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AUDIO-VISUAL MEDIA USE AND ITS EFFECT ON THE PERFORMANCE OF LEARNERS IN PHYSICAL GEOGRAPHY IN SECONDARY SCHOOLS IN KIAMBU COUNTY, KENYA

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Abstract

Audio-Visual Media application in Physical Geography instruction in secondary schools has the possibility of enhancing understanding of concepts among the learners. Students generally find many concepts in Physical Geography abstract and therefore difficult to learn, leading to poor performance in Geography. This study sought to investigate whether, the use of Audio-Visual Media in Physical Geography instruction would have a positive effect on the learner's performance in Kiambu County, Kenya. The objective of this study was to assess the effect of using videos in the teaching and learning of glaciation in Physical Geography on the learner's performance. The study was anchored on the sensory stimulation theory of Dugan Laird (1985). It adopted a pretest-posttest type of quasi-experimental design. The study target population comprised secondary schools, the principals, Geography teachers and Geography students in Kiambu-County. Purposive and simple random sampling techniques were used to select the schools and allocate the experimental and control groups. Two public mixed day secondary

schools were selected in this study. The study sample consisted of 71 students, 7 teachers and two principals. Data collection was done through achievement tests (pre-test and post-test), classroom observation schedule and teachers' questionnaires. Quantitative data was analysed with the assistance of SPSS computer software to generate the dependent and independent t-test. The statistical significance was tested at α = 0.05 and presented using frequency Tables. The qualitative data was analysed using thematic analysis and presented in written narratives. The study found that there was a significant difference in performance between the experiment and the control group with the students in the experiment group having higher scores in their performance compared to the students in the control group after the post-test. The study concluded that the use of videos in the teaching and learning of Glaciation topic in Physical Geography had a great positive effect on students' performance, therefore, AV Media is effective in Physical Geography Instruction. Based on the findings, the study recommended that, the government provide funding for the acquisition of AV Media in secondary schools and that policy makers and curriculum designers formulate policies geared towards production of appropriate AV Media for Geography instruction.

Keywords: Audio-Visual Media, effect, learners' Performance, Physical Geography, Secondary Schools, Kiambu County

INTRODUCTION

In the 21st century, diverse technological innovations are emerging which exert considerable influence on teaching strategies and methodologies, curriculum and the classroom environment (De Vita & Tan, 2021). This was clearly demonstrated in Covid-19 Pandemic when virtual schooling was made possible as a result of prolonged shutdown of schools (King, 2022). Although technological advancement has transformed the way the teacher deliver's content significantly as noted by Meena (2020), the research is of the opinion that no meaningful learning can take place without proper instruction. The term instruction could be understood as the skill of creating an environment where teaching and learning can thrive. Zajda (2021) construes that skillful instruction is indispensable in making the learning process interesting and exciting for all types of learners. To make curriculum work for academically diverse learners, flexibility in instruction is essential. An instructional technology that could make this reality possible is the Audio-Visual Media(AV).

Olagbaju & Popoola (2020) asserts that "use of AV Media during instruction improves the quality of students' learning experiences and teachers' effectiveness. This is because concepts are easily understood as words are accompanied by animated images and the

teacher's material is presented more succinctly" (para. 7). According to Kathirvel & Hashim (2020), a compelling reason for using AV Media in modern education is that the 21st Century youth belong to the virtue age bracket. The youth experience this reality on daily basis and they love watching educational movies as opposed to reading books. Therefore, to meet their needs they recommend the incorporation of video presentations, films and power point slide shows during instruction. Geography, a subject taught in both elementary and higher levels of education due to its importance has been taught in a very conventional manner in spite of some concept being abstract. This makes some topics in Geography especially those found in Physical Geography such as Glaciation difficult for learners to conceptualise, leading to poor academic achievement. However, improvement in pedagogy could be made possible if teachers utilized the current technological innovations such as audio-visual media technology in Geography instruction (Adedokun-Shittu et al., 2020).

Research carried out in Korea by Kurniawan and Trimasukmana (2020) point to the fact that Geography presents numerous abstract theories and concepts, that require students to memorize them well and this learning style makes the subject boring and unattractive to students. The efficiency of Videos which is an audio-visual media during Geography instruction, made the scholars advocate for its application. This is also observed in the work of Rifa'i (2020) on audio-visual media application in comprehending disaster mitigation notion among geographic education students in veteranbangun nusantara sukoharjo university, Indonesia. One conclusion of the study was that the use of videos enhanced the conceptualization of disaster alleviation, a concept difficult to grasp without visualization.

Studies carried out in Nigeria indicates that, in spite of Geography being an important discipline as it facilitates the understanding of our physical surroundings as well as human progress, Geography instruction is marred by several issues such as verbal explanations of seemingly abstract concept, making the subject quite uninteresting to learners. This ultimately results into learners' low achievement in Geography examinations (Abubakar et al., 2023). To demystify the content, increase motivation and consequently improve learner's performance in Geography, the scholars recommended employment of AV Media during Geography instruction. In Tanzania Secondary Schools, an analysis on the use of videos in Geography instruction indicates that utilization of well selected videos for Geography instruction ought to be reinforced because it promotes comprehension of the topics. The research recommends the insertion of videos in Geography course books or teaching materials in form of recorded VCD'S or DVD'S formats for all topics by the syllabus designers (Mgona, 2013).

In Kenya, research has also demonstrated that Geography performance in schools fluctuates from year to year because some concepts and topics in Geography are

incomprehensible to the learners. It has been difficult to improve the learner's performance because Instructional Media such as AV which makes learning more fascinating and intriguing to the learners has not been fully embraced and in many cases it is used infrequently in Geography instructions (Omungo, 2022). A number of teachers in secondary schools acknowledged the adeptness of AV Media during instruction, but they continued using textbooks and chalkboards during lesson delivery (Ruth, 2023). This has had adverse effects on student's performance in Geography which may have a number of consequences such as, low self-esteem, a general laxity in studying Geography and low overall mean grade in KCSE examinations. This also hinders some students from pursuing careers which require one to have excelled in Geography such as survey, aviation, architecture, wildlife and tourism, cartography, among others (Kipsaat, 2016). Considering the capability that AV Media has in transforming classroom environment and enhancing instruction, it was worthwhile to conduct a study to assess whether its application would improve the performance in Physical Geography. This study was centered on the use of videos in the instruction of Glaciation in Physical Geography in Kiambu County, Kenya.

Statement of the problem

Geographical Knowledge and skills are essential to every learner because, they facilitate understanding of the physical and cultural environment around the world. For its importance, the Kenyan government has not only made Geography an examinable subject in the school curriculum, but also endeavored to supply instructional materials for instructional purposes in the subject. A proposition by a majority of education practitioners' points to the fact that effective instruction could be achieved through the use of AV Media formats such as videos to simplify complex concepts as those found in the topic of glaciation in Physical Geography.

However, there is inadequate application of technologies such as AV Media in the traditional classroom setting which makes teaching and learning very boring and uninteresting for the 21st Century learner, in Kenya and other developing countries. These learners have been born at a time when technology has grown exponentially, therefore they have opportunities to interact with different gadgets on a daily basis. Professionally, experience has shown that the generic of low performance in Physical Geography has been a lack or partial understanding of perhaps abstract concepts that are found in topics such as glaciation. Experience has shown that in most cases, the subject content is detached from real world experience.

This disconnect erodes learners interest and motivation and as a consequence their performance is affected adversely. At the same time, professionals have recognized that there is a possibility of bringing an environment which is geographically far away or remote to the

learner direct into the classroom with the use of modern invention of technology, particularly the Audio-Visual Media. This is imperative in the instruction of Physical Geography. Previous studies suggest that application of AV Media can enhance students' learning and teachers' effectiveness. However, there is lack of structured information on the use of AV Media in the teaching and learning of Physical Geography and its effect on students' performance in public secondary schools in Kiambu County, Kenya. This provided the study an opportunity to fill in the salient gap.

Specific objective

To assess the effect of using videos in the teaching and learning of Glaciation in Physical Geography on the learner's performance.

Research question

What is the effect of using videos in the teaching and learning of glaciation in Physical Geography on learner's performance?

THEORETICAL FRAMEWORK

The Sensory Stimulation Theory, by Dugan Laird (1985) supported this study. Laird postulates that there are higher chances of learning when several senses are stimulated and hence a learning environment should be enhanced by incorporating visuals and sounds. This multi-sensory atmosphere will captivate the learner's attention, accelerate their engagement, heighten their retention and increase their capacity to recall things and transfer the lesson learnt into real life situations. Consequently, the learner may acquire creativity, critical thinking and problem solving skills. Therefore, this theory forms a strong basis for integrating Audio-Visual Media such as videos, slideshows and films among others in topics such as Glaciation found in Physical Geography to facilitate assimilation of abstract concepts. Additionally, the constructivism theory of learning that asserts that, learners construct knowledge in their minds rather than passively take in information has been used to complement Laird's theory. According to the constructivist, people build their own images and integrate new information into their prior knowledge (Schemas), based on their experiences and reflection about the world (Bada & Olusegun, 2015). Therefore, students learning is enriched through active engagement as opposed to passive reception of information. The teacher should hence act as a facilitator by creating an environment where students can acquire experiences that enhance construction of knowledge rather than being a mere disseminator of information. The selection and effective

use audio-visual media during instruction can facilitate the active engagement of students in a lesson and this environment can accelerate the learning process.

REVIEW OF LITERATURE

An effective teacher is one who is likely to give serious thought to how he/she prepares her lessons in terms of establishing the learner's entry behavior; setting appropriate lesson outcomes; arranging content and developing learner experiences to meet the stated outcomes; and finding, selecting or developing materials in order to enhance the learners understanding of content (Altun, 2017). With the aim of achieving this end, MacKay et al. (2023) argues that a collection of relevant resources is necessary on the part of the teacher so as to reap the greatest possible benefit. The enormous contribution that technology would bring to education practices has been articulated by scientist and policy makers since the 70s. Hence, it is fitting for teachers to adopt appropriate and relevant new technologies in their Geography classrooms because, recent scientific research may enhance the understanding of Geography concepts (Cemalettin, 2015). As observed by Mozaffari et al. (2020), learners learn in a variety of ways and this has a bearing on their academic achievement. When a verbal presentation is linked with visual and audio features, a majority of students learn faster.

Arundele as cited by Abubakar et al. (2023) further explains; If a teacher finds it arduous to equate concepts described with those that the students are acquainted with, then there is no certainty that his/her verbal narrative will transmit the correct meaning. He proposes mediated instructions as a way of overcoming such challenges. Moreover, inappropriate use or complete removal of visual teaching and learning materials in Geography lessons can have negative consequences on students' performance (p.18).

Kurniawan (2016) further points out that, AV resources are regarded as a crucial means for expanding efficiency during instruction because of their compelling and captivating nature that increases depth in learning. Thus, in technological world, instructional media technologies such as AV are essential during instruction at all levels of education. AV Media technology "provides stimulating experiences which serves as a basis of thinking, reasoning and problem solving. It increases the initial learning and permanency of learning" (Ritakumari, 2019, p.9). This has been complemented by Dale as quoted by Lee & Reeves (2017) who concluded that "audiovisual materials could provide a concrete basis for learning concepts, heighten students' motivation, encourage active participation, give needed reinforcement, widen student experiences and improve the effectiveness of other materials" (p.23).

According to Akram et al. as cited by HO and Intai (2017), when teaching theoretical concepts and describing incorporeal objects, the use of teacher-centered approach becomes

limited. For instance, it may be easier for a learner to visualize, retain and critically think about the topic of the solar system and aspects such as the effect of rotation and revolution of the earth, if the teacher incorporates a video in such a lesson. It will also save on the teacher's time and energy in tackling such a topic because a video can be projected to a huge population of students who receives the same content at the same time and the concepts are explained in a simplified manner.

Studies done in Indonesia and Malaysia by Fuady and Mutalib (2018), suggests that, a properly selected media comes in great support of the learning process. A media that combines both visual and audio characteristics certainly surpasses other types of media and can be strongly appealing to the students. This enhances the student's interest and assimilation of the subject matter. In support of application of Audio-Visual Media Getis and Jain as cited by Omungo (2022) opines; Ability to display animated graphics through the internet makes it a stimulating instructional tool for explaining complex phenomena in physical geography. For instance, fundamental concepts such as Coriolis Effect and Hadley circulation need to be learned before a student can be expected to understand global atmospheric circulation. Although spatial temporal in nature, these fundamental concepts have traditionally been taught using static images such as those found in introductory physical geography text books. AV Media can be used to display animated graphics, allowing students to view moving simulations of these concepts (p.165).

As noted by Owusu (2020), the productivity of technologies such as audio-visual devices in the learning process can only be realized if educational needs are analysed. The quality of information and gadget produced should be user friendly to the teachers and students otherwise they become obstacles to the process of instruction. Furthermore, Ojobor et al. (2020) stressed that audio-visual media, such as videos, when competently used have the capacity to supplement teacher's expressions, facilitate the introduction of a new topic in a dynamic manner, save on time, give accurate views at the beginning and invigorate and energize the curriculum. Physical Geography requires teachers to bring specimens in class or take the learners on field trips to make learning real. This is because, students learn best when the teaching is supported by concrete and real or actual objects or scenery which give first-hand knowledge and learning experiences. However, inadequate time and finances which are experienced frequently in public secondary schools make it impossible almost always. Therefore, the use of AV Media becomes paramount because those learning experiences could be brought into the classroom by use of a well selected video or film and this could help to clear difficulties of apprehensions on the part of the learners by simplifying explanations using vivid motion images for illustrations.

As observed by Mkpa as cited by Muhammad-Jamiu (2023), intelligent use of AV Media, provides a compelling class atmosphere because some essential concepts which appear difficult, hazy, fake, boring, darkened and deprived of meaning can be illuminated, animated and humanized. The quality of Geography teaching is anchored on effective use of AV resources because it helps to build strong cognitive structures among the learners which when used in their daily life experiences, would transform them into better problem solvers (Alemnge & Andongaba, 2021).

METHODOLOGY

The study adopted a pretest-posttest type of quasi-experimental design. The research used multiple sampling techniques under the quasi-experimental design that allows use of experimental and control groups to determine cause-effect relationship between the independent and dependent variables (Rogers & Revesz, 2020).

Sampling

The study was conducted in Kikuyu Sub-County, Kiambu County, Kenya. Two mixed day public secondary schools were selected purposively for this study. Simple random sampling was used to select two form three Geography classes. One class was assigned to experimental group and the other the control group. Form three Geography teachers and principals were selected purposively for the study purpose. There are twelve (12) mixed day public secondary schools in Kikuyu Sub- County, Kiambu County and out of these, a sample size of two (2) schools were selected for the study. The number of principals selected consisted of a sample size of two (2), corresponding to the sampled schools. A sample size of seven (7) teachers was selected out of a target population of twenty-five (25) Geography teachers in mixed day public secondary schools in Kikuyu Sub-County. The target population of form three Geography students was about Three hundred and sixty-two (362), which corresponded to a sample size of seventy-one (71) students since Geography is an elective subject in these schools. Normally in experiments, sample size is small to collect precise and exhaustive data (Creswell & Poth, 2016). The lesson observations were done in the selected form three Geography classes. The study collected both quantitative and qualitative data.

Data Collection Instruments

This research used the following study instruments; an open and closed ended teacher questionnaire, a Pretest Geography Achievement Test, a Post-test Geography Achievement Test and classroom observation schedule. The teacher questionnaire consisted of open and

closed ended items and was administered to collect both qualitative and quantitative data (See Appendix I). The pretest and posttest Geography Achievement Tests were prepared using the KNEC Geography syllabus to ensure standardization. The items of the pre-test were administered before the treatment while those of the Post-test were administered after the treatment and were obtained from the topic of Glaciation. They contained structured and unstructured questions with varied scores in every test items all totaling to forty marks (See appendix II and appendix III). The classroom observation schedule enabled the research to observe teachers' and learners 'perceptions regarding AV Media use during the lessons. In each school, the lesson observation was done two to three times without disrupting the teaching timetable (See appendix IV).

Data Collection Procedure

The research received an introduction letter from Kenyatta University to obtain authorization for data collection. A permit from National Commission of Science, Technology and Innovation (NACOSTI) was sought and granted prior to the study. The permit was presented to the County Director of Education (CDE) Kiambu County and the Director of Kikuyu Sub-county and official letters were obtained, which enabled the researcher to visit secondary schools under CDE's jurisdiction for data collection. The letters were presented to the principals of the selected schools, who in turn gave consent for data collection. The researcher requested for an introduction to the Geography teachers and Geography students in form three classes from the principals. This helped to create a rapport with the respondents. The study set tentative dates with the teachers for actual data collection. The research then methodically administered the research instruments and collected data.

Data Analysis

The Statistical Package for Social Sciences (SPSS) version 28 used for data analysis. In this study, both quantitative and qualitative data was collected for analysis. Quantitative data collected from closed ended questionnaires and Geography achievement tests was processed by coding, classifying and analyzing using descriptive analysis where measures of central tendency (mean), measures of dispersion (standard deviation), frequencies and percentage were applied for the variables. Tables were used appropriately to present the data findings with interpretation, as well as comprehensive discussion of the findings. Qualitative data obtained from open ended questionnaires and classroom observation schedule was analysed using content analysis, through developing a thematic framework from the key issues, concepts and themes. The results for qualitative analysis were presented through narratives and discussions.

RESULTS

The study sought to assess whether the use of videos during instruction of glaciation in Physical Geography had an effect on the learner's performance. To this end the study used student's achievement tests, classroom observation schedule and teacher's questionnaires under the following sub-headings.

Teachers' Perception regarding Use of AV Media in Physical Geography Instruction

To find out the perception of teachers regarding the use of AV Media in Physical Geography instruction on learners' performance, the research required the teachers to state a yes or no answer against each statement. Teachers' responses are shown in the Table 1.

Table 1: Effect of Audio-Visual Media Use in Physical Geography

Statements	Yes	No
Attract and retain learners' attention during the lesson	6	0
Generates interest across students with different learning styles	6	0
Makes lessons more interactive and interesting	6	0
Helps the learners develop essential components in the process of teaching-learning such as critical thinking and reasoning.	5	1
It facilitates the focus on student-centered approach	5	1
Makes the lesson more dynamic and effective	6	0
Introduction of new topics is made possible in an easy manner	6	0
Retention of concepts by students is prolonged	6	0
Since all the learners' attention is captured during instruction discipline is maintained	4	2
Improves learners' performance	6	0
Communication between teacher and student is enhanced	4	2
Improves the quality of learning	6	0
Excites the students but facilitates little learning	1	5
Helps improve learners' comprehension of topics because words are complemented by images and animations	6	0
Makes learning more compelling and therefore enhance in-depth assimilation of concepts	6	0
Helps in demystifying abstract concepts	6	0
Improves students' attitude towards difficult topics	6	0
Makes some students get bored in class and switch-off from the lesson	1	5

According to Table 1, all teachers agreed with the following statements: AV Media attract and retain learner's attention during the lesson, generates interest across students with different learning styles, make lessons more interactive and interesting, it enhances the dynamism and effectiveness of the lesson, Introduction of new topics is made possible in an easy manner, retention of concepts by students is prolonged, improves learner's performance, improves the quality of learning, helps improve learner's comprehension of topics because words are complemented by images and animations, make learning more compelling and therefore enhance in-depth assimilation of concepts, helps demystify abstract concepts and improves students attitude towards difficult topics as shown by the highest percentage (100%). All the teachers with the exception of two disagreed with the following statements; use of AV media excites the students but facilitate little learning and makes some students get bored in class and switch-off from the lesson. A majority of the teachers (83%) agreed that, use AV media during instruction helps learners develop essential components in the process of teaching and learning such as critical thinking and reasoning and it facilitates the focus on student-centered approach.

The results concur with conclusion made by Kurniawan (2016) that, AV resources are regarded as a crucial means for expanding efficiency during instruction because of their compelling and captivating nature, that increases depth in learning. The results also agree with Ritakumari (2019), who acknowledges that, AV Media technology "provides stimulating experiences which serves as a basis of thinking, reasoning and problem solving. It increases the initial learning and permanency of learning" (p.9). Further, a study carried out in Rwanda by Mugisha (2020), to access effect of instructional resources on learning Geography revealed that, when instructional resources are used frequently and consistently in Geography instruction, they captivate learner's attention, awaken learner's interest in learning, reinforce learner's comprehension of concepts and improve student's academic achievement.

There were differing opinions among the teachers on the following statements; since all the learner's attention is captured during instruction, discipline is maintained and communication between teacher and student is enhanced. 67% of the teachers agreed, while 33% disagreed with the statements. However, the differing opinions were not significant to warrant a serious discussion in this study.

This research confirmed that Geography teachers had a positive perception regarding the use of AV Media in Physical Geography instruction, despite using them sporadically as noted during the classroom observations. Therefore, provision of adequate AV Media, coupled with constant fine-tuning of teacher's technical knowledge and skills is paramount to building teacher's confidence in the use of AV media during Geography instruction.

Effect of AV Media Use on Geography Student's Academic Achievement

To assess the effect of AV Media application on student's performance in the topic of Glaciation in Physical Geography, the study conducted a descriptive analysis of Physical Geography performance scores and then went ahead to analyse the scores using inferential statistics.

Descriptive Statistics of Physical Geography Performance

Two achievement tests with a score of 40 marks each, were administered to the experiment and control groups. To ensure the comparability of the groups, a pre-test was administered to assess their initial knowledge of the topic before the intervention. The results of the two groups were compared independently, and a descriptive analysis was conducted, as shown in Table 2.

Table 2: Pre-Test Mean Scores and Standard Deviation of the Experiment and Control Groups

Group	N	Mean	Standard Deviation (SD)
Experiment	36	8.31	4.22
Control	36	7.97	5.35

Table 2 shows the analysis of the pre-test in terms of mean and standard deviation. The results show that, the experimental group had a mean of 8.31 and a standard deviation of 4.22 while the control group had a mean of 7.97 and a standard deviation of 5.35. This means that the difference in their performance was small. Therefore, their performance was comparable because of the similarities. Comparability of the experiment group and control group is fundamental in a quasi-experimental design. Afterwards, the experiment group was taught using videos in the topic of Glaciation as a method of intervention by their Geography teacher while the teacher in the control group taught using conventional methods. A post-test was then administered to the two groups and the results were analysed using descriptive statistics as shown in Table 3.

Table 3: Post-Test Mean Scores and Standard Deviation of the Experiment and Control Groups

Group	N	Mean	Standard Deviation (SD)
Experiment	36	13.86	4.56
Control	36	9.14	4.77

As shown in Table 3, the mean score and standard deviation of the experimental group was 13.86 and 4.56 respectively while the mean score and standard deviation of the control group was 9.14 and 4.77 respectively. The results show that there was an improvement in performance after the post-test in the two groups, but of different magnitudes. The experimental group improved by a big margin while the control group improved slightly. This shows that the intervention had a high impact of students' performance.

Inferential Statistics of Physical Geography Performance

Similarly, a paired and unpaired t-test were conducted to establish whether the differences in the scores before and after the intervention in the two groups was statistically significant. The paired t-test (dependent) compared the within-group change from pre-test to post-test, while the unpaired t-test(independent) compared the between-group difference from the pre-test or the post-test. The results are shown in Table 4 and Table 5.

Table 4: Dependent t-test of the Experiment group and Control group

	PRE-TEST	**POST-TEST**		
	M (SD)	**M (SD)**	**t-test**	**P-value**
Experimental Group	8.31 (4.22)	13.86 (4.56)	-7.789	1.88E-09
Control Group	7.97 (5.35)	9.14 (4.77)	-1.464	0.08

The findings of the t-test at 0.05 significance level in Table 4 reveal that, in the experiment group, there was a statistically significant difference before the intervention *(M = 8.31, SD = 4.22)* and after the intervention *(M = 13.86, SD = 4.56)* in the students' scores, t (35) = -7.789, p= 1.88E-09 (p< .05). In addition, the effect size was obtained to be 1.26, which was large. According to Sawilowsky (2009), an effect size of 1.2 is considered large. This large effect size indicates that the use of AV media had a substantial positive impact on student's learning outcomes. No significant statistical difference was realised in the control group before (*M = 7.97, SD = 5.35)* and after *(M = 9.14, SD = 4.77)* application of the conventional methods of learning, t (34) =-1.464, p=0.08. The effect size was found to be 0.23, which was small. According to Sawilowsky (2009), an effect size of 0.2 is considered small. This indicates that conventional methods of teaching had a minimal impact on student learning outcomes.

The results show that the control group did not attain a significant improvement in their knowledge of Glaciation in Physical Geography after being taken through traditional methods of instruction. On the other hand, the results indicate a significant improvement with a large effect size in the scores of students from the experimental group. Therefore, the results suggest that

using videos to teach glaciation had a positive effect on students' performance, indicating that AV Media may be a more effective instructional method for this topic compared to traditional methods.

Table 5: Independent t-test of the Experiment group and Control group

		Control	Experimental			
		M(SD)	M(SD)	t-test	df	p-value
Unpaired	**Pre-test**	7.97 (5.35)	8.31 (4.22)	-0.292	69	0.772
	Post-test	9.14 (4.77)	13.86 (4.56)	-4.26	69	6.39E-05

The findings of the t-test at 0.05 significance level in Table 5 shows that, the performance of the control group (*M = 7.97, SD = 5.35),* and the experiment group *(M = 8.31, SD = 4.22),* were similar before the intervention, t (69) = -0.292, p= 0.772. After the intervention, there were variations in the performance between the two groups. The 36 students in the experiment group on whom the treatment was administered (*M=13.86, SD=4.56),* compared to the 35 students in the control group *(M=9.14, SD=4.77),* demonstrated a significant improvement in their performance (t (69) = -4.26, p= 6.39E-05 (P< .05). The results suggest that use of videos in the instruction of Glaciation in Physical Geography was an effective method of teaching and learning because it had a positive effect on student's performance. This may be an indication of AV Media effectiveness as a method of instruction in Physical Geography as compared to traditional methods of teaching.

CONCLUSIONS

The study found that student's performance improved significantly when videos were incorporated in the teaching and learning of Glaciation. Therefore, the use of videos in the teaching and learning of Glaciation topic had a great positive effect on students' performance, indicating that AV Media may be more effective in Physical Geography instruction as compared to traditional methods of teaching.

The deduction made from the significant improvement in the performance of Geography students after the utilization of videos during instruction is that, indeed use of AV Media has a positive effect on students' performance. Moreover, appropriate and effective application of AV Media provides alternative ways of processing information, increases visualization, critical thinking and retention, enhances the ability to connect concepts properly, captivates learner's attention, awakens learner's interest in learning, reinforces learner's comprehension of concepts and improves student's academic performance. Therefore, the provision of adequate AV Media may achieve considerable success in students' academic life.

RECOMMENDATIONS AND SCOPE FOR FURTHER STUDY

The Geography teachers should strive to apply innovative teaching strategies and methodologies such as effective integration of AV Media in Geography instruction. This will make learning less complex and more appealing because of the possibilities of demystifying seemingly abstract concept found in Physical Geography through the use AV Media. This might enhance the learner's interest and motivation in learning Physical Geography for its own sake and eventually boost the overall performance in Geography. In addition, the policy makers and curriculum designers in KICD, should formulate policies geared towards production of appropriate AV Media for Physical Geography instruction. This could entail production and dissemination of audio-visual media with relevant content for each topic in Physical Geography in secondary schools since you-tube videos may not meet the specific needs of each topic.

This study was limited to Kikuyu sub-county in Kiambu County, a similar study could be conducted in other counties and sub-counties in Kenya for comparison purposes. This research was also limited to the use of videos in the instruction of Glaciation in Physical Geography, further studies could be done in other Geography topics using other AV Media tools.

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APPENDIX I: QUESTIONNAIRE FOR GEOGRAPHY TEACHERS

Kindly fill in the spaces provided or tick as directed.

SECTION A: Demographic information

1. Gender: Male [ ] Female [ ]

2. Experience in teaching Geography. 5-10 years [ ] 11- 15 years [ ] 16-20 years [ ] over 20 years [ ]

SECTION B: Effect of Audio-Visual media resources in the teaching and learning of Physical Geography

Please indicate a yes or no response to the following statements

Effect of audio-visual media resources on learners performance	**YES**	**NO**
Attract and retain learners' attention during the lesson		
Generates interest across different levels of students		
Makes lessons more interactive and interesting		
Helps the learners develop essential components in the process of teaching-learning such as critical thinking and reasoning.		
It facilitates the focus on student-centered approach		
Makes the lesson more dynamic and effective		
Helps to introduce new topics in an easy way		
Makes the students remember the concept for longer period of time.		
Since all the learner's attention is captured during instruction discipline is maintained		
Improves learner's performance		
Provides opportunities for effective communication between teacher and students in learning		
Improves the quality of learning		
Excites the students but facilitates little learning		
Helps improve learner's comprehension of topics because words are complemented by images and animations		
Makes learning more compelling and therefore enhance in-depth assimilation of concepts		

Helps in demystifying abstract concepts		
Improves students attitude towards difficult topics		
Makes some students get bored in class and switch-off from the lesson		

How can you make better use of the AV resources available in the school for Physical Geography instruction?

_____

APPENDIX II: PRETEST GEOGRAPHY ACHIEVEMENT TEST

FORM 3 GEOGRAPHY TEST ON GLACIATION

Name: _____

School: _____

Answers all questions in the foolscap provided

1. (a) (i) What is an ice sheet? (1mk)
2. (ii) Give two reasons why there are no ice sheets in Kenya. (2mks)

(iii) Explain three factors that influence the movement of the ice from the place where it has accumulated (3mks)

3. (a) i) Describe how ice is formed on a high mountain. (5mks)

ii) Apart from a valley glacier, name two types of ice masses found on Mountains in East Africa. (2mks)

(b) Explain how the movement of a valley glacier is influenced by the following factors:

(i)Temperature (2mks)

(ii)Width of a glacier channel (2mks)

4. (a) Describe plucking as a process in glacial erosion.

(5mks)

(b) Explain three factors that influence glacial erosion. (6mks)

(c) With the aid of diagrams, describe how the following features are formed; (6mks)

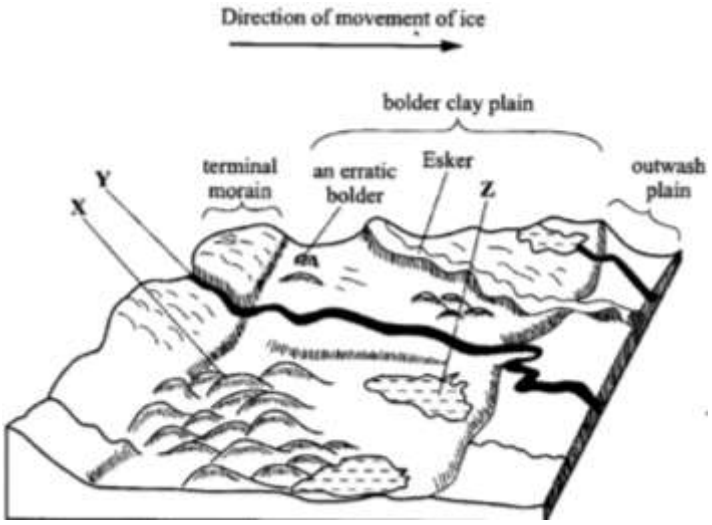
(i) Pyramidal peak

(ii) Cirque

(iii) U-shaped valley

4. (a) The diagram below shows features resulting from glacial deposition on a lowland area. Label the features marked X, Y and Z.

(3mks)



APPENDIX III: POSTTEST GEOGRAPHY ACHIEVEMENT TEST

FORM 3 GEOGRAPHY TEST ON GLACIATION

Name: _____School: _____

Answers all questions in the foolscap provided

1. (a) Name the features marked P, Q, and R in the picture attached. (3mks)

   (b) How is a U-shaped valley formed? (3mks)

2. (a) i) What is a glacier? (1mks)

   ii) Distinguish between valley glacier and ice sheets. (2mks)

3. (a) Name **two** mountains in East Africa that are ice capped. (2mks)

   (b) Identify **three** ways in which ice moves (3mks)

   (c) List **two** erosional features in glaciated lowlands (2mks)

4. (a) Describe how each of the following feature is formed.

   (i) Outwash plain (4mks)

   (ii) Roche Mountonne (6mks)

   (b) Outline the significance of glaciated upland areas to human activities. (5mks)

5. (a) Explain **three** conditions that lead to glacial deposition (6mks)

(b)Highlight three positive effects of glaciation in lowland areas. (3mks)

APPENDIX IV: CLASSROOM OBSERVATION SCHEDULE

The purpose of this instrument is to determine the effect of AV Media use on teachers and learners during the teaching and learning process. It is to be filled by the researcher during classroom observation while the lesson is ongoing.

School……. Class……Date……. Time……. Topic……...

	Types of AV Media Resource	CRITERION	COMMENTS
A.	**AUDIO-VISUAL RESOURCES** 1) Overhead Projector 2) L.C.D 3) Videos 4) Television 5) Films 6) PowerPoint presentations 7) Computer 8) DVDs	1.Which of the listed AV resources did the teacher bring to class? 2. Were they functioning well? 3. How did the teacher use them in class? 4. What effect did they have on the teacher and students during the lesson? 5. Did the teacher achieve the lesson objectives?	