EXPLORING THE EFFICACY OF COMPUTER ASSISTED INSTRUCTION ON STUDENT'S INTEREST, LEARNING RETENTION AND ACADEMIC PERFORMANCE IN PHYSICAL AND HEALTH EDUCATION

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Abstract
The study investigated the efficacy of computer assisted instructions on the interest, learning retention and academic performance of junior school students in Physical and Health Education. The study was a quasi-experimental study conducted on 50 male and female students of Imoye Junior High School, mile 2 Amuwo-Odofin Lagos. The sample was divided into control and experimental groups on the basis of pre-test. One group (Control) was taught the course contents of Physical and Health Education with the traditional lecture method and the other group (experimental) was taught with the computer assisted instructions. After six weeks of instruction both groups were exposed to post test. To check the retention a delayed post-test (retention test) was administered three weeks after the post-test, interest was measured using interest inventory and achievement test was used for academic performance. The results show that in the computer assisted instructions the students showed more interest, had better academic performance and they retained the concepts for a long period of time as compared to the conventional method. The study concludes that adoption of CAI will improve students' academic performance, promote students' interest and improve learning retention of Physical and Health Education concepts.

Keywords: Computer Assisted Instructions, Interest, Academic performance, Learning Retention, Physical and Health Education

Introduction

Computer Assisted Instruction (CAI) is an instructional approach in which computer is used to deliver the instructional materials and evaluate the learning outcomes. It explores the blend of texts, sounds and videosfor learning process (Onasanya, Daramola, & Asuquo, 2006 cited in Suleman et al. 2017). CAI refers to any computer application in instructional settings comprising of drill and practice, simulations, instructional exercises, supplementary exercises, instructional management, database development, programming, composing usingword processors, and other different applications (Gana, 2013). CAI is an instructional approach for promoting students' interest, skills, academic performance as well as retention capacity (Suleman, Hussain, Naseer& Khalid 2017), therefore CAI can be used to arose students' interest, demonstrate correct techniques in Physical and Health Education.

The advantages of CAI method over the conventional teaching method have been reported by many scholars. For instance, Orjika (2012), stated that the advantages of CAI include; ensuring the application of proven teaching methods to students; offering equal educational opportunities for students by using the same programme; changing the role of the teacher from teaching capacity to that of a

guide. Orjika further stated that when properly handled, CAI method removes fright and embarrassment on students and brings about meaningful learning and academic achievement. Research has also shown that learners who used computers for learning have extensive self-assurance, confidence and are more efficacious and propelled to learn than those learners who are subjected to learn in traditional learning environment (Wishart, 2002). CAI helps to enable learners to focus on the physical meaning of the abstract concepts, subsequently, to get a detailed understanding of the theory (Azar &Şengüleç, 2011; Hargunani, 2010).

Students' interest in education is a motivational variable which refers to apreferred engagement of a student with a specific subject or topic. It can also be seen as the enduring predisposition of student toward a subject or topic. According to the person-object theory of interest (POI; Krapp,2000), the development of interest relies on the ongoing interactions between the environment (object) and the person. Student's interest in a particular subject can be triggered by the teachers' quality instructional approach and mastering of the subject. Interest in a particular subject or topic may improve the student's retention of what is taught.

Retention refers to positive transfer of learning, the ability to remember what was taught after a period of time. Retention means storage of information over some period which is called the retention interval (Bichi 2002). Thus, the ability to retain what one has learned is imperative in Physical and Health Education for positive transfer of skills and knowledge. According to Baker as cited by Bhalla (2013), CAI enhances students' retention. He notes that students retain 30 percent of what they read in textbooks, 40 percent of teachers' lectures and 80-90 percent of computer learning. Also, the Digital Equipment Cooperation as cited by Lawal (2019), contends that people remember 25 percent of what they hear, 45 percent of what they hear and see and 70 percent of what they hear, see and do. Thus, CAI integrates hearing, seeing and doing for better understanding, retention and academic performance.

It has been widely acknowledged that interest promotes engagement, efficiency, effort, and persistence in learning, but unfortunately, the researcher observed downward trend in interest of students in PHE. Therefore, this study explores the possibility of CAI in improving students' interest and retention in Physical and Health Education in Junior Secondary Schools in Lagos State.

Research Hypotheses

i. CAI will have no significant effect on students' academic performance in Physical and Health Education
ii. CAI will have no significant effect on students' interest in Physical and Health Education
iii. CAI will have no significant effect on students' learning retention in Physical and Health Education

Methodology

A quasi-experimental design using pre-test-post-test and post-post-test was adopted by the study. The target population were all JSS 2students of Imoye Junior High School Mile 2, Amuwo Odofin Zone of Education District V, Lagos State, totalling one hundred and nineteen (119), from which intact class JSS 2B of fifty (50) students was selected from the six (6) arms of classes using simple random sampling technique as the sample size.

The participants were divided into two groups, the experimental and the control group. The experimental group was taught using CAI while the control group was taught using convention methods only. The two groups (experimental and control) were given a pre-testto determine their academic performance and interest at entry level. Thereafter, the participants were taught some concepts in Physical and Health Education according to the current

unified scheme of work for a period of six weeks. Then, a post-test was administered to the groups in order to determine the impact of CAI and conventional methods of instruction on their academic performance and interest in Physical and Health Education. Two weeks later, the post-post-testwas administered to all groups in order to determine their levels of retention.

Students' achievement and retention was measured using physical and health education achievement and retention test (PHEART) which comprises of 20 objective questions drawn from the topics taught. Students' interest was also measured using student academic interest questionnaire. The instrument consists of 15 items that measures student interest. The instrument was validated by experts in sport psychology and a reliability co-efficient of 0.84 was found using Cronbach's alpha method. The instrument was administered pre-test and post-test to determine the impact of CAI and conventional methods on students' interest. Mean and standard deviation were used to analyse demographic data, while the t-test and ANOVA statistics generation were used to test the null hypotheses.

Results

Results revealed that 52%students were male while 48% were female. 30% of the students were below 11 yrs, 54% were between 12-15yrs, while 16% were above 15 yrs.

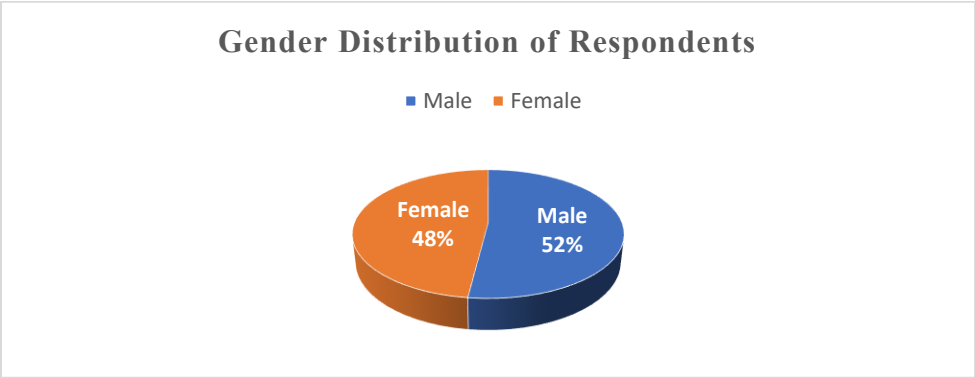

Figure 1: Gender Distribution of Respondents

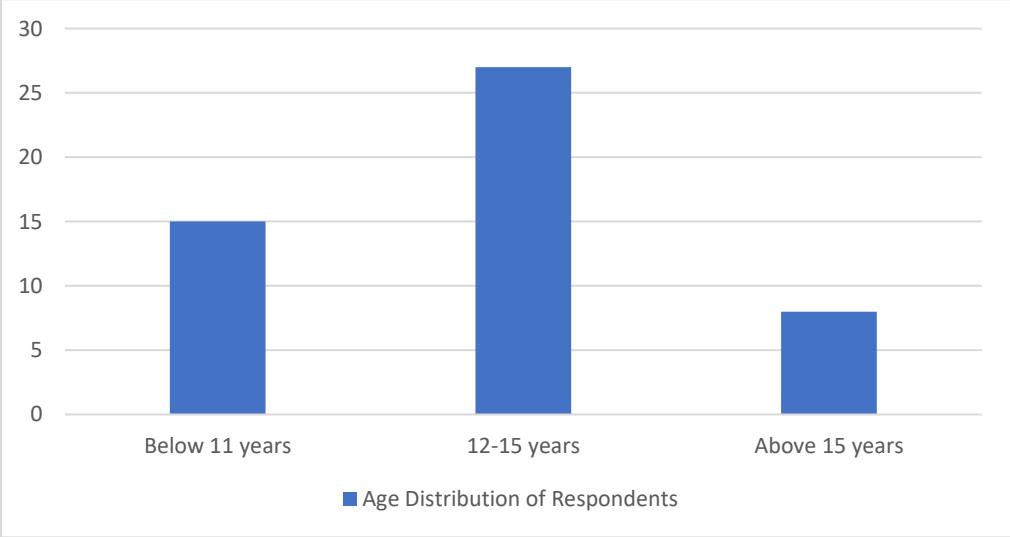

Figure 2: Age Distribution of Respondents

Table 1: Summary of ANCOVA Analysis of Students' Academic Performance

				95% confidence interval	
Group	**Mean**	**SD**	**Std Error**	**Lower bond**	**Upper bond**
Control	12.21	.83	0.25	11.69	12.72
CAI	15.98	1.58	0.26	15.46	16.51
Source	**SS**	**df**	**MS**	**F**	**Sig.**
Pretest	3.485	1	3.485	.875	.354
Methods	261.957	1	261.957	65.813	0.001
Error	187.075	47	3.980		

R Squared = .585 (Adjusted R Squared = .567)

The table 2 above, the mean scores of the CAI group was 15.98 while the mean score of the control group was 12.21. The finding shows that there was no significant difference in the pretest mean scores of the CAI and control group this shows that the students in both groups are on the same level academically. However, there was significant difference in the post test mean scores of the two groups. This indicates that the treatment has effect on their academic performance. Adoption of computer assisted instruction improved the students' performance in Physical and Health Education.

Table 2: t-test Result of Students' Retention in Physical and Health Education

Group	N	Mean	SD	Df	t	p-value
CAI	25	64.60	9.70	48	9.84	0.038
Control	25	40.82	7.23			

The result of the t-test analysis as shown in table 2 reveals that there is significant difference $t(48)= 9.84$, $p<0.05$ in the means retention of both groups. The CAI score higher than the control, this implies that the CAI group have better retention compare to the control group.

Table 3: t-test Analysis of Students' Interest in Physical and Health Education

Group	N	Mean	SD	df	t-value	p-value
CAI	25	11.08	3.11	48	3.19	0.001
Control	25	8.22	3.01			

The result of the t-test analysis as shown in table 3 reveals that there is significant difference $t(48)= 9.84$, $p<0.05$ in the mean interest of both groups. The mean score of interest of the CAI is higher than that of the control group, this implies that the CAI group has better interest compare to the control group.

Discussion

The result of the study revealed that the use computer assisted instruction has influence on the academic performance of students in Physical and Health Education. The CAI group recorded higher score in the achievement test than the control group. The difference in the achievement test score of the two groups could be because CAI combined visuals, audio and text which appeals the students for learning. The CAI can be applied in Physical and Health Education to teach practical concepts where facilities and equipment are not available instead of teaching them in abstract. Zhonghong and Shukai (2021) opined that computer-assisted instruction is beneficial in the implementation of physical education programs, especially in teaching concepts and principles of academic nature. Similarly, Surajudeen (2019) reported that CAI has influence on students' concentration during teaching and learning

of Physical Education. Likewise, Davod and Behbod (2017) reported that CAI has a significant effect on student academic achievement. In the same vein, Okoro and Ekpo (2016) concluded that students performed well when taught through ICT as compared to those who were taught via conventional instructional strategy.

Results also revealed that there is significant difference in the retention of students in CAI and control group. The CAI group had higher average retention of 64.60 than the control which recorded average retention of 40.82, this implies that students taught with CAI are able to recall what was taught better than students in the control group. The reason for this could be because CAI combined text, audio and visual in presenting the content to the student. This result agrees with previous studies, for instance, Baker cited by Bhalla (2013), asserted that CAI enhances students' retention. He notes that students retain 30 percent of what they read in textbooks, 40 percent of teachers' lectures and 80-90 percent of computer learning. Also, the Digital Equipment Cooperation as cited by Lawal (2019), contends that people remember 25 percent of what they hear, 45 percent of what they hear and see and 70 percent of what they hear, see and do. Thus, CAI integrates hearing, seeing and doing for better understanding, retention and academic performance.

Furthermore, results revealed that there is significant difference in the mean score of interest between the CAI group and the control group. The mean score of interest of the CAI is higher than that of the control group, this implies that students taught with CAI have better interest in physical and Health Education class compare to the students in the control group. This suggests that students exposed with CAI tend to have more interest in learning Physical and Health Education than those taught with lecture teaching method. The implication of this finding therefore is that CAI is more effective than lecture teaching methods in enhancing students' interest in Physical and Health Education. This finding is similar to the finding of Nwanne and Agommuoh (2017) who found that there was a significant difference in interest in physics of experimental group taught with CAI and control group taught with conventional teaching methods in favour of the experimental group.

Conclusion

The findings of this study showed that CAI has the possibility improving students' retention and academic performance in Physical and Health Education. If physical and Health Education teachers can adopt CAI in teaching and learning process, it will stimulate students' interest in the subject, improve better understanding of the content, which will help them to demonstrate and retain the conceptsfor good achievement in test and examination as well as in daily application of the skill and knowledge.

Recommendations

Based on the findings of this study, it is recommended that Physical and Health Education teachers should adopt CAI in content delivery especially for practical concepts where the equipment and facilities to teach such concept are not available. Government should provide make amenities such as power supply and internet access that are needed to facilities the adoption of CAI in teaching and learning process. Furthermore, PHE teachers should strive to acquire necessary knowledge to facilitate adoption of CAI in content delivery.

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