Effects of Animations on Students' Achievement in Kiswahili Reading Comprehension in Public Secondary Schools in Njoro Sub -County, Kenya

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Abstract

The study aimed at investigating the effects of using animations in teaching Kiswahili reading comprehension on students achievement among secondary school students' in Njoro Sub- County Kenya. Solomon Four Non-Equivalent control group design was used in the study. Target Population comprised all 14,292 students in the public co-educational secondary schools in Njoro Sub County. The accessible population included the 4,745 Form Two students from public co-educational secondary schools in the Sub-county. Purposive sampling technique was used to select one form two class from each of the four co-educational secondary schools which provided the sample size for the study 160 students. The four schools were randomly assigned to experimental and control groups. For the experimental group, animations were used during the lessons while conventional methods were used for the control groups. Data was collected using Kiswahili Reading comprehension achievement test, whose reliability coefficient of 0.76 was attained using Kuder -Richardson 20 (KR-20). The null hypothesis was tested at 0.05 level of significance. Data was analysed using t-test, ANOVA and ANCOVA. Before the treatment, a pre-test was administered then after four weeks a post-test. The findings proved that after the treatment, the students in the experimental groups attained higher scores compared to the ones in the control groups. This signifies that the use of animations in teaching had an effect on students' achievement in Kiswahili reading comprehension. Therefore, teachers are encouraged to incorporate the use of animations in teaching Kiswahili reading comprehension in attempt to improve achievement in Kiswahili subject.

Key words: Animation, Achievement, Kiswahili

INTRODUCTION

Language is very essential to all forms of communication between persons. It is an important cultural tool since it is the main channel through which sharing and exchange of values, attitudes and aspirations occur (Chepkemoi & Wanyonyi, 2017). Kiswahili is an African language of bantu origin which is spoken by various ethnic groups. Globally, Kiswahili is among the most influential and widely studied indigenous language of Africa by over 150 million people (Tibategeza & Du Plessis, 2018). In the Kenyan context, Kiswahili is a compulsory subject that is examined at both primary and secondary school levels. It is also offered as one of the languages in all the Kenyan teacher training colleges and public universities, hence it is a career subject. Additionally, there are broadcasting stations that broadcast in Kiswahili and even newspapers written in Kiswahili. With this, the use of Kiswahili, therefore, takes cognizance of its role in nation-building (Jerotich, 2015). Despite of its importance in nation building, a decline in academic achievement among secondary schools' students in the subject has been reported in Kenya. This is contrary to the objectives of Kiswahili syllabus that expect learners to listen, understand, express themselves logically and clearly in speech and in writing. They are also supposed to read, comprehend correctly and communicate appropriately (KICD, 2017).

Researchers have associated the poor performance in the subject to various factors. among them, poor teaching methods, lack of appropriate resources, facilities and motivation.(Turuthi et al., 2017). The use of teacher-centered approaches in classrooms is said to be among the main contributors to poor performance. This is because, in using these methods, the teacher dominates the entire lesson not allowing the students to discover knowledge on their own. In the long run, students remain passive during the lesson (Ngozi, 2021). On the other hand (Murunga, 2018) affirms that the use of learner centered methods in teaching of language encourages active participation of all the learners making the teaching learning process enjoyable. Therefore, teaching Kiswahili reading comprehension should be modified to be learner centered in order to improve the performance of learners. The performance of students in reading comprehension among other aspects, continued to be below average making it an issue of concern for the future of the language in Kenya (KNEC, 2017). (Ouda, 2012) describes reading

comprehension as the ability to understand a written passage of text. Without comprehension skills, students cannot contextualize what they have read. Comprehension is what leads to the success of any reading text, whether it is reading for entertainment or for research purpose. Without comprehension skills, it's difficult for students to grow academically since reading is the foundation to all academic subjects such as humanities, languages and sciences (Al-Jarrah & Ismail, 2018).

Globally integration of technology in education is recognized as one of the appropriate strategies for transforming the education quality, by converting the classroom environment from teacher-centered to learner-centered. This is because the use of technology provides variety of activities that effectively involve the students' compared to the use of chalk and talk (Ploetzner et al., 2021).Animations as a form of technology, may be of benefit in the teaching and learning of Kiswahili reading comprehension. This is because it provides a wide range of tools that can be used in the classroom environment. Additionally, it has components that aid the learning of abstract subject matter (Bamidele & Yoade, 2017) Animations are increasingly being used in developed countries with most making their use compulsory during teaching. It is a teaching approach that encourages the use of both the cognitive and affective dimensions of the teaching and learning process (Ngozi, 2021). Hence, bringing real life perspectives to the classroom environment. For instance, if the comprehension is about how industries cause water pollution, the teacher and the students may not be able to visit the industries and see how they cause water pollution, but the teacher can have animations of the industries showing how they cause water pollution.

Achievement is the outcome of instruction. Good achievements are often an indication of meaningful learning (Ngozi, 2021). Hamzat et al., (2017) confirmed that the use of animations in teaching improved students' achievement compared to conventional teaching methods. This was related to the fact that the use of animations in teaching uses both audio and visual styles which attracts the attention of the learners making them to concentrate during the entire lesson. conventional method of teaching where teachers are at the centre of the classroom activities. They talk, teach and explain throughout the lesson. They also noted that, in conventional classrooms, learners have fixed perception of their teachers' role and their own roles. Additionally, students' participation in teacher centered learning is at a minimum, since the method is totally teacher controlled and students are allowed to participate only when teachers deem it necessary. Teacher-centered approaches include: lectures, demonstrations, chalk and talk method. Therefore, there is need to explore the use of learner centred methods which involve active participation of learners in order to enhance their performance.

Purpose of the study
The purpose of this study was to investigate effects of animations on students' achievement in Kiswahili reading comprehension in public secondary schools in Njoro sub -county, Kenya.

Hypotheses
The following hypotheses was tested for the study; There is no statistically significant difference in students' achievement in Kiswahili reading comprehension between students taught using animations and those taught using conventional methods.

METHODOLOGY
This study was a quasi-experimental research in which Solomon Four Non-Equivalent Control Group design was used. The quasi-experimental approach was used because secondary school classes once constituted exist as intact groups and school authorities do not allow the classes to be broken for research purposes. The design has an advantage over others because it has the best controls over the threats to internal validity (Fraenkel, Wallen, & Hyun, 2006). The study involved four groups. Group I, the experimental group, received the pre-test, the treatment (X) and the post-test. Group II control group, received a pre-test followed by a control condition and then the post-test. Group III the experimental group did not receive the pre-test but received the treatment (X) and post-test. Group IV control group received the post-test only.

Target population comprised students in the public co-educational secondary schools in Njoro Sub-County. It was approximately 14,292 students. Accessible population was Form Two students from the public co-educational secondary schools who were approximately 4,745 students. The sampling unit was secondary schools and not individual learners since students operate as intact groups. The sampling frame was a list of sub-county secondary schools in Njoro Sub-County. The technique used to select the four co-educational schools that formed the sample of the study was purposive sampling technique. This is because the researcher intended to have schools with working computers, projectors and electricity. Additionally, trained teachers with a teaching experience of minimum two years were used for the study. Purposive sampling was also used to select schools with similar characteristics that are a distance from each other so that the students from the experimental and the control groups do not interact during the study period hence causing contamination in the results. The four schools were randomly assigned to the treatment and control groups. For schools that had more than one Form Two streams, all the streams were taught using a similar method of teaching and then simple random sampling was used to pick one stream for

the study. The sample size for the study was 160 students, with each group having 40 students. This provided a reasonable sample size since it is recommended that at least 30 individuals per group are required for experimental research

Kiswahili Reading Comprehension Achievement Test (KRCAT) was used to collect data. The test was given before and after the treatment so as to establish the comparison between the pre-test and the post-test results. The instrument was presented to specialists from the Department of Curriculum, Instruction and Educational Management Egerton University to check for content and face validity. The reliability of KRCAT was estimated using Kuder Richardson 20. The test was administered to students in a different school from the ones selected for the study. The scores obtained were used to estimate the reliability of the instrument which yielded a reliability coefficient of 0.76.

The study involved four groups. The four groups were grouped into two. Experimental group denoted E1 and E2 and the control group denoted C1 and C2. The researcher developed the teaching guide and lesson notes for the experimental groups. The teachers from the experimental group were trained on how to use the guide for a period of 1 week. In the experimental groups the teacher guided the students in watching the animation with the aim of understanding some concepts in the comprehension. Afterwards they used what they watched to answer questions.

RESULT

To determine the effect of animations on students' achievement in Kiswahili reading comprehension, students in the experimental and control groups were taught the same topic then afterwards given a similar post-test. Before the teaching of the groups, the researcher made sure that the groups had similar characteristics by doing a pre-test. The results are as presented in Table 1

Table 1 pre-test scores

Schools in the study	n	Mean	Std. Deviation
Experimental 1	40	5.9000	1.48151
Control 1	40	5.9500	1.46672
Total	80	5.9250	1.46499

From Table 1, mean values for pre-test scores were 5.90 and 5.95 for Experimental group 1 and Control group1respectively. According to these results, the mean score for Control group 1 was higher compared to Experimental group 1. However, to test whether the means were statistically significantly different, a statistical procedure was carried out using an independent sample t-test and the results are as presented in Table 2.

Table 2: Independent Samples t-Test on Pre-test Scores CAT 1

		Levene's Test for Equality of Variance				
		f	Sig	t	Df	Sig. (2tailed
Pretest scores	Equal variances assumed	.075	.785	.152	78	.880
	Equal variances not assumed			.152	77.992	.880

Basing on Table 2, the results indicate that there was no statistically significant difference in the two means t (78) = .152, p > 0.05 of Control and Experimental groups. This implies that the levels of achievement prior to administration of the intervention for the two groups were similar. That is, the groups were equivalent before administration of treatment and therefore appropriate for use in the study. The means of post-test scores for the four groups involved in the study are presented in Table 3. This was mainly to find out if there were differences in the mean scores.

Table 3. Summary of Mean Scores on Post-test

Groups	n	Mean	Std. Deviation
Experimental1	40	9.4000	1.66102
Control 1	40	7.5750	1.99856
Experimental 2	40	10.0250	2.52665
Control 2	40	5.4500	2.18327
Total	**160**	**8.1125**	**2.75404**

From Table 3, the highest mean score was attained by Experimental Group 2, followed by Experimental Group 1, then Control Group 1 and lowest was Control group 2. The students in Experimental groups1 and Experimental 2 were exposed to animation use in teaching and their mean score was higher than those in the Control 1 and Control 2. This suggests that animations enhanced student's achievement. However, the results on Table 3 do not reveal if the groups were statistically significantly different. To establish this, one-way Analysis of Variance (ANOVA) was carried out as shown in Table 4.

Table 4: One-way ANOVA of Post Test Scores

Scale	Sum of Squares	Df	Mean Square	f	Sig.
Between Groups	507.725	3	169.242	37.811	.000*
Within Groups	698.250	156	4.476		
Total	1205.975	159			

The difference in the post test scores were statistically significant at 0.05 in favour of the experimental groups, $F_{(3,156)} = 37.811$, $p < 0.05$. The results however did not indicate where the differences occurred. To find out where the difference existed, there was need for a Post-Hoc analysis to show this. The results of this analysis are presented in Table 5.

Table 5: Scheffé Comparisons of the Post- Test means for the four groups

(I)category of school	Category of school J	Mean Difference (I-J)	Sig
Experimental 1	Control 1	1.82500	.003*
	Experimental 2	-.62500	.628
	Control 2	3.95000	.000*
Control 1	Experimental 1	-1.82500	.003*
	Experimental 2	-2.45000	.000*
	Control 2	2.12500	.000*
Experimental 2	Experimental 1	.62500	.628
	Control 1	2.45000	.000*
	Control 2	4.57500	.000*
Control 2	Experimental 1	-3.95000	.000*
	Control 1	-2.12500	.000*
	Experimental 2	-4.57500	.000*

Table 5 shows the results of Scheffé Post-Hoc comparisons of post-test mean scores. A statistically significant difference between the pairs of post-test means for groups E1 and C1, E1 and C2, C1 and E2 and E2 and C2 respectively was noted. Therefore, this proved that use of animations in teaching enhanced students' achievement in the experimental groups compared to those in control groups. This study involved non-equivalent control group design and since entry behaviour may affect performance it was necessary to run Analysis of Covariance (ANCOVA) using the students' Kenya Certificate of Primary Education (KCPE) total mark as covariate. It was also necessary to check whether their KCPE scores correlated closely with the scores obtained from this study. The results on this analysis were as indicated in Table 6.

Table 6: ANCOVA of the Post-test Scores with KCPE Total Mark as covariate

Source	Type III Sum of Squares	df	Mean Square	f	Sig.
Corrected Model	520.142[a]	4	130.035	29.388	.000*
Intercept	557.519	1	557.519	126.001	.000*
KCPESCORE	12.417	1	12.417	2.806	.096
Schools	519.781	3	173.260	39.157	.000*
Error	685.833	155	4.425		
Total	11736.000	160			
Corrected Total	1205.975	159			

Table 6 shows the results of ANCOVA of the post-test score with the KCPE total marks as the Covariate. However, the results on this Table reveals that the differences between the groups was statistically significant $f_{(3,155)} = 39.157$, $p < 0.05$). Scheffé Post-Hoc analysis was carried out to establish where the difference occurred among the groups. The results are presented in Table 7.

Table7: Scheffé Post-Hoc analysis

(I)Name of school	(J)Name of school	Mean Difference(I-J)	Sig
Experimental 1	Control 1	1.933	.000*
	Experimental 2	-.652	.168
	Control 2	4.046	.000*
Control 1	Experimental 1	-1.933	.000*
	Experimental 2	-2.585	.000*
	Control 2	2.113	.000*
Experimental 2	Experimental 1	.652	.168
	Control 1	2.585	.000*
	Control 2	4.698	.000*
Control 2	Experimental 1	-4.046	.000*
	Control 1	-2.113	.000*
	Experimental 2	-4.698	.000*

From the results, the mean differences among the following groups E1 and C1, E1 and C2, E2 and C, E2 and C2 were statistically significant. This would, therefore, suggest that animations enhanced students' achievement in the experimental groups compared to those in control groups who were taught using conventional methods. This implies that animations have a positive effect on achievement in Kiswahili reading comprehension.

DISCUSSION

This study proved that students taught through animations attained scores that were statistically significantly higher compared to those taught using conventional methods. This implies that use of animations in teaching was more effective in enhancing students' achievement. The findings of this study build on the existing knowledge of an earlier study by Osuafor, Maureen and Anusiuba (2019) who found that use of animated media in instruction was more effective in enhancing student achievement than conventional methods. Additionally, they found that the use of animated media provided the students with a richer learning experience than they would have had when taught using conventional methods. There was greater level of interaction with such learning materials which gave the learners' more responsibility towards their learning.

Bengkulu (2016) argued that students taught through animations attained higher scores in reading comprehension than those taught through conventional method since by watching the animations, they could see facial expressions, postures, gestures and details of the comprehension. Bengkulu (2016) observed that the students would be willing to watch, even if their comprehension skills were inadequate. This means that, learners would still have interest in watching the animations despite the fact that they got difficulties in understanding the text. Therefore, by using animations in teaching reading comprehension, the students could easily get the idea by synthesizing what they read and connecting with what they see, which improves their achievement.

Numgwo, Emmanuel and Joseph (2017) conducted a study to investigate the effects of animations on students' achievement and retention in Basic Electricity. The results were similar with those of this study which proved that animation use in teaching was more effective in enhancing students' achievement compared to conventional methods. Therefore, the finding on poor performance in reading comprehension noted to exist among students in recent times could be attributed to the use of traditional teaching methods (Francis (2017). However as revealed by this study, this poor performance in reading comprehension can be reduced by employing animation teaching strategy.

The results of this study proved that students taught though animations performed better than those taught through conventional methods. The statistically significant difference could be as a result of the ability of the animations to provide both visual and audio representations of the comprehension. Additionally, animation have the potential of making students learn better because it is fun. Fun is a natural way through which students enjoy and actively participate in the lesson, therefore, improving their performance (Ikwuka & Samuel, 2017).

CONCLUSION

According to the results obtained from the study, it can be concluded that animations use in teaching improves students' performance compared to the conventional methods of teaching.

RECOMMENDATION

Education stakeholders should encourage language teachers to use animations in the teaching of comprehension particularly at secondary level since it can address the poor performance in the subject.

Teacher education curriculum developers should include the teaching of languages using animations as part of the teacher education syllabus during the training of the language teachers.

The ministry of education and other professional bodies should organize workshops for teachers to train them on how to develop short and easy animations that they can use in their daily teaching without only relying on the

ones provided by the government.

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