Effects of Hypermedia on Learning Achievement in Geography for Hearing Impaired Learners in Mixed Special Secondary Schools in Kenya

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ABSTRACT

The hearing impaired (HI) students often encounter communication problems in classroom. Yet some specific media can facilitate and enhance their learning. This study reports on the development of hypermedia educational instruction that supports HI student's achievement in Geomorphology. The objectives were; find out the achievement of students exposed to hypermedia lesson in Geomorphology, gender disparity, determined changes on the role of both students and teacher.The study was informed by multiple intelligence and cognitive theory of multimedia learning regarding individual differences and strength of the brain to store well and recall images as opposed to text. The study assumed a pragmatic research paradigm adopting mixed methods using quasi experimental approach involving Solomon four nonequivalent control group design. Simple random sampling procedure was used to obtain four schools, two for experiment and two for control group. Data collection instruments were pre-test, post-test and questionnaire. Data were analyzed using descriptive and inferential statistics. The results revealed that use of hypermedia for teaching HI resulted in higher achievement, girls improved more than boys, there are changes in role; students from passive to active, teachers from dispenser of knowledge to facilitator. Hypermedia allows interaction and self-learning. These findings may create awareness and need for integrating hypermedia in pedagogy for improved performance, thus helping learners to focus attention that promotes teachers' instructional technique. The following recommendations were made; review of curriculum and digitize HI content, improve ICT infrastructure and facilities.
Key words:Hypermedia, Geomorphology, Hearing Impaired,Achievement

INTRODUCTION

The world is moving very fast into a digital multiple periods in an environment characterized by ICT with its tenets that can improve achievement and change roles in teaching and learning process. Disability has largely been invisible in the instructional implementation, and is rarely

included in national policies and programmes, This has perpetuated a situation in which environmental barriers are still preventing persons with disabilities from accessing, participating and being fully-included in education activities.

Hearing impairments (HI) present challenges to quality education both pedagogically and logistically. Many of the learning strategies used by teachers tend to be audio based. Many HI learners across Kenya cannot benefit fully from a traditional instruction because of hearing impairment which limits their ability to actively participate in classroom learning activities. Sign is a visually-based, not auditory, code with a grammar different from that of written for example ''processing land instead of land processing''. Deaf students often miss out on secondary learning opportunities that are afforded to hearing peers (Parton, 2006). Fgatabu (2013) found that sign language has a great effect of performance on learners with hearing impairment. One of the main goals of Education in Kenya is a right to provide equal educational opportunities to every child, irrespective of their real or imagined disabilities, (EFA, 2004). Inclusive ICTs can enable persons with disabilities as agents and beneficiaries to fully access education, skills training, employment opportunities and among others. When information is available in various forms (alternative formats), it reaches everyone who may be interested. Hypermedia also caters to various learning styles and individual learning needs by providing information in a multitude of media formats.

Traxler (2010) asserts that about 50% of a national sample of students with HI at high school produced results that were below basic proficiency level. Bashir et al. (2014) denotes that in a research on the academic achievement of students with HI show that they trail behind their hearing age mates at the same age and grades as regards what is expected of them. Adoyo (2004) affirms that deaf students in Kenya have consistently trailed behind their hearing counterparts in academic performance. As essential factor for effective technology integration is the teacher, since she/he directly indicates the best instructional practices for his/her students (Rehmat, 2014). The teacher should become one of many resources that the student may learn from, engage students in experiences that challenge previous conception of their existing knowledge, allow students responses to drive lesson and seek elaboration. Success hypermedia integration is what makes a difference in reforming a classroom.Therefore Adesina (2009) and Obanyan (2010) come to a conclusion that teachers are the key pointers and determinant of a successive education. They make practical choices of tools and media that will shape the way students learn, express themselves and perform (Drayton, Falk, Hobbs, Hammerman, & Stroud, 2010. Northern Environmental Education Development (2011) presents new opportunities to develop resources such as hypermedia to shape teaching and learning. Debates still exist as to the pedagogical value of many hypermedia applications and, despite multiple experiments, researchers have failed to resolve many of the basic issues concerning the use of this technology for instruction. The objectives were; find out the achievement of students exposed to hypermedia lesson in Geomorphology and gender disparity.

Problem statement
There is increasing concern with poor academic performance in Kenyan schools for the deaf. Kiboss (2012) found that Kenyan high school student with hearing impairment scored lower in math tasks. Adoyo (2014) indicates that poor performance is attributed to inappropriate teaching methods, like in traditional classroom settings where the teacher will begin class by answering

questions from the previous work, then teach the new lesson, give notes and sometimes give assignments. On the other hand special schools are segregated and discriminated against yet classroom achievement is low (Mulambula et al, 2012). Studies reveal lack of instructional materials yet effective teaching contributes to 75% of good academic achievement. It is also evidenced that teachers' use of 85% adapted technology and 25% adapted ICT in pedagogy cannot be realized in a dilapidated instructional environment (EU Report, 2012). Other studies consider KSL as a medium of instruction may also contribute to poor performance because exams are set in English, switching between KSL to English may cause misunderstanding (Adoyo, 2001, 2004, Ogada, 2012). Based on the constraints of the typical HI student, the teaching strategies and material used in curriculum for HI student cannot effectively teach the required geographic skills. The previous research shows that hypermedia instruction embodies all instructional forms that accommodate the needs and disabilities of different hearing impaired learners (Andrei et al., 2013), therefore can alleviate this issue in physical Geography. Chickering&Gawson (2011) emphasized that active classroom involvement is not just sitting and listening to the teacher sign but by talking about what they learn, write about it, relate it to past experience and apply it to their daily lives. Teachers need to use alternative media with individual work so that the deaf student does not need to concentrate for long time. To rectify this, teachers need to integrate appropriate image- based and iterative strategies necessary for effective instruction of these students (Lang &Pagliaro, 2007).

LITERATURE REVIEW
Technology has changed the way we teach and learn. Many learning theories can be used to apply and integrate this technology more effectively. Shatila (2015), humans are their own agents of change because they are in charge of choosing their action. Hypermedia leads to a cognitive pattern of engagement and motivation of instructional tools, which individualizes the mode of delivery, developing special teacher, fortifying the teaching process and encouraging students to stay on task (Kazan, 2015). But hypermedia allows the teacher to expand his/her methods, tools and strategies beyond that are frequently used in the classrooms. The most important features in the development of hypermedia for HI are video, animation, text and graphics. In relation to this theory, visual cue is the most important element in developing the hypermedia for the HI learners (Faizah&Ariffin, 2010). MI theory has the capacity to solve problems encountered by HI learners as they have different disabilities for example in a class a teacher may be having deaf, loss of hearing, deaf and hard of hearing these may have different degree of profoundness. But hypermedia gives opportunity to choose which way to go.

METHODOLOGY
The study assumed a pragmatic research paradigm as data was collected systematically using quasi experimental approach. It adopted a mixed method (MM) of inquiry in a transformative procedure (Creswell, 2013). The study used quasi experimental design involving Solomons' four non-equivalent control group design. It was conducted in Kenya in East Africa. The target population were twenty hearing impaired mixed special secondary schools in Kenya. There are twenty principals, forty Geography teachers, 835 students and NGOs. The four schools were randomly a signed to experimental and control groups. A total of 79 students and10 teachers were sampled. The instruments such as questionnaire and Geography achievement test (GAT) were used to collect

data. Validity were ascertained by the experts and reliability conducted in two schools through test-retest method. Descriptive analysis was used to summarize data, which was presented in tables. Inferential statistic involving chi-square and t-test for testing hypothesis were employed.

RESULTS AND DISCUSSION
Integration of Hypermedia and Students Academic Achievement
The experimental group was exposed to hypermedia and control taught by regular method of teaching (RMT). The finding recoded high mean scores gain (47.07%, 42.13%) by the experimental group who achieved statistically significantly higher scores in the GAT than control group as revealed in table 1. This is in line with Parton (2006) who identified five ways that hypermedia application can promote achievement and learning for students who are deaf. These include; improving accessibility, instructional design, promoting development and creating discovery learning. All these put together leads to higher scores than those taught without use of hypermedia.

Table 1: GAT Pre-test, Post-test Means and Standard Deviation

Variables		Pre-test		Post-test	
Method	N	Mean	Sd	Mean	Sd
Conventional C_1	15	48.07	9.1	47.07	8.6
Conventional C_2	23	___	___	42.13	8.7
Use of hypermedia E_1	21	43.62	8.0	54.71	8.5
Use of hypermedia E_2	20	___	___	53.2	9.3

N= 79

To establish whether there is any significant difference in achievement between students exposed to hypermedia and those taught through conventional method. The achievement of the students on concept is attributed to several factors. To minimize on the effect of intervening variable, it was important to establish behavior of two groups and compare the results with the group whose entry behavior were not established. Pre-test was administered to two groups, one from control and the other from experimental. Before the use of any media, the entry behavior must be established. Pretest itself is an intervening variable because it prepares the subjects for what is expected at the end of the exercise. However pre-test did not have significant. As shown in table 1, there is no evidence on the means that the subjects had prior knowledge. Pre- test had a mean of 48.07 and posttest 47.07, and experimental pre-test mean was 43.63 and posttest 54.71. The increase in mean was probably due to treatment for one month. Hypermedia is an instructional media capable of improving achievement especially for the HI learners who are visual learners. It allows the students to engage more fully with the subject matter at hand and facilitates deep understanding. The finding concurs with Schmidt et al. (2009) who affirm that hypermedia has ability to develop important understanding and reasoning skills such as critical thinking, problem solving and priotization.

Pre-test Data Analysis
Table 2 reveals that Geography means score of experimental and control groups on pre-test GAT means scores were analyzed using t-test for independent samples analysis. The results indicates that control had (M=48.07; SD=8.6) and experimental registered (M= 43.6; SD= 8.0). These scores

are relatively low, this could be attributed to the fact the topics are abstract and terminologies are difficult to explain effectively in KSL. Several scholars postulate that poor performance has been attributed to poor teaching strategies and medium of instruction for the HI learners (Adoyo, 2001, 2004; Ogada, 2012). Dye et al. (2008) affirm that there is also shortage of qualified teachers of deaf and of research-based teaching methods and instructional materials for HI.

Table 2: Pre-test Data Analysis

Group	Mean	Standard deviation
Control	48.07	8.6
Experimental	43.6	8.0

Data in table 3 indicates variability in the mean obtained by different groups. The difference in means may or may have not been caused by chance. To ascertain, an independent sample t-test was carried out at a significant level of 0.05α. The following were the results of inferential statistics.

Table 3: t-test of Pre-test Means between Experimental and Control Group

Variable	Df	Sig. (2 tailed)	Mean difference	Std err difference	95% interval of the diff	
					Lower	Upper
Pre-test	34	0.130	4.45	2.86	-1.372	10.268

The study carried out the t-test on the means of experimental and control to find out whether the means are significantly different. since the data did not provide sufficient evidence for rejection. It was therefore concluded that there is no significant difference between students in these schools. Meaning the entry behavior of the groups is similar and therefore giving the two samples (C & E group) homogeneity status. During form one selection, students are selected randomly so long as the student has attained 150 marks and above which is the KCPE pass mark for the HI students. All the HI secondary schools are national schools hence the entry behavior is the same. Disparity in achievement heavily relies on other factors such as environment, facilities, administration and pedagogy. The finding is in line with Means (2010); Shapely et al. (2010), when students are engaged in technology-immersed classrooms, there is a gain in achievement in all subject areas.

Table 4a: Pre-test between Control Boys and Girls

Gender	N	Mean	Sd	Df	t-value	p-value
Male	12	46.58	9.6	34	0.73	0.942
Female	3	54	2.65			

P > 0.05, Not Significant

On comparing the means of control boys and girls, the statistic output in table 4a reveals that means score of girls (M = 54; SD = 2.65) and boys (M = 46.58; SD = 9.6); t (34) = 0.73, p> 0.05. The p-value of 0.942 is greater than the testing point of 0.05. This indicates that the pre-test means of the boys is not significantly different from pre-test means of the girls. It is evidenced that the mean achievement of the control group due to gender was not significantly different at 0.05 levels. The null hypothesis was accepted since the data did not provide enough evidence for rejection. Hence it was concluded that there is no significant difference between pre-test achievement of girls and

boys students who were taught through conventional method of teaching. Meaning the entry behavior of the groups may be similar for having same means. Girls are competent just like boys and disparity in performance is affected by other factors. The finding is supported by Abubakar&Oguguo (2011) in their comparison, found no significant difference between performance of girls and boys. This agrees with Uduosoro (2011) who found no significant difference between performance of boys and girls. DFE (2007, p. 3) affirms that factors such as ethnicity and social class have a greater bearing on educational achievement than gender considered on its own. But a high standard deviation of 9.6 by boys clearly show that they achieved more than girls in terms of average as shown in table 4.7b thus they had better grades Agbuga& Xiang (2008) report that boys recorded high performance than girls in Geography. The result is similar to that of Kubiatko et al. (2012), the influence of gender was significant and the boys achieved statistically significant high scores.

Table 4b: Pre-test between Experimental Boys and Girls

Gender	N	Mean	Sd	Df	t-test	p-value
Male	14	44.64	7.4	35	4.4	0.000
Female	7	41.57	9.3			

P< 0.05, Significant

Table 4b reveals that significant difference exists between pre-test means score of girls (M= 41.57; SD= 9.3) and boys (M= 44.64; SD =7.4); t (35) =4.4, p< 0.05. The p-value 0.000 is less than the testing point of 0.05α. Therefore the result indicates that difference exists between experimental girls and boys. Boys before instruction are more competent than girls in Geography achievement. This could be attributed to perceived differences in the learning styles of boys and girls. This is one of the most frequently expressed explanations for the gender difference in achievement. Boys learn by doing things such as experiments or activities and girls would learn well visually by seeing. The finding is supported by Husain & Millet (2009), who report that test scores differs substantially by gender, significantly more boys than girls score very high ranges in Geography thus gender disparity is significant. However this result is contradicted by Zember&Blume (2011) who report that most studies show that girls perform better than boys in schools. Warrinto&Younger (2007) reaffirm this reporting that girls outperform boys.

Posttest Analysis of Data

After a period of four weeks of learning Geomorphology, a posttest was administered to all the groups. This time the means were relatively high as compared to pretest. Experimental had a mean of 53 and control 47.1 as table 5 indicates. This could be attributed to the teaching instruction that had been used. Research has demonstrated that different teaching methods produce different results therefore the identification of the best teaching strategy must be done if the best results must be achieved (Houston &Parigoe, 2010). The outcome from previous research indicated that teaching with learning style adaptation increased students' performance and boosts their motivation to learn (Avile&Moren, 2010).

Table 5: Posttest Means at Group Level

Group	N	Mean	SD
Experimental	38	53	9
Control	41	47.1	8.5

It is evidenced from table 5 that students who were taught by use of hypermedia achieved statistical significantly higher scores in the GAT compared to those taught through regular teaching method. Table 5 reveals the results of different groups that sat for the posttest. Experimental group had a mean of 53 and control 47.1. This descriptive analysis shows a probability of experimental group being superior in achievement. However this can only be confirmed by an inferential statistic that will be carried out at a later stage.

Table 6: Posttest Means and Standard Deviation at School Level

School	Posttest	SD
Experimental (pre-test)	54.71	8.5
Experimental	53.20	9.3
Control (pre-test)	47.07	8.6
Control	47.13	8.7

The results as per schools are shown in the table 6 as follows; experimental pre-test had a mean of 54.71, experimental posttest only recorded a mean of 53.20. The difference in achievement of the two groups should be explained as influence of pre-testing. Pre-test may have influenced achievements. In control group, control pre-test had a mean of 47.07 and control posttest only recorded a mean of 47.13. This is contrary to experimental groups. The group that was not pre-tested is above the group that was exposed to both tests. This shows that pre-test did not have influence on posttest. It can be hypothesized that experimental are competent than control. The competence of experimental is attributed to hypermedia treatment they received. However this is subject to confirmation after inferential statistic is carried out on the data as illustrated in table 7.

Table 7: t-test of Posttest and Pretest Difference

Variables	Df	Sig. (2 tailed)	Mean difference	Std err difference	95% confidence interval difference	
					Lower	Upper
Pre-test / posttest	35	0.000	6.056	1.377	3.261	8.850

An independent sample t-test was carried out for the purpose of inferring from the data and testing of the hypothesis, pre-test had no influence in the study as table 7 reveals. The t-test p- value was 0.000 as table 7 indicates. The t-test p-value is lower as compared to the set alpha of 0.05. This shows that there is statistically significant difference in the pre-test and posttest. The findings that high achievement was recorded on the posttest GAT could be due to some groups being given treatment. Mayer (2005) asserts that hypermedia is more effective for learners with low aptitude and it helps them to connect the new knowledge with the prior knowledge. Further finding indicates that support with careful planning, experience in teaching in a virtual environment can promote achievement in learning (ICM, 2012).

Table 8: t-test of Posttest Means between Control and Experimental Groups

| Variables | df | Sig. | Mean | Std err | 95% confidence interval |

		(2 tailed)	Difference	Difference	difference	
					Lower	Upper
Posttest	77	0.001	6.870	1.952	10.157	2.983

The study sought to test difference in means of control and experimental group. The significance was to establish the effectiveness of hypermedia as opposed to conventional methods of teaching. The t-test p-value is 0.001 less than alpha 0.05. This reveals that there is a statistically significant difference in the posttest means of experimental group and control group. The difference is in favour of experimental group that was exposed to hypermedia. The finding that the mean of experimental is high leads to conclusion that hypermedia is effective in improving achievement in learning Geomorphology in Geography by HI learners. This is because hypermedia enhances ranges of sensory stimuli in instructional circle, hearing, seeing and doing play important role in achievement. Moreover opportunities to learn from classmates are often lessened due to communication. Several research have supported this finding for example the findings of earlier studies, deaf students often perceive that they receive a distorted message when a non-signing teacher's lecture is translated by the interpreter (Vignare et al., 2007). Nearly 40 hypermedia studies found that compared to traditional lecture, learning improvement were higher for the groups that used hypermedia. This was further supported by meta-analysis by various researchers who examined over 200 studies that compared learning presented in traditional way to the same information presented via hypermedia instruction and found that learning was higher through hypermedia than traditional (Long et al., 2011).
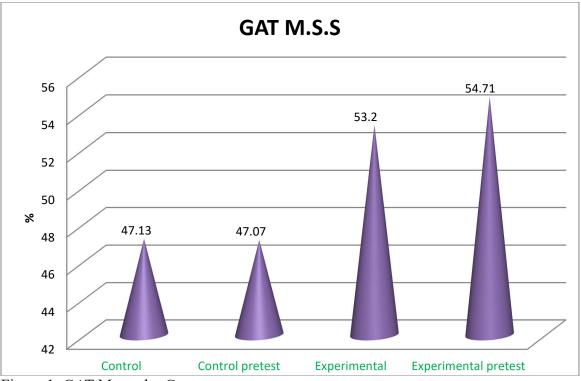

Figure 1: GAT Means by Groups

Control underperformed because HI students have difficulties in visualizing the concept of landform processing. These learners are lip readers hence require intense concentration and this is tiring over long time, this could have led to poor performance. Adoyo (2004) indicated that poor performance of HI is attributed to inappropriate teaching techniques. Teachers are not presenting the curriculum material in a logical form that is accessible to deaf students. They struggle to provide them instruction after class learning support (Liu & Hong, 2007). Zhang & Zhou (2006) further assert, the traditional mode of teaching is sign method, which has been criticized for being tiring, boring, authoritative and emphasis on memorization. Slobodzian (2009) affirms that extra learning resources may not be accessible in class and there is a widespread lack of accessible interactive materials (Parton, 2006).

Table 9: t-test Posttest Means between Experimental Girls and Boys

Variables	Df	Sig. (2 tailed)	Mean Difference	Std err Difference	95% confidence interval difference	
					Lower	Upper
Posttest	77	0.756	0.712	2.284	-3.836	5.259

Table 9 reveals that no significant different exists between posttest Geography means score of girls and boys. An independence sample t-test for the group gave a p-value of 0.756. The p-value is greater than the set alpha 0.05. This means that there is no difference in the posttest in Geomorphology using hypermedia technique due to gender. The null hypothesis is therefore retained since the data did not produce sufficient evidence for rejection. This result implies that gender does not have any significant effect on performance means score of students exposed to hypermedia technique. Thus students perform independent of gender when taught using hypermedia. It also suggests that teachers should integrate hypermedia to teach students in order to reduce any gender difference in students' achievement in Geography. The finding of gender difference is in line with that of (Esiobu, 2011), gender is no longer a significant impediment for performance. However Zamfirov&Saera (2013) contradict, they found that girls and boys learn differently by considering difference in achievement. Further, in teaching Geography, Gender Geography (2010) research suggests that a strong masculine bias exists in the map reading. However Guis et al. (2008) had different opinion in their finding, they found that there is gaps in test score in all subjects.

Before a conclusion was drawn that hypermedia is a treatment that has enabled girls to be as competent as boys, it is necessary to test if the girls in control have performed as well as boys. The study tested the significance in mean difference between control girls and control boys using an independent sample t-test.

Table 10: t-test Posttest Means between Control Girls and Control Boys

Variables	Df	Sig. (2tailed)	Mean Difference	Std err Difference	95% confidence interval difference	
					Lower	Upper
Posttest	77	0.002	0.521	0.130	0.289	0.452

The t-test value was 0.002 as indicated in Table 10. The p-value is less than the alpha which was set at 0.05α. On the analysis it is found that the difference in means of control boys and control girls is statistically in favour of boys. Boys in control have outperformed the girls. This just confirms that it is hypermedia that created conducive environment that led to girls in experimental group to perform as well as boys. Warning, 2006; Younger (2007) affirm that in northern Nigeria, it is believed that subjects like physics, drawing, Geography and the like are for boys and not for girls. This finding is supported by Abigail (2007) assert that there are biological differences in brain development this determines the difference in thinking process between boys and girls. Therefore adapted hypermedia is an alternative to traditional approach to HI learners. It adopts information towards individual preference and improves the experience of the learner who interacts directly with the system. However Warrinto&Younger (2007) contradict the previous finding report that girls outperform boys at school at least in terms of certain key academic hence there is need to refocus equal opportunities to redress the balance for boys. Therefore Alias (2010) reaffirms that it is important to identify the most effective strategies in the content delivery process to achieve objectives.

Role of the Students During Hypermedia Presentation
Teachers were asked to state the role of the students during hypermedia presentation. The finding in table 11 indicates that 70% of the students were active. Hypermedia is an interactive learning media. New technology has drastically changed students' role from traditional instruction to virtual learning. Hypermedia is shifting the emphasis from teaching to learning. An active student will have more responsibilities of their own learning as they can share their knowledge with others.

Employing active learning strategies serves two fold purpose; they make a dynamic classroom ever changing environment in which students have a voice and allowed them to view teachers as people who are flexible enough to take risks in the classroom instruction. It also encouraged students to stay interested and learn more from class when teachers used many medium in single application. Hypermedia provides powerful tools to support the shift from teacher centered to learner centered paradigm and new roles of teacher-learner and new media. It is believe that the most important characteristic of hypermedia is its ability to encourage students to be proactive learners (Drayton et al., 2010).

Changes in Learners

From	To
Passive learner	Active learner
Reproducer of knowledge	Producer of knowledge
Solitary learner	Collaborative learner
Solely learning content	learning to learn, think, create and communicate

However 30% teachers agreed that learning with hypermedia is a passive way of learning. As stated earlier in literature, hypermedia is in three categories that is linear, network organization and hierarchical organization. These teachers could have used linear model which is a passive way of presenting information. In this model both the learners and teachers have very little to do. It is also likely that there are some teachers who have not had experience with hypermedia therefore they are not sure whether hypermedia can encourage passive or active learning. Sivapalan&Crega

(2005) concurs that the main challenge is how to enhance students' participation during presentation. Classroom experience has demonstrated that students who contribute to Geography discussion tend to succeed academically, thus there is relationship between classroom participation and student achievement.

Extent to which Hypermedia Change Teaching Method

Table 11 reveals that 50% of teachers agreed that use of hypermedia greatly changes their teaching method. Hypermedia application involves use of several medium at ago. This relieves the teacher from carrying into class more medium. Hypermedia has potential to transform achievement of the HI through instructional technique.

Changes in Learners

From	To
Single sense stimulation	Multi-sensory stimulation
Single media application	Multimedia application
Delivery of information	Exchange of information
Monologue communication	Dialogue & collaboration
Analogue resource	Digital resource

All these changes in pedagogy demand a new learning environment to effectively harness the power of hypermedia (Zhu, 2003; Kim & Gilman, 2008).

Table 11: Teachers' Opinion on Application of Hypermedia

Opinions		Frequency	Percent
Most effective technique	Illustration	3	30
Employed	Hypermedia	2	20
	Power point	5	50
TOTAL		10	100
Role of students during	Passive	3	30
Presentation	Active	7	70
TOTAL		10	100
Extent to which hypermedia	Not at all	2	20
Change teaching method	Much	5	50
	Very much	3	30
TOTAL		10	100

From table 13 it reveals that use of hypermedia leads with 70% teachers accepting that hypermedia achieves equitable learning outcome. This is because hypermedia offers multiple learning styles and therefore each learner could meet his/her learning preference through the use of multimedia which employs the four senses. Students would benefit from the way in which the textbook contents are demonstrated. The use of technology in learning has helped them largely. This

motivates their self- learning abilities by pursuing audio-video supported illustrations, texts, graphics and drawings. Chowdhuri et al. (2012) agree that deaf students cannot be exempted from e-learning approach.

None of the teachers agreed that CDROM and hyper-studio can achieve a positive outcome. CDROM is non-visual media thus audio aid therefore many learners are not able to benefit from the lessons in which it is used because majority of the learners in this study have conductive deafness. Berndsen&Luckner (2010) state that use of CD-ROM in the classroom is still pedestrian. Teachers were not familiar with variety of teaching strategies that can be used with CD-ROMs in order to increase its effectiveness. This is most likely a consequence of lack of available resources.

However CD-ROMs help to standardize the sign for particular concepts. This helps in avoiding to use interpreters who may lack sign for technical terms. This is one of the problems in teaching Geomorphology. Cooshna&Teelock (2006) report that the problem with teaching and learning Geography are terminology, symbols and interpretation of language. In this way technology has become a way of extending and developing good practice and providing permanent visual record. None use of hyper-studio was also noticed, this is a rare technique used in teaching the HI. Hence it is one of the most appropriate media because it can pull a variety of resources together, for example the teacher can have scrolling text for subtitles and video clips for signing, together with still pictures, text and sound. It seems teachers have no idea for this technology and that is why it was not regarded as one of the medium which can provide a positive outcome.

From the results in table 12, most of teachers (80%) agreed that hypermedia can extend learning. Students are able to self-adjust the time and determine the information based on preference since hypermedia provides different alternatives that individual learner can benefit from. Students can use hypermedia on their own time, place and speed to learn the concepts. Ma, O'Toole & Keppel (2008) support the finding reporting that based on individual differences students self-adjust the time and determine alternatives in learning.

However few (30%) teachers agreed that hypermedia cannot extend students' learning. This could be attributed to teachers who did not have experience with hypermedia. Hypermedia is one of the recent technologies which have just been introduced in the classroom instruction. These teachers find it difficult to incorporate hypermedia hence believe it cannot extend learning. The finding is supported by several researchers. Mishra & Sharma, 2004; Mantin&Kleion (2008) who assert that, it is challenging to produce and incorporate multimedia enable learning methods into existing practice without creating unnecessary frustration in the learning process.

Table 12: Media which Achieves Positive Outcome

Variables		Frequency	Percent (%
Achieves equitable learning outcome	Hypermedia	7	70
	CD-ROM	0	0
	Sign it	3	30
	Hyper- studio	0	0
TOTAL		10	100

Hypermedia extends learning	Yes	7	70
	No	3	30
TOTAL		10	100

N = 10

A further inquiry by an open-ended question was made by asking the reason why the media could extend students learning. Those who said that hypermedia can extend learning beyond classroom gave the following reasons; *TE[1], it improves understanding because students could see the process of various landforms for example formation of headlands and bays, TE[2], it can be used anytime anywhere and facilitates creativity.*

The results further revealed that hypermedia is the best because students can access information on their own through navigation. This motivates them hence learn better therefore teachers should always keep learning at the center of learners. Technology is the central focus and heart of all activities and pedagogy in classroom instruction. National Teacher Institute (2006) concludes that I hear I forget, I see I remember, I do I understand.

CONCLUSIONS AND RECOMMENDATIONS

National laws and policies should integrate accessible information, communication and technologies to ensure that their implementation enables persons with disabilities access them.

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