from relevant stakeholders to acquire AV resources for teaching in schools, unreliable electricity supply, limited time for preparing an AV-integrated lesson due to the demanding AD syllabus and lack of effort and interest from teachers of AD to constantly use modern AV resources in classroom instruction.

5.2.3 Influence of Integration of AV Resources in Academic Performance of Students in AD

The study focused to establish if the utilization of AV resources in teaching has a significant influence on academic achievement in AD. Form two AD students were sampled from four selected schools in Kakamega county, where two constituted experimental group and two control group. The two groups were subjected to a pre-test examination on the painting topic to obtain pre-test scores. Thereafter, the experimental group was taught painting topic using the intervention (AV integrated lesson) while the control group was taught using the convectional instructions method. The two group were subjected to a post-test after ten weeks. The post-test scores from the two group in terms of average scores indicated that the experimental groups (EG1 &2) had a high mean of 64% and 62% while (CG 1&2) had a mean of 48% and 50%. The findings indicated that the average mean score of post-test scores of the experimental groups was greater than those of the control group. Further it was statistically ascertained there was a significant difference in academic performance between the post-test scores for experimental and control groups. Therefore, this study concluded that learners instructed using the AV resources performed better than the ones taught with the convectional method.

5.2.4 Gender Differences and Students' Academic Performance in AD

The last objective of the study was to establish whether there were any significant differences in academic performance in AD by gender when students were taught with AV resources. Experimental groups one and two were taught using AV resources and had fifteen female and fourteen male students respectively. To compare the academic achievement of the students in AD by gender, an independent t-test was computed to test the null hypothesis **Ho_3** which stated **"**There is no significant gender difference in AD performance when female and male learners are taught using AV resources''. This study statistically established that academic performance in AD is not significantly different in terms of gender when students are taught using AV resource instruction.

5.3 Conclusion

The following conclusions were arrived at in reference to the study findings that; AV resources commonly available for AD instruction in schools is chalkboards and textbooks. The modern digital type of AV like laptops, smart boards, projectors, digital cameras, and smartphones were very limited in number in most schools and were meant for general use in schools and, not purposely allocated for the instruction of AD.

The use of AV resources in the instruction process aids in demystifying abstract concepts, and makes learners to think boldly and creatively which enables them to highly understand concepts and skills, and apply in different context including responding to examination questions. This to a great extent positively influence academic achievement in AD which implies that students' scores in AD and the general school mean score would be good enough for the students to secure courses at tertiary level as well as improving the overall mean of their school. Consequently, this will attract more students to select the subject up to form four since it is an elective subject with optimist that it will improve their performance as is presumed. Further, this will enhance high enrolment in AD in the schools and at the national level since school administrators will be encouraged to offer the subject in their schools as it will contribute positively to the overall mean score of the school's.

Moreover, there was no difference in performance in terms of gender when learners were taught using resources. This encourages AD teachers to confidently use AV resources in teaching without being sensitive to any gender and expect positive outcome on their performance.

5.4 Recommendations

The following recommendations were made based on the findings of the study:

(i) Schools should be provided with adequate funding for the acquisition of modern AV resources and their accessories such as internet and power for instruction of Art and Design.

(ii) Relaxing of policies on technology use in schools by students such as access to internet and smart use.

(iii) Formulate policies and measures that confines teachers towards utilization of AV resources in the classroom instruction.

(iv) Refine teachers' pedagogical skills through regular retooling on new trends in classroom instruction such as use of AV resources in order to realize acquisition of 21^{st} century in learners.

(v) Employment of more AD teachers and staffing them in more schools in order to give more learners in the country an opportunity to learn the subject.

(vi) Teacher education curriculum to be tailored to incorporate the dynamic knowledge on new trends in education technology.

5.5 Suggestions for Further Studies

The following recommendations were made based on the research findings:

i. Research on Audio Visual resources instruction in different areas in AD should be carried out. This is because the study was limited to painting only.

ii. Research on Audio Visual resource instruction in other levels of education should be undertaken since this study was done in secondary schools only.

iii. This study was also limited to public Secondary Schools, a similar study should be done in private secondary schools.

REFERENCES

Aggarwal J. C (2009) Essentials of Educational Technology Innovations in Teaching Learning (2nd ed). New Delhi. Vikas Publishing House.

Anderson, R. C., Reynolds, R. E., Schallert, D. L., & Goetz, E. T. (1977). Frameworks for comprehending discourse. *American educational research journal*, *14*(4), 367-381.

Akram, S., Sufiana, & Malik, K. (2012). Use of Audio-Visual aids for effective teaching of biology at secondary schools' level. *Education Leadership*, 50, 10597–10605

Ashaver, D., & Igyuve, M. S. (2013). The use of Audio-Visual materials in teaching and learning process in College of Education Benue state, Nigeria. *Journal of Research and Method of Education*, 6(1), 44–55.

Ashaver, D. (2013). The Use of Audiovisual Materials in the Teaching and Learning Processes in Colleges of Education in Benue State-Nigeria. *IOSR Journal of Research & Method in Education (IOSRJRME)*, *1*(6), 44–55. https://doi.org/10.9790/7388-0164455

Asma, L. (2015). *The Impact of Using the Audiovisual Aids to Improve Students' Speaking Skill: The Case of Third Year Students of English at Mohamed*.

Badalova, B. (2021). Effectiveness of audio-visual aids in teaching process. *Academic research in educational sciences*, *2*(4), 1905-1909.

Baddeley, A. D. (1983). Working memory. *Philosophical Transactions of the Royal Society of London. B, Biological Sciences*, *302*(1110), 311-324.

Bariham, I. (2019). Influence of Teachers' Gender and Age on the Integration of Computer Assisted Instruction in Teaching and Learning of Social Studies among Basic Schools in Tamale Metropolis. *Global Journal of Arts, Humanities and Social Sciences*, *7*(2), 52-69.

Basic Education Curriculum Framework BECF 2018. https://kicd.ac.ke/curriculum-reform/basic-education-

Bowen, G. (2017). *Document Analysis as a Qualitative Research Method*. *August 2009*. https://doi.org/10.3316/QRJ0902027

Bussell, J. V. (2019). Keeping up with AV Technology in Schools- Towards Europe education. *Academic research in education*.

Cohen, L., Manion, L., & Morrison, K. (2011). Planning educational research. *Research methods in education. New York: Routledge Editors*.

Cook, T. D., Campbell, D. T., & Shadish, W. (2002). *Experimental and quasi-experimental designs for generalized causal inference* (Vol. 1195). Boston, MA: Houghton Mifflin.

Cooper, G. (1998). Research into cognitive load theory and instructional design at UNSW.

County Education Office (CEO) -Kakamega County, KSCE data for years 2015-2019.

Creswell, J. W. (2014). *A concise introduction to mixed methods research*. SAGE publications.

De Bernardes, A., & Olsen, E. G. (1948). Audio-visual and community materials:

De Sousa, L., Richter, B., & Nel, C. (2017). The effect of multimedia use on the teaching and learning of Social Sciences at tertiary level: A case study.

Dewitt, D., Alias, N., Siraj, S., Yaakub, M. Y., Ayob, J., & Ishak, R. (2013). The potential of YouTube for teaching and learning in the performing arts. *Procedia - Social and Behavioral Sciences*, *103*, 1118–1126.

Eaton, S. E. (2010). *Global Trends in Language Learning in the 21st Century*.

Education Business Magazine

Eisner, E. W. (2002). The Arts and the Creation of Mind. New Haven: Yale University Press.

Harcourt, P. (2020). *Enhancing Teaching and Learning in the 21st Century: The Role of Educational Technology*. *3*(1), 290–299.

John, O. (2017). *Effects Of Computer Assisted Learning on Instruction in Organic Chemistry in Public Secondary Schools in Kwale County, Kenya*.

Ibe, E., & Abamuche, J. (2019). Effects of audiovisual technological aids on students' achievement and interest in secondary school biology in Nigeria. *Heliyon*, *5*(6), e01812.

Julius, J. K. (2018). Influence of Computer Aided Instruction on Students' Achievement, Self-Efficacy and Collaborative Skills in Chemistry in Secondary Schools of Tharaka-Nithi County, Kenya. *Unpublished PhD Thesis. Kenyatta University*.

Kakamega County Education Office, examination analysis for 2019,2018,2017,2016.

Karehka, R. (2013). The use of technology–in education and the teaching process.

Kemoli, G. (2019). *introduction of contemporary African art in the Kenyan matatu graffiti industry to create an appreciation for the beauty of African craft*

Kenya National Bureau of Statistics (KNBS) (2019). Population and Housing Report, Nairobi, Kenya.

Kinyua, G. (2017). *Performance in AD in Public Secondary Schools.*

Knight, L. E. (2014). *Art Education in Finland and the United States: A Qualitative Inquiry into Teacher Perceptions*.

Kothari, C. R. (2004). *Research methodology: Methods and techniques*. New Age International.

Kridel, C., & Schmidt, S. J. (2012). Civic Education Curriculum. *Encyclopedia of Curriculum Studies*, 1–145.

Majumder, Prateek. "Audio Visual Aids." 25 June 2019. Medium.

Makokha, W. C. (2017). *Teachers' Knowledge and Skills in Developing and Utilizing Audio Visual Instructional Resources in Teaching and Learning Oral Literature in Selected Public Secondary Schools in Kenya*. 177–196.

Mathew, N. G., & Alidmat, A. O. H. (2013). A study on the usefulness of Audio-Visual aids in EFL classroom: Implications for effective instruction. *International Journal of Higher Education*, *2*(2), 86-92.

Muteheli, A. F. (2017). A survey of the use of instructional media in teaching oral Literature in Secondary schools in Bungoma South Sub-County, Kenya. *International Journal of Scientific and Research Publications, 7*(8), 265–268.

Mugenda, A. G., & Mugenda, O. M. (2012). Research Methods Dictionary. Nairobi Kenya Arts Press.

Mwakapina, J. W., Mhandeni, A. S., & Nyinondi, O. S. (2016). WhatsApp mobile tool in second language learning: Opportunities, potentials and challenges in higher education settings in Tanzania.

Neeraja, K. P. (2011). *Textbook of communication and education technology for nurses*. JP Medical Ltd.

Omariba, A., Ayot, H. O., & Ondigi, S. R. (2016). Teachers' Preparedness in Integrating Information Communication Technologies in Public Primary Teacher Training Colleges in Kenya. *International Journal of Education and Research*, *4*(9), 201–212.

Omariba, A. (2012). challenges facing teachers and students in the use of instructional technologies: a case of selected secondary schools in Kisii county, Kenya. https://ir-library.ku.ac.ke/bitstream/123456789/6532/3/Omariba

Omoniwa, F. A., & Emmanuel, A. (2019). Assessment of the use of Audio-Visual aids in the teaching of social studies by teachers in junior secondary schools, Kaduna South Local Government Area. *Samaru Journal of Information Studies*, *19*(1), 14-26.

Ongachi, W. M., Okello, O. M., & James, A. (2013). Challenges on Implementation of AD Curriculum in Secondary Schools in Kenya. *Academic Research International*, *4*(5), 390–398.

Orodho, A. J. (2005). Techniques of writing research proposals and reports in Educational and Social Sciences, Nairobi:

Oyesola, G. O. (2014). Criteria for selecting Audio Visual material in geography in post primary institution.

Patera, M. (2009). The Potential of 3D Visualisation Technology in Art & Design Education. *Adobe*, *May*.

Pavio, A. (1990). Mental Representations: dual coding approach. New York: Oxford University Press.

Ranasinghe, A. I., & Leisher, D. (2009). The Benefit of Integrating Technology into the Classroom. *International Mathematical Forum*, *4*(40), 1955–1961.

Republic of Kenya (2017). Basic Education Curriculum Framework. Nairobi: Kenya Institute of Curriculum Development.

Sessional Paper No.2 of 2015 on Reforming Education and Training Sectors in Kenya https://repository.kippra.or.ke/handle/123456789/607

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference/William R. Shedish, Thomas D. Cook, Donald T. Campbell*. Boston: Houghton Mifflin.

Sikudhani, M. (2016). *The Influence of Teaching and learning materials on students' performance in secondary schools* (Issue June).

Singh, C. K. S. (2021). Review of research on the use of Audio-Visual aids among learners' English language.

Sions, H. K. (2014). *Creativity in the elementary art classroom: Incorporating strategies for encouraging creativity*.

Situma, J. (2016). Methods used by teachers to teach Christian Religious Education in secondary schools in Kimilili in Bungoma County, Kenya.

Starko, A. J. (2017). Creativity in the Classroom: Schools of Curious Delight. Routledge.

Swank, R.C (2011), The Educational Function of University Library. http://www.ideals.illinois.edu/bitestream/handle/2142/5455/librarytrend

Tairu Idris, A. (2018). Use of Audio-Visual Materials in Teaching and Learning of Classification of Living Things Among Secondary School Students in Sabon

Gari LGA of Kaduna State. *Plant*, *6*(2), 33.

Tang, D. K. H., & Intai, R. (2018). Effectiveness of Audio-Visual Aids in Teaching Lower Secondary Science in A Rural Secondary School. *Asia Pacific Journal of Educators and Education*, *32*(January), 91–106.

Triacca, S. (2017). Teaching and Learning with Pictures the Use of Photography in Primary Schools. *Proceedings*, *1*(9), 952.

Ulger, K. (2018). The effect of problem-based learning on the creative thinking and critical thinking disposition of students in visual arts education. *Interdisciplinary Journal of Problem-Based Learning*, *12*(1).

Wagah, M. O., Indoshi, F. C., & Agak, J. O. (2009). Attitudes of Teachers and Students towards AD Curriculum: Implications for Vocational Education in Kenya. *Educational Research and Reviews*, *4*(10), 448–456.

White, H., & Sabbarwal, S. (2014). Quasi-experimental design and methods. *Methodological briefs: impact evaluation*, *8*, 1-16.

Wawuda, G. M. (2019). Integration of YouTube videos in teaching and learning of English language speaking skills among secondary school students in Nakuru county, Kenya (Doctoral dissertation, Kenyatta University).

Wilson, L. O. (2016). Anderson and Krathwohl–Bloom's taxonomy revised. *Understanding the New Version of Bloom's Taxonomy*.

Yunus, M. M., Salehi, H., & John, S. A. (2013). Using visual aids as a motivational tool in enhancing students' interest in reading literary text. *Recent Advances in Educational Technologies*, 114-17.

APPENDICES

Appendix I: Letter of introduction

Dear respondent,

RE: MED RESEARCH

I am Ruth Muteshi, post graduate student at Kenyatta University pursuing a (Med) Degree. As part of the requirement of the programme, am carrying out a study on Audio-Visual resources use instruction. You have been selected to participate and respond to questions truthfully. This research is purely academic hence any information given will be used for the said purpose and kept confidential. Your cooperation will be highly appreciated.

Thank you,

Yours sincerely,

Ruth Muteshi.

Researcher.

Appendix II: Questionnaire for Art and Design Teachers

The responses offered here will be treated with confidentiality and for academic purposes only.

Part 1: Background Information.

1. Gender. Male......... Female ....
2. Age category in years.

   Below 25.......   41-45 ....

   26-30 ....   46-50 ....

   31-35 ....   51-55 ....

   36-40.... ....   56-60 ....

3. Level of qualification

   Post-graduate   ....

   Degree   ....

   Diploma   ....

   Untrained   ....

4. Teaching experience in years

   1-5 ......   16-20 ......

   6-10 ....   20-25 ....

   10-15 ......   26 and above ....

Part 2:

1. Do you use Audio-Visual resources to teach Art and Design? Yes/No

if yes, name those AV resources:

………………………………………………...

....

2. Indicate how often you utilize these resources in your AD lesson.

Tick appropriately, (Very Frequent (**VF**), Frequently (**F**), Occasionally (**O**), Rarely(**R**), and Never (**N**).

Resources	**Level of Utilization**					**Comment**
	VF	**F**	**O**	**R**	**N**	
Desktop						
Video from You-tube						
Educational Videos						
LCD Projector						
Laptop						
Digital camera						
Tablets						
Television						
Smart Phone						
Radio						
Tape recorder						
Textbook						
Photographs						
Posters						
Chalkboard						
Posters						
Models						
Charts						
Cartoons						

3. Indicate any general comment on the use of AV resources in relation to teaching of AD in your school.

………………………………………………………………………………………

………………………………………………………………………………………

………………………………………………………………………………………

Thank you

Appendix III: Interview for School principals

You are humbly requested to participate in this study on Audio-Visual resources. This interview will be conducted at your convenience. Your participation in this study is absolutely voluntary and you are at liberty to withdraw at any time you feel like doing so.

i. What are your views about teachers using Audio-Visual resources in your school?

ii. what type of AV resources has the school provided Art and Design teachers for instruction purposes?

iii. To what extent does your school administration support Art and Design teachers to use AV resources?

iv. What are some of the issues these teachers encounter while using AV resources in instructions of Art and Design

Appendix IV: Art and Design Test 1

Theory-Painting

Answer the following questions: **Time: 40 mins**

SECTION A.

1. Define the term Painting.

   (2mks)

   ---

2. State two tools and materials used in painting. (2mks)

   ----

3. State three properties of colour.

   ----

4. Distinguish between colour harmony and colour contrast. (4mks)

   ----

5. The artwork below represents a landscape.

a) Mark the horizon and middle ground. (2mks)

b) Discuss how atmospheric perspective has been achieved in the painting. (3mks)

----

6. What is the use of a viewfinder in painting? (2mks)

7. Name the two principles of AD. (2mks)

SECTION B:

PRACTICAL

Time :1hr

PAINTING.

Instructions

You are instructed that the use of computers, geometrical instruments, tracing paper, coloured pencils and maker pens is **forbidden** in this section.

The composition should be in an area of 35 cm by 42 cm.

Question

Paint a still-life composition, of a basket full of assorted fruits on a table that is covered with a tablecloth.

The fruits **MUST** overlap.

Appendix V: Art and Design Test 2

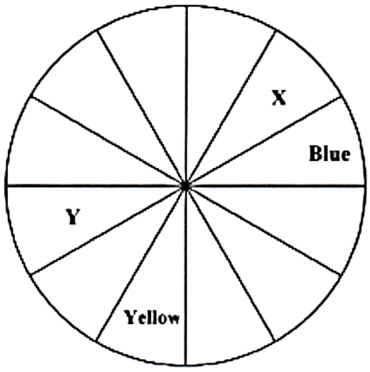
THEORY-PAINTING

Time: 40 mins

Answer the followin questions:

SECTION A.

1. Identify the colours labelled x and y 2mks



2. Define colour value 2mks

………………………………………………………………………………………

………………………………………………………………………………………

3. Using examples, explain the term monochromatic colour scheme. 2mark

………………………………………………………………………………………

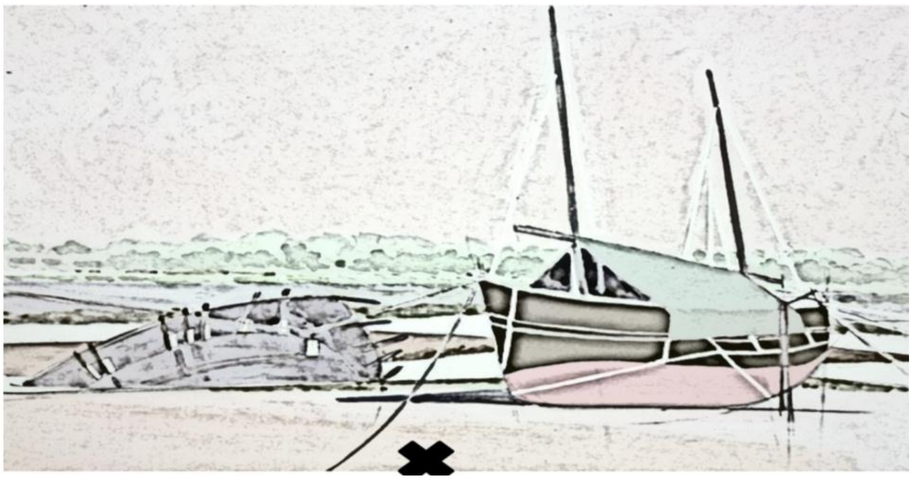
………..…………………………………………………………………………

4. Explain **wash** as a painting technique. (2mks)

………………………………………………………………………………………

………..……………………………………………………………………………

5. The picture below represents a landscape



a) Draw the horizon. (1mark)

b) Draw the vanishing points if the viewer is positioned at X. (3marks)

6. What colour will be most suitable to paint the walls for a children's play room for children aged 6-8 years. Give a reason to support your answer. (2mks)

……………………………………………………………………………………………

……………………………………………………………………………………………

7.What is the main role of **dominance** in works of art? 2mks

……………………………………………………………………………………………

……………………………………………………………………………………………..................

8 Explain two ways in which colour can be used to create aerial perspective. 2mks

…………………………………………………………………………………………

9.What is hue as used in colour? 2mks

………………………………………………………………………………………….

SECTION B

PRACTICAL

Time :1hr

PAINTING.

Instructions

You are informed that the use of tracing paper, rulers, and other mechanical devices is **permitted**. The working surface's (paper's) color will not be counted as one of the colors needed to answer the question.

Paint an imaginative composition based on the theme “beautiful sunset at the beach”

Appendix VI: Checklist

Date: ……………………………………………

Type of schools: Boys [ ] Girls [ ]

Type of Group: Experimental [ ] Control [ ]

Type of AV resources available for instruction of AD.

	Resources	**A**	**N/A**	**Comment**
Visual	Desktop			
	Video from You-tube			
	Educational Videos			
	LCD Projector			
	Laptop			
	Digital camera			
	Tablets			
	Television			
	Smart Phone			
Audio	Radio			
	Tape recorder			
Print	Textbook			
	Photographs			
	Posters			
	Charts			
2and 3D Visual	Chalkboard			
	Models			
Internet	Internet			

Overall comment:

……………………………………………………………………………………………

……………………………………………………………………………………………

……………………………………………………………………………………………

KEY: A- Available **N/A-** Not available

Appendix VII: Research Authorization

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 020-8704150

Our Ref: E55/CE/34845/2016 DATE: 27th May, 2021

Director General,
National Commission for Science, Technology
and Innovation
P.O. Box 30623-00100
NAIROBI

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR MS. MUTESHI RUTH – REG. NO. E55/CE/34845/16

I write to introduce Ms. Muteshi Ruth who is a Postgraduate Student of this University. She is registered for M.Ed. degree programme in the **Department of Educational Communication & Technology.**

Ms. Muteshi intends to conduct research for a M.Ed. thesis Proposal entitled, **"Audio-Visual Resources and their Influence on Performance of Students in Art and Design in Secondary Schools in Kakamega County, Kenya."**

Any assistance given will be highly appreciated.

Yours faithfully,

PROF. ELISHIBA KIMANI
DEAN, GRADUATE SCHOOL

Appendix VIII: Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Ref No: **897045**

Date of Issue: **21/June/2021**

RESEARCH LICENSE

This is to Certify that Miss.. Ruth Muteshi of Kenyatta University, has been licensed to conduct research in Kakamega on the topic: Audio-Visual Resources and their influence on performance of students in Art and Design in secondary schools in Kakamega county, Kenya. for the period ending : 21/June/2022.

License No: **NACOSTI/P/21/11224**

897045

Applicant Identification Number

Director General

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.