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EFFECT OF TEACHING ON ZOOM VIRTUAL ON SECONDARY SCHOOL STUDENTS' PERFORMANCE IN HISTORY AND GOVERNMENT DURING COVID-19.

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ABSTRACT

There was wide consumption of the Zoom platform for teaching both at secondary schools and higher institutions of learning in Kenya during the covid season. This study evaluated the effect of teaching through the virtual zoom platform on the performance of public secondary school students in history and government subject in Naivasha, Kenya. The study's specific objectives were to: Establish the difference in academic performance between learners taught through Zoom Virtual Learning platform and those taught face-to-face and to assess if such difference in performance depended on gender. The study followed the nonequivalent Quasi experimental design, with a sample of 256 Form 2 classes in four schools. 117 students formed the treatment group while the other group of 139 formed the control. In 2021 when students were allowed to return to school in January, with mask mandate the experimental group was taught for three weeks through zoom while the control group was taught face to face. The results returned mixed results with boys decreasing while girls got higher mean score in the posttest . The study also found a significant difference in academic achievement in History and government by gender between students taught through the Zoom Virtual Learning platform and those taught in face-to-face classes in favour of girls. Based on the findings, the study concludes that teaching through a virtual platform requires more care to know the most salient characteristics which create successful results. More research is needed to delineate the factors that ensure effectiveness of virtual platforms for users and its implications for diversity in the classroom. Similar studies should be conducted to test these findings in other locations, contexts, and disciplines to overcome some of the limitations of this study.

Keywords: Academic performance, Covid-19, History and government, Gender, Virtual learning platform, Zoom.

INTRODUCTION

In 2020, the covid-19 pandemic left schools and institutions in Kenya closed; schools were closed to control the spreading of the pandemic to Kenyan citizens. A study by the Usawa Agenda (2020) on equitable access to education indicated that only 22% of students interviewed in 2020 from forty-two counties were accessing online learning resources, with the larger number being from private schools compared to their counterparts in public schools. On the other hand, Waitindi (2020) explained that the Association of Volunteers in International Services (AVSI) based in Dadaab, trained teachers on how to use the zoom application so that learning could continue. The organization used zoom to create awareness of the spread of covid-19 in the Dadaab refugee camp.

The technology most used for remote teaching and learning was video teleconferencing, majorly teaching through Zoom virtual learning platform. According to Google App Statistics (zone), Zoom was rated at 4.6 out of 5, a four-star by 2,328,674 users, due to its relevance and ease of use during virtual session customer experience (Chesnutis, 2020). Camilla (2020) of One School Global (OSG) explained that her institution used zoom virtual learning platform for learning and engagement of over 500 students in 20 countries worldwide. Christen (2020) describes zoom as user-friendly, cost-effective, and fit for distance learning learners. According to Bernstein (2021), learner engagement refers to the level of focus, interest, desire to know, optimism, and passion for more knowledge, skills, and new norms. Learner engagement narrows down to the individual learner's participation in learning activities during the teaching process, his reactions towards the teacher, the learning platform, fellow learners, and his/her commitment to attending classes.

Zoom platform has an instant chat zone that allows the teacher to pose tasks to students and request immediate response; on the other side, learners can take advantage of the zone to seek clarification from the teacher, who responds instantly, making learners adequately engaged. According to Chang & Fang (2020), seeking responses and feedback from students before, during, and after a session assists the teacher in addressing learner needs. Being responsive to student feedback encourages students to speak up and continue to offer feedback.

Dhawan (2020) argues that due to COVID-19 and remote learning, society has become more aware of the challenges students face that may have impacted how they attend and behave in class.

The challenges range from deaths of loved ones to economic impact to technology division. It was a moment to acknowledge the inequities that persisted outside of the classroom and create an environment where students would want to show up every day to interact with their teachers and peers (Dutta & Smita, 2020;). Zoom can create such an environment where students are motivated to be productive and speak out (Benson, 2002).

Due to its importance, most nations have made access to basic education affordable and compulsory. United Nations (2020), for example, highlights that in 2020, one and a half billion children and young people could not attend classes physically because of the Covid-19 pandemic. According to Commonwealth (2016) the unavailability of schools, distance to the school, safety, and cultural norms are additional factors limiting access to education. Christopher (2020) observed that many schools turned to virtual technology as an alternative to in-school instruction during the Covid-19 break. Kessler & Linda (2020) explains that businesses and schools coped with the new normal using the zoom virtual learning platform, which they called zoom bombing.

The school of Education, University of Nairobi, began a remote learning program using the zoom virtual learning platform in which Master of education students attended classes via zoom and were able to sit for examinations online.

According to Serham (2020), during the Covid-19 pandemic, the zoom virtual learning platform was the main platform of choice for many universities, colleges, secondary schools, and individuals. It was used to ensure continuity of teaching and learning, providing an engaging environment through a video call, that allowed learners and teachers to interact during teaching/learning process as well as after learning, without contracting the virus through contact. Zoom is described as an online technological tool that provides collaboration and conferencing solutions without physical meetings (Guo, 2020). Teachers were using teleconferencing systems like Zoom and Google Meet to reach students away from school, to conduct one-on-one meetings with students needing remedies, or to organize classes into manageable discussion groups.

History and government subject gives students the skills to understand their past and present. It is a subject with a huge Form 4 candidacy in Kenya. With closure of schools during the covid-19 pandemic there was need to find ways to continue learning at home. Nation media had given the school subject a poor report card in its assessment. (Nation's Report Card, 2018).

Many studies have since been carried out on this field of virtual learning platforms by scholars (Marika et al., 2011; Abuhassna et al. (2022; Hasegawa et al. (2019; Appanna, 2020), but none has brought to the limelight the influence of Zoom Virtual Teaching on Performance in a particular subject.

With emergency challenges in mind and understanding the students' experiences and needs, it may be necessary to apply virtual teaching. Virtual platforms have resources which can be used to ensure that learners are fully engaged in class, keep track of the needs of each student, and address the collective distressing experiences of the COVID-19 pandemic (Farhana et al., 2020). Teleconferencing systems have been shown to have advantages for learners with some disabilities and girls, often increasing their participation rates in learning (Oduor et al. 2019; Mooijman et al., 2005 ; Lederman, 2020) .

According to constructivist theory, a teacher only acts as a facilitator of the learning process and ensures that he/she understands the learner's preexisting conception and guides the learner to build on them (Oliver,2000).

With the wide utilization of Zoom's virtual learning platform in teaching both at secondary and higher institutions of learning, the researchers decided to find out whether teaching through zoom is as effective as face-to-face teaching. This study was done in 2021 in Naivasha when students reopened school from covid-19, with masks. This study is thus purposed to establish the difference in academic performance between learners taught through Zoom Virtual Learning platform and those taught through the face-to-face class.

RESEARCH HYPOTHESES

The study was guided by the two objectives , to investigate if zoom teaching produced better results than face to face (F2F) and if there was significant difference in performance between boys and girls , represented by the two null hypotheses:

H_{01}: There is no significant difference in History and Government mean scores between students taught through the zoom platform and those taught through the conventional face to face.

H_{02}: There is no significant difference in History and Government mean scores between boys and girls students taught through the Zoom Virtual Learning platform.

Methodology. The researchers used the non-equivalent design of a pretest posttest quasi-experiment design.

Participants in the study were subjected to a pretest to a pretest at the beginning of the study, and a posttest at the end. This study was conducted in February and March 2021 when students were recalled to school after a long break.

Four schools with similar characteristics from Naivasha, Kenya were purposely selected due to their preparedness in using remote teaching and learning to complete the syllabus during the covid mask mandate period, and the schools had many similarities. The four schools were all day schools, equipped to teach online with ICT laboratories and a stable internet connectivity. The schools had attempted remote teaching during the Covid-19 break in 2020. Each school had a double stream with about 40 students in each stream from two classes. 256 Form Two students were selected for the study. Of these, 117 formed the treatment group and were subjected to zoom virtual learning. The other group of 139 was used as the control. The researcher employed questionnaires and an achievement test before and after teaching a topic in History: 'Trade". The experimental group registered in advance for participation in the zoom class. Lesson plans were made to teach two one-hour lessons per week on zoom or face to face for 6 weeks.

A sample of 48 students randomly selected from a fifth day school were used in a pilot.

RESULTS AND DISCUSSION

237 students completed the study, 19 dropped out representing a return rate of 92.6%. The following section explains the data that was collected and summarized in presented tables.

Performance of zoom delivery versus Conventional F2F

To find if there existed a difference in academic performance in History and Government subject between learners taught through Zoom Virtual Learning platform and those taught in a face-to-face class, the control and treatment groups were given a pretest whose results are presented in Table 1.

Table 1: T-Test for Pretest

Group	Mean	SD	T	p-value
Experimental Group	68.85	16.18	2.342	0.762
Control Group	66.56	17.06	1.181	

From the Table 1, the experimental group mean score was higher than that of the control group, but this was not significant (p>.05) meaning it was just a possible random difference. The results show that both groups were therefore at par in the beginning, and allowed a fair comparison later in the posttest group means.

The study then sought to find if there existed any significant difference in academic performance between learners taught through the Zoom Virtual Learning platform and those taught using the conventional face-to-face method. The results are presented in Table 2.

Table 2: T-Test for Post Test Between Experimental and Control groups

Group	Mean	SD	T	P-value
Experimental Group	72.07	16.93	39.843	.000
Control Group	62.52	17.76		

The findings show that mean of the experimental group was 72.07, and a standard deviation of 16.93 while the control had a mean of 62.52. The p-value was .000<0.05; therefore, the conclusion is that there was a statistically significant difference in students' academic performance in the experimental group pretest and post-test. The study results showed that the control group had a mean of 62.52 and a standard deviation of 17.76 after the test. The p-value for the control group after the test was 0.631>0.05, implying no significant difference in mean pre and post-test. The hypothesis was evaluated using a < .05 p-value cut off. Based on these results, the p-value was <0.05; therefore, the null hypothesis was rejected, and the alternative hypothesis adopted that there is a significant difference in History and Government mean scores between students taught through zoom and those taught the conventional way. The result implies that adopting the zoom virtual platform effectively achieves learning objectives, especially during pandemics when learners cannot have physical face-to-face learning.

The results also imply a difference in the performance of students taught via the zoom virtual platform and those that were taught through the conventional face to face (F2F). This difference could arise because Chang and Fang (2020) and Benson (2002) that the Zoom platform has an instant chat zone that allows the teacher to pose tasks to students and request immediate feedback; the students, on the other hand, can seek clarification from the teacher, who responds instantly. Seeking feedback from students is a great way to ensure teachers are responding to the learner's needs and being responsive to student feedback encourages students to speak up and continue to offer feedback.

Benson (2002) also revealed that Students agreed there was a link between the ability of an educator to produce a good connection with them and exactly how inspired they remained in that teacher's lesson. Zoom virtual class and how they performed in assessments.

Difference in Performance Between Genders

The second objective of the study was to assess the difference in academic performance by gender between students taught on the Zoom Virtual Learning platform and those using conventional methods. This section presents the pretest results.

Table 3: Group means in Pretest and Posttest.

Group	Pre-test MEAN SD	Post-test MEAN SD	Gain
EB	76.07 8.272	75.88 12.608	-0.19
CB	64.37 11.809	62.82 5.002	-1.55
EG	65.74 16. 413	69.01 19.278	3.27
CG	69.24 17.126	62.20 7.538	-7.04

The results in Table 3 show that the post-test mean score for boys in both the experimental group and control groups were higher than those of girls. The highest mean score was posted by the experimental boys' group while the Control boys' group had the lowest mean, 64.37 in the pretest . Figure 1 graphically summarises the information in Table 3 graphically.

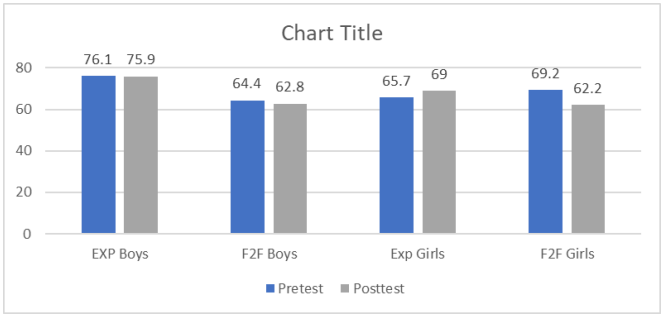

Figure 1: Difference between Pretest and Posttest Means for Groups

Despite relatively high means for various groups, Figure 1 shows that that the posttest mean represented a drop from the pretest for almost all groups. The scores above 60% in History and Government, however, serves to illustrate that efforts to learn in whatever form during an emergency lockdown are beneficial to most students. The emergencies require quick repurposing and use of accessible educational technology creatively to address the situation (Reimers et al., 2020).

From the standard deviations of the posttest mean, girl groups both control and experimental showed more variability than boy groups.

However, one notes that for most groups, the post-test mean scores declined even after having been taught through the conventional method that involves teacher talk and notes, perhaps reminiscent of the tragic Covid-19 period. Adnan and Anwar (2020) concluded that online learning may not produce as neat results in developing countries the need to support teachers and students in their endeavor The Experimental girls group is the only that recorded a gain of 3.27 after being taught through zoom. The covid119 period was an emotionally difficult time for teachers and students, with girls keeping at home, and boys possibly out, busy looking for temporary employment to subsidise their families' reduced incomes (Siewers et al., 2022). Serhan (2020) explains that in the initial periods, students were not completely satisfied with virtual teaching. Notice that the girls who were in F2F learning were most hard hit with reduced mean scores from pretest to posttest with a drop of 7.27.

These results agree with Kebritchi, Lipschuetz and Santiague (2017) who found that distance learning delivered through a virtual system, such as zoom, can result in reduced training course satisfaction, and reduced academic grades when contrasted to F2F learning. The experimental girls group may have had the advantage of having a specified time when they were forced to stop and attend the zoom lesson. With access to the internet boys are likely to also get tempted to involve in uncreative pastimes like playing video games. These results concur with the assertions by Lederman (2020) that students with diversity issues faced the challenge of adapting to face-to-face mode, which led to their poor performance in assessments. Lederman (2020) also explained that teaching through Zoom virtual learning platform enabled such students to enjoy learning this is because it allows limited camera view; in most cases, only the chest and head of the student are visible, and nobody can see what the student does not want to be seen.

From Table 3, only the experimental zoom girls group increased their mean score in the posttest. The increase from the pretest was tested for significance using the t test of the difference of two means. The study sought to assess the difference in academic performance by gender between students taught on the Zoom Virtual Learning platform and those using conventional methods after administering the test.

Table 4: Significance of Posttest Means Between groups.

	Mean	Std. Deviation	T-statistics	Gain	P-value
Experimental Group (Boys)	75.88	12.608	42.257	-0.19	.000
Control Group (Boys)	62.82	5.002			
Experimental Group (Girls)	69.01	19.288	28.027	3.27	.000
Control Group (Girls)	62.20	7.538			

The results in Table 4 show that the mean score of boys in the experimental group was higher than that of all other groups, while the mean score of girls in the experimental group improved to 69.01 in the posttest. In both cases the variability of the experimental groups is higher than that in the control showing that there was greater spread in the test performance of those studying through zoom, perhaps due to engagement issues or pupil truancy (Dixson, 2010).

With the result of the difference between the means of the control and experimental girl groups being significant, it was concluded that in the experiment only the girls benefited from zoom virtual instruction. Lederman (2020) explained that teaching through Zoom virtual learning platform has enabled such like students enjoy learning, this is because it allows limited camera view, in most cases only the chest and head of the student is visible, and nobody can see what the student don't want to be seen.

CONCLUSION AND RECOMMENDATIONS

First, the study concludes that teaching through Zoom virtual platform offers a practical platform for teachers to use in teaching students in History and Government. Even though the boys' mean score decreased from the pretest to the posttest, the scores were comparable to the control group which was taught through F2F. Students were able to get scores that were comparable to the regular classroom. However, the boys taught to through zoom recorded a minor drop in scores, while girls recorded a significant gain.

The design of the study was not adequately robust to explain this contradiction, why boys who were generally performing better overall than girls would have a lower mean score , while that of girls increased. Although we attributed this to boys possible lower disengagement to zoom than girls, other studies are required to focus on the difference between the genders on their response to learning through zoom.

The study also concludes that zoom virtual teaching provided room for teacher-learner interaction, and it ensured consistent check-ins that helped teachers in assessing

students' needs week by week and allowed them (learners) to adapt to the teacher's teaching in a way that created an environment where students are motivated to be productive and speak out. The study further concludes that shifting to digital teaching suddenly was a challenge for both the students and their teachers; however, they adapted quickly to the new situation, especially in the secondary schools in Naivasha demonstrating resilience in the face of hardship. With regards to the academic performance by gender between students taught on the Zoom Virtual Learning platform and those using conventional methods, the study concludes that there is a substantial difference in performance between girls and boys in secondary schools in Naivasha taught on Zoom Virtual Learning platform and those using conventional methods, in favour of boys.

As part of the national emergency response, the study recommends that teachers be sensitised on the use of virtual platforms, and how to leverage the strengths of virtual platforms to the regular classroom. The study recommends that schools and other learning institutions should offer clear support for both learners and instructors in using online classes, making use of a few available devices, with the aim of enhancing their convenience.

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