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Original Research Article

Technology applications in out-of-school time and performance in home assignments among primary school learners in Meru District, Tanzania

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This paper sought to establish whether the increased use of technology during out-of-school time (OST) by primary school learners improves their academic performances in home assignments. Null Hypothesis tested in this study states that: The improvement in the speed of the use of educational technology by primary school learners during OST will not improve their performance in home assignments. This paper reports the findings of quasi-experiment that involved class six pupils from 6 day primary schools with experimental and control groups of 110 and 46 pupils respectively. Materials used were mainly the Digital Video Disk (DVD), question booklets, and answer booklets. Descriptive statistics and t-test were deployed for data analysis. The t-test (t = 3.20, p (0.002) <α (0.05)) established that the performance in home assignment of the experiment group improved significantly compared to control group. Thus, it was concluded that the increased use of educational technologies in OST, improves the performance in home assignments among primary school learners. Teachers are recommended to assign pupils home works that require the use of educational technology for pupils to take the advantage of the 21st technology oriented century.

Key words: Out-of-school time, educational technology, academic performance, home assignment, primary school learners.

INTRODUCTION

The integration of technology in teaching and learning processes is a pre requisite for fully realization and development of learners' potentials for the demands of this technologically-oriented 21st century (Cynthia, 2007). Applications of educational technology is useful during out-of-school time sessions for students as it reinforces concepts introduced in school, increases parental involvement, reduces material costs, cultivates independent learning and also builds interest in school activities (Ashleigh, 2010; David, 2013). The realization of the OST potentials as a learning avenue and hence the opportunity to foster the application of educational technology is necessary to improve the academic performance of primary school learners in Tanzania.

According to Indianapolis Afterschool Coalition (2002), the OST learning involves a wide range of activities that are learned before school, after school, on weekends and during the vacations. Numerous studies suggest that participation of pupils in OST programmes is positively associated with better school attendance, more positive attitudes towards school work, higher aspirations for college, finer work habits, better interpersonal skills, reduced drop-out rates, higher quality homework completion, less time spent in unhealthy behaviour, reduced teen pregnancy, and improved grades (Clark, 1988; Hamilton and Klein, 1998; Huang et al., 2000; McLaughlin, 2000).

Statistical evidence have revealed the continuing

deterioration of education quality in Tanzanian primary schools, with respect to the performances in primary school leaving examinations (Sumra and Katabaro, 2014). According to Chanipah et al. (2000), factors that determine the status of educational quality can be grouped in three areas: home (OST) environments, school environments, and individual background. Malmberg and Sumra (2001) maintained that, in Tanzania, home environment is one of the important determinants of a supportive environment that a pupil is expected to get after classes, which in turn impacts on the quality of education achieved. Since educational technology has a potential to address the current challenges in education systems like the issues of performances, there is a need for a study that informs the educational stakeholders about the magnitude to which the use of such technologies improves the academic performance, which is the focus of this paper.

This study is a continuation of a study that tested the effectiveness of the Kiwango, Mselle and Mtahabwa (KMM) model for OST technology integration. The 'KMM model for OST technology integration' is a framework that intended to hasten the integration of educational technology in OST for primary school learners. The variables for measuring the speed of ICT use were the responses (turn over) of target users, timeliness of technology use, intensity of technology use, and the use of other educational technologies. In this case, the experimental group was treated under the principles of the KMM model while the control group was treated under the traditional practices. The experiment was administered in a period of three months. It involved class six pupils from 6 day primary schools in Meru peri-urban district of Arusha region in Tanzania. It was generally observed that the speed of educational technology application was higher in the experimental than the control group. During the same experiment, the pupils of both groups were provided with home assignments. The comparison of the scores of these assignments between the two groups were the basis for establishing whether such the increased use of technology improves the home assignments performance.

METHODOLOGY

Sampling of the Participants of the Study

The experiment was conducted for a period of one term (three months). Standard VI day primary school learners from six schools participated in the experiment. Both the experiment and control groups consisted of a total of 156 pupils who attempted the questions whereby the experiment and control groups were comprised of 110 and 46 pupils respectively. The home assignments scores were compared between the two groups.

There were considerations for a school to be selected for the experiment. One of the criteria was that, its class five or six had to have at least 30 day-scholars availed with a television at home so that they could be in a position to make use of the intended technology (DVD). The nature of the experiment district indicated that the more the distance from the tarmac road the less the availability of electricity services and hence the less the possibility of ownership and application of television. Thus, a consideration was made to schools that were located within 4 kilometres from the main tarmac whose several pupils were assumed to come from families that owned and used a television set. Another criteria was to select the public and Kiswahili medium schools of which majority of Tanzanian are enrolled and whose majority of pupils come from lower income families, compared to private and English medium schools. The purpose of selecting these kind of schools and pupils was to take care of the life conditions of the Tanzania majority as it was reported by the District education office that private schools are more expensive and comprised of the minority. On the other hand, the designing of a Kiswahili-based technology would therefore give more significant contribution to majority Tanzanians.

The researcher obtained the list of Kiswahili-medium day schools with details of their geographical locations from the District Education Officer. The first 18 schools closer to Moshi Arusha road were selected for the purpose of investigating on the number of pupils in class 5 or 6 whose family owned a television set. Apart from being asked on whether they owned a television set at home, pupils were also asked to rate the extent of supervisory support that was offered to them during the OST learning. Then, the school list was sorted according to the number of pupils with a television set at home. It was found that in class six, 12 schools out of 18 schools had at least 30 pupils with television sets at home. Therefore, the researcher sorted the list with 12 schools in the order of their OST supervisory supports. The list was then split into three categories of 4 schools each, where two schools were selected from the mid of each category. Among the selected two schools, one was assigned to experiment group and another one to control group randomly. The level of supervisory supports was thought merely as a means to sort the groups and also to ensure that the same is balanced across the two groups. The school administrators of the selected schools were then approached to seek their consent to participate in the experiment, and all of them accepted.

Procedures for the Experiment

All target pupils were provided with Digital Video Disks (DVD) for viewing the presentation of the intended topics at OST, and question booklets. There were some questions for each topic which were designed in such a way that a learner would need to view the DVD in order to answer them correctly. Each topic, for example, involved several questions which were unique to the presentation itself, like questions which were related to tools used by the presenter. The answer booklets were collected by subject teachers for marking and recording. The setting of questions and their marking schemes together with the

marking of the assignments were done by an independent panel of two mathematics primary school teachers from a different school, who were not aware of the experiment. The examiners were provided with the DVDs to view and get insight of the presentations before they could carry out their part. The group or individual with higher marks was considered better than the one with lower marks. The Statistical Package for Social Sciences (SPSS) was used for data analysis where quantitative data analysis including percentages, mean and t-test were computed and compared among the experiment and control groups.

RESULTS

The overall mean of home assignments performance for the experiment group was 83 out of 415 which is 20% compared to 43 (10.4%) for the control group scores. The mean of home work in the experiment group was therefore higher than that of the control group. The t-test established that the mean of the experiment group improved statistically significantly where: $t = 3.20$, $N1=110$, $N2=46$, $SD1 =58$, $SD2=24$, p (0.002) $<\alpha$ (0.05). Thus, the null hypothesis is rejected at 95% confidence level and concluded that the increased use of educational technologies by primary school learners, improves their performance in home assignments.

DISCUSSION

Studies have shown that the impact of technology use on the academic performance is conditional. A study by Hawi and Samaha (2016) reveals that students who are at a high risk of smartphone addiction are less likely to improve their academic performances. Also, Tabassum and Hanan (2016) study observes that though the use of technology has a direct positive relationship with students' engagement and self-directed learning, there is no significant effect of technology use on academic performance. This no relationship between the use of technology and academic performance may lead to an assumption that when students are exposed to technology without proper guide, may tend to major on non-educational than educational use. This necessities the use of a scientific model that directs the optimal use of these technologies for educational pursuits.

On the other side of the coin, there are studies which confirm that, there are positive relationship between the technology use and the academic performance. Letao and Kelly (2010) study designed to investigate if 15 years old students with high frequency of computer use at school perform better than those who have limited use of it. It was found that the academic achievement of the students who use computer at school more frequently was statistically significant higher than the students from the group who used school computers less frequently.

The two contradicting findings of whether the use of technology improves the educational performance of learners concludes that, the use of technologies by learners have potentials of either compromising or improving the academic performances, depending on circumstances under which the technology is applied. Thus, Based on the above presentations, it can be said that, the use of technology for primary school learners will positively impact on academic achievements if it is highly integrated with school activities and well adult supervised. It can be argued that, the improvement in home assignment of the experiment group that was established in this study, resulted from not only the application of the technology but also the use of KMM model directs the positive use of such technologies.

Conclusion

The use of a model like the KMM model for OST technology integration provides guidelines that brings together the parents, pupils and teachers and eventually entices pupils to make use of educational technologies. The experimental testing of KMM model that has proved its ability to hasten the use of educational technology leading to improvement in academic achievement is an evidence that the use of relevant model is a prerequisite for convincing the pupils to use and benefit from the educational technologies, while at the same time avoid its abuse. Adel and Aladwani (2016) agree that the use of technology by students may adversely impact on academic achievements only when irrational use is made.

Recommendations

It is therefore recommended for the educational stakeholders to formulate and implement strategies that are capable of motivating the OST learners to effectively make use of technologies for educational pursuits. More importantly, adults should be available to supervise their children to ensure that the application of technologies by primary school learners is mainly for educational pursuits. This study encourages the research that is aiming at investigating the extent to which the use of educational technologies during OST improves the academic performances in other contexts such as the secondary schools settings. This is vital for further informing the educational stakeholders about the rationale for the application of educational technologies in broad contexts.

Conflict of interests

The authors declare that they have no conflict of interests

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