EFFECTIVENESS OF INDIVIDUALIZED AND COOPERATIVE COMPUTER-ASSISTED INSTRUCTIONAL PACKAGES ON UPPER BASIC SOCIAL STUDIES STUDENTS' PERFORMANCE IN KWARA STATE

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ABSTRACT

This study investigated effectiveness of Individualized and Cooperative Computer-Assisted Instructional Packages on Upper Basic Social Studies students' performance in Kwara State. Quasi-experimental study involving 3x2x2 non-randomized and non-equivalent pretest posttest control groups research design was adopted. The population of the study was all Upper Basic Social Studies students in the state. A simple random sampling technique was used to select three intact classes of basic II students, two were experimental groups and a control group. The instruments were Individualized Computer-Assisted Instructional Package, Cooperative Computer-Assisted Instructional Package and Social Studies Performance Test. The reliability of the instruments was determined using test-retest method of three weeks interval. Pearson Product Moment Correlation formula was used to analyse the data. The r obtained were 0.78, 0.79 and 0.76 respectively. Three research hypotheses were tested using ANCOVA at 0.05 level of significance. The findings of the study revealed that there were significant effects of ICAIP and CCAIP on Upper Basic students' performance ($F=18.92$, $P>0.00$); there was no significant interaction effect of gender, age, ICAIP and CCAIP on Upper Basic Students' performance in Social Studies. The study concluded that ICAIP and CCAIP were found to be more effective in enhancing Upper Basic Students' performance than ICAIP, while ICAIP also enhances the students' performance than conventional method. It was therefore recommended that ICAIP and CCAIP should be used in teaching Social Studies to enhance students' performance.

Key words: Individualised Computer-Assisted Instruction and Cooperative Computer-Assisted Instruction, Social Studies, Gender and Age

INTRODUCTION

Education is the activities and experiences put together to assist the all-round development of the learners for clear thinking and independently gaining an understanding of people and of the society in which they live. It is a process of imparting knowledge, values, technological skills and positive attitudes in the learners that will make them responsible and contribute positively to the development of the community. Education is not merely the random distribution of insert ideas, the regurgitation of pre-packaged facts, or the formal exchange of ideas between the teacher and students but how learners can clearly think, manipulate skills and transfer the learning experiences gained to solve problems by themselves and achieve their own conclusions rather than merely memorise those of others (Jimoh, 2004). This will make education to be functional and improve its quality in the country.

To fully realise the potential contributions of education to the achievement of the goals, the Federal Government took various measures to ensure proper implementation of the education policy at the upper basic level of education.

These measures included learner centered educational activities for maximum self-development and fulfilment, activity-based practical teachings, supported experimental teachings, Information Technology and relatedness of education to overall community needs. In the basic education, National Values was made a core subject. It comprises Social Studies, Civic Education and Security Education (FRN, 2014).

Social studies is a social science subject that is taught at the basic, Nigeria Certificate in Education and university levels of education in Nigeria. The subject cultivates in learners the right attitudes, values and morals that will make them effective citizens and help them contribute positively to the development of the country. It exposes children to the total experience within their environment which they need in order to live actively and successfully in the world (Ogundare, 2010). The subject develops appropriate skills and attitudes in learners that will make them to become patriots and contributors to the community. The advancement in the Information and Communication Technology (ICT) in the education sector within the nations and in the world have brought about changes in the implementation of the education curriculum. The teachers are not only to equip the learners with the basic knowledge of Social Studies content but also to acquaint them with manipulative skills which allow for self-development, continuous learning and ICT skills. To meet up with these changes therefore, there should be a shift from face to face teaching like the lecture method, note copying and dictations (in which the learners are given some content to memorize and regurgitate) to digital instructional approaches like Computer Assisted Instruction (CAI) which could be constructively used for effective teaching and learning of Social Studies. This digital approach is pupil or learner-centered. The learners are not treated as empty vessels. Rather they are credited with knowledge, skills and attitudes from the day they were born which requires development, encouragement and motivation (Adeyemi, 2012).

A computer is a modern technological device designed with the ability to receive different types of inputs and programmes, process and store them and/or output them for selected purposes. (Olumorin, 2016)., It makes life easier due to its speed, accuracy, ability to store large quantities of information and carry out large and complex operations. Computer Assisted Instruction is the means of using a computer as a medium of instruction and information delivery system in classroom situations for facilitating teacher-learner interaction for effective teaching and learning. It is the technique of using the computer to carry out the teaching and learning activities. (Odewumi, 2008). CAI is an interactive instructional package used through computers to convey and teach a lesson by a teacher as well as monitor the learning activities. One merit of CAI is to foster a comparative group atmosphere. When two or more students are working together on a single computer, there is more collaboration and cooperation in problem solving. CAI tends to therefore motivate the spirit of cooperation in an extremely powerful academic mix. It also provides a simulation of activities that the students would not have ordinarily experienced in a traditional situation (Onasanya, 2004). CAI promotes individualized instructions and cooperative learning among learners. Individualized instruction is a learning

process in which learners are given adequate and appropriate instructions purposely to help them learn the content of a subject through their own learning style and at their own pace. It takes place when a learner assumes some responsibility for his/her own perceptual strength in accord with his or her own learning style (Mezieobi, Fubara & Mezieobi, 2008). Individualized Computer Assisted Instruction is an innovative instructional and a learner-centred technique that equips learners with the necessary information and materials purposely to help them learn the content of a subject using computers as media of instructions through their own learning style and at their own pace. It has a unique characteristic that enables learners to move as slowly or as quickly as they like. Materials included in the package can be reviewed repeatedly as many times as the students require without any consequence or setback from the package. This also helps to eliminate the negative reinforcement of students as well as the lack of students' interest in the topic being taught. Individualized instruction recognizes the differences in the learner's needs, capabilities and interest consequent upon their different socio -economic and cultural backgrounds (Nnamani & Oyibe, 2016). The antonym of individualized instruction is cooperative instruction.

Cooperative learning is a collaborative learning technique that requires students work together so as to achieve instructional objectives through the sharing and collaboration of ideas and experiences (Tran, 2014). Cooperative Computer Assisted Instruction is therefore an innovative and interactive instructional package that divides students into different groups and each group is then equipped with a computer as a medium of instruction under the guidance of a teacher in order to bring about positive changes in learners' behaviour.

It encourages and motivates students to learn by providing a constantly stimulating environment for them. It also promotes enthusiasm by presenting academic content in a way that is interactive, enjoyable and suitable. It enhances students learning activities through various packages and techniques such as sharing information, learning from each other and motivating them to encourage others to learn. This may also lead to an academic competition among students. Consequently, students' interest and capacity are improved on the learning of content in Social Studies (Altun, 2015). In cooperative instruction, students are thus exposed to different types of media that they otherwise might not have experienced or interacted with in a conventional situation. Using technology in a cooperative learning setting especially in Nigeria is gradually gaining ground in secondary schools (Yusuf & Afolabi, 2010).

The procedure for organizing Computer Assisted Instruction (CAI) need to be understood by teachers. The teacher, according to Afolabi (2001), can employ the services of a professional programmer for the storage of the lesson content in the computer. The teacher should identify the lesson content area in the syllabus or scheme of work for that period. The teacher then draws the lesson content as well as the stimulus and response based on the content. The teacher will then break down the lesson content into small bits that can be studied in a few minutes. The teacher or programmer will then input the lesson content into the computer using the programming language that the students understand. Students are then allowed to interact with the computer

after giving them all the necessary information and instruction about the topic and the programme. The teacher afterwards will move round to supervise the students when they are interacting with the computer and the teacher will then collect the final feedback of the students on the lesson content for record and administrative purposes.

The feasible application of micro-computering in the Nigerian classroom for teaching and learning is also gradually gaining recognition because of the importance and educational appropriateness it offers (Onasanya, 2004). The emphasis has been increased on the individualized and cooperative instructions with modern technology to facilitate and enhance learning at all levels of education. In the Upper Basic Social Studies Curriculum, the Nigerian Educational Research and Development Council (NERDC, 2007) recommended the computer assisted instructional packages for effective teaching and learning of the subject. The packages include Simulation Games, Drill and Practice, Tutorials, Information Retrieval System, Documentaries such as on Family Life Education and Simulation Techniques that are expected of Social Studies teachers to facilitate and enhance teaching and learning of the subject. These recommended instructional strategies are innovative strategies and techniques for the teaching and learning of Social Studies without bias to gender.

Gender has been identified as one of the factors influencing the performance of students in schools (Yusuf & Afolabi, 2010). The findings on the interaction effect of gender on students' performance showed that there is no significant difference between male and female students that were taught Biology and Social Studies using CAI as a medium of instruction.

The study of Nnamani and Oyibe (2016) however discovered that female secondary school students that were taught using the individualized instructional method obtained higher mean scores than male students in Social Studies in Junior Secondary School in Ebonyi State. It becomes imperative therefore to find out whether CAI would enhance the performance of both male and female students in Kwara State.

The age of the students is considered as prerequisite in determination of students' performance and effectiveness of CAI in secondary schools. Basic education in Nigeria is provided for children within the range of 0-15 years. Studies such as Fagbemi, Gambari, Oyekum and Gbodi (2011) discovered that the younger students performed better than older ones. Similarly, Al-Mutairi (2011) observed that younger students had a tendency to perform better than matured students in a college setting in the study of factors affecting business students' performance in Arab Open University: the case of Kuwait. Many young students develop the habit of using the internet to develop themselves for social purposes. It would be a great benefit for them if they were being taught with CAI in schools. Furthermore, findings of John, Jackson, and Catherine, (2015) showed that age had a significant effect on students' performance but not on the academic motivation in the study of effect of students' age on academic motivation and performance among High School students in Kenya. Thus, it is necessary to investigate interaction effect of age on performance of students exposed to CAI in Social Studies in Kwara State.

that using a computer assisted instruction has a significant effect on students' performance rather than the traditional instruction. Adedamola (2015) and Yusuf and Afolabi (2010) among others discovered that using CAI as a medium of instruction in class activities has a significant effect on senior secondary students' performance in Biology while Tukur, Abubakar and Isiyaku (2014) discovered that CAI has no significant effect on students' performance in Basic Science. As a result of the inconclusiveness of these research findings, this study on the effect of CAI on students' performance is thus deemed necessary.

Findings of Adedamola (2015) on the effects of CAI on students' academic achievement revealed that the use of CAI improved the understanding of the content of the subject and also improved students' academic performance. However, many teachers do not use Computer-based instructional packages in classroom situations. It was discovered that in many of the schools, only computer systems that were available were mostly used for storage purposes and information processing. Most of the teachers found it difficult to apply technology in the class because they lacked knowledge of the modern technology (Olokooba & Abdulsalam 2016).

Fagbemi et al (2011) investigated the effects of CAI on students' performance and discovered that students that were exposed to self-instructional computer-based package performed better than those exposed to the conventional method of instruction. However, Adeyemi (2012) conducted a study on the effects of CAI on students' achievement and found out that students that were exposed to CAI were not significantly better in their performance in Social Studies than A computer-based instruction is effective in improving learners' performance in science subjects. Several researches had shown their counterparts that were exposed to the conventional method. This inconclusiveness also makes the study of the effects of CAI on students' performance in Social Studies necessary.

Research Hypotheses

The following null hypotheses were hereby postulated and tested in the study.

Ho_1: There is no significant effects of treatments (ICAIP and CCAIP) on upper basic students' performance in Social Studies.

Ho_2: There is no significant interaction effect of gender on performance of upper basic students exposed to the treatments (ICAIP and CCAIP) in Social Studies.

Ho_3: There is no significant interaction effect of age on performance of upper basic students exposed to the treatments (ICAIP and CCAIP) in Social Studies.

METHODOLOGY

This study adopted quasi-experimental design involving 3x2x2 non-ranomized and non-equivalent pretest-posttest control group research. The population for this study consisted of all basic students in Kwara State. The target population was all Upper Basic students in the state. This study adopted multi-stage sampling technique. Firstly, upper basic schools were stratified based on senatorial districts. Secondly, a Local Government Area (LGA) was selected in each Senatorial District using the simple random sampling technique. Accordingly, Ilorin-west from Kwara-Central and Lafiaji from Kwara-North were selected. An upper basic

school was selected from the selected Local Government Areas using the purposive sampling technique based on availability of ICT facilities in the school.

Thirdly, in the selected schools an upper basic II (Junior Secondary School II) class was selected using the simple random technique where there was more than one arm. Intact upper basic class II in the selected schools was randomly assigned to the experimental and control groups for the experiment.

Research Instrument

The main instruments were the Teaching Packages (ICAIP and CCAIP) and Social Studies Performance Test (SSPT). The Individualized Computer Assisted Instructional Package (ICAIP) was an instructional package used to teach the experimental group I using computers as media of instruction while the Cooperative Computer Assisted Instructional Package (CCAIP) was an interactive instructional package used to teach experimental group II.

The packages were self-instructional, interactive packages that lasted for 40 minutes. They contained four lessons structured into modules. The topics covered in the packages were Drug Abuse, Drug Trafficking, Harmful Substances and Accidents in School: all of which were from the Upper Basic II Social Studies Curriculum. The researcher developed the packages with the assistance of a professional software developer using an Integrated Development Environment (IDE) called Microsoft Visual Studio and it was written in C# programming language and Dot Net Framework 4.5. An intrinsic programming sequence in which a single alternative window exists to reinforce concepts that appear difficult to some students was adopted. At a consistent portion of each window a search box was included that enabled students to quickly search for a sub-topic on each topic on the package. In the development of the package therefore four methodological phases were strictly followed: they were analysis, design, implementation and validation. At the analysis stage students' cognitive skills to be improved were considered as a baseline for the development of the components of the software. At the design stage a welcome screen, topics frame and other aspects of the software were defined. At the implementation stage, the software development was based on a user-centered design where the opinions, interests, needs, emotions and thoughts among others became key factors in the software's development. Validation involved evaluation by Social Studies experts for appearance, operation, logical use of spelling, grammar, readability and clarity of the content from the viewpoint of persons unfamiliar with it. In addition, end users' usability evaluation was done through a pilot study on a sample of 30 students who were not part of the sample of the study. The results obtained in the usability experience were used for the improvement of the package.

The second instrument was the Social Studies Performance Test (SSPT). It is a set of multiple-choice questions used for evaluation. It was of two folds: pre-test and post-test. It was selected from Kwara State Basic Education Certificate Examination (BECE) in the state based on the selected topics for this study. Each question was followed with four options lettered A-D out of which only one was key and others are plausible answers.

RESULTS

Three hypotheses were tested in the study. The scores of the students in the groups were analysed using the Analysis of Covariance (ANCOVA) for the null hypotheses.

Ho_1: *There is no significant effects of the treatments (ICAIP and CCAIP) on the upper basic students' performance in Social Studies.*

In order to test hypothesis 1, the scores of the students in the pre-test and post-test in Social Studies Performance Test (SSPT) on the treatments (ICAIP and CCAIP) and control group were analysed using the Analysis of Covariance (ANCOVA) at 0.05 level of significance and the result is shown in Table 1.

Table 1: Analysis of Covariance showing the Effects of the Treatments (ICAIP and CCAIP) on Upper Basic Students' Performance

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Remarks
Corrected Model	52039.71[a]	3	17346.57	405.41	.00	
Intercept	2996.81	1	2996.81	70.04	.00	
Pretest	3620.81	1	3620.81	84.62	.00	
Groups	1619.05	2	809.52	18.92	.00	S
Error	4193.16	98	42.787			
Total	402267.00	102				
Corrected Total	56232.87	101				

$P < 0.05$

Table 1 showed an F (2, 101) 18.92 with a significant value of 0.00 at 0.05 alpha level. On this basis, the null hypothesis one is rejected since the significant value .00 is less than 0.05 alpha level ($0.00 < 0.05$). This therefore implies that the treatments (ICAIP and CCAIP) have significant effects on upper basic students' performance in Social Studies.

A follow up of the post-test mean score test was used to locate where the significant effects existed among the ICAIP, CCAIP and the Control Group. The mean scores of the three groups are as indicated in Table 2

Table 2: Post-hoc Test Multiple Comparisons of Students' Scores among the ICAIP, CCAIP and Control Groups

Groups	N	Subset for alpha = 0.05		
		1	2	3
Control	36	29.11		
ICAIP	28		69.17	
CCAIP	38			77.78
Sig.		1.00	1.00	1.00

The data on Table 2 revealed that CCAIP has the highest mean score of 77.78 in subset 3. It is followed by ICAIP in subset 2 with the mean score of 67.17 while the last is the control group in subset I with the mean score of 29.11. This implies that CCAIP is the most significant package among the groups.

Ho_2: *There is no significant interaction effect of gender on performance of upper basic students exposed to the treatments (ICAIP and CCAIP) in Social Studies.*

In order to test hypothesis 2 and 3, the scores of the students in the pre-test and post-test in Social Studies Performance Test (SSPT) on the treatments (ICAIP and CCAIP) and control group on the basis of gender and age were analysed using ANCOVA at 0.05 level of significance and the result was shown in Table 3.

Table 3: Analysis of Covariance showing the Interaction Effect of Gender, Age and the Treatments (ICAIP and CCAIP) on Upper Basic Students' Performance

Source	Type III Sum of	df	Mean	F	Sig.	
Corrected Model	52551.71[a]	13	4042.44	96.63	.00	
Intercept	2516.58	1	2516.58	60.16	.00	
Pretest	3206.85	1	3206.85	76.66	.00	
Groups	1442.15	2	721.07	17.23	.00	
Gender	22.55	1	22.55	.53	.46	NS
Age	24.08	2	12.04	.28	.75	NS
Groups * Gender	35.47	2	17.73	.42	.65	NS
Groups * Age	160.31	2	80.15	1.91	.15	NS
Gender * Age	1.26	1	1.26	.030	.86	NS
Groups * Gender * Age	221.24	2	110.62	2.64	.07	NS
Error	3681.15	88	41.83			
Total	402267.00	102				
Corrected Total	56232.87	101				

P > 0.05

Table 3 revealed the interaction effect of gender with F-Value = 0.53, with their p-value as 0.46 and at a degree of freedom 1/88 computed at 0.05 level of significance. On this basis, the null hypothesis two is not rejected since the significant value .46 is greater than 0.05 alpha level (.53 > 0.05). This implies that there was no significant interaction effect of gender on performance of upper basic students exposed to the treatments (ICAIP and CCAIP) in Social Studies.

Ho_3: *There is no significant interaction effect of age on performance of upper basic students exposed to the treatments (ICAIP and CCAIP) in Social Studies.*

Table 3 revealed the interaction effect of age with F-Value = 0.28 with their p-value as 0.75 respectively, and at a degree of freedom 1/88 computed at 0.05 level of significance. On this basis, the null hypothesis three is not rejected since the significant value 0.75 are greater than 0.05 alpha level 0.28 > 0.05 respectively. This implies that there was no significant interaction effect of age on performance of upper basic students exposed to the treatments (ICAIP and CCAIP) in Social Studies.

Discussion of Findings

The findings of this study revealed that there were significant effects of the treatments (ICAIP and CCAIP) on upper basic students' performance in Social Studies. This implies that students who were taught with the treatments (ICAIP and CCAIP) performed better than their counterpart taught without the packages. Although students who were taught with CCAIP the study was consistent with the findings of Gambari et al. (2016) who reported that there was a significant difference in the performance of the students who were exposed to cooperative, competitive and individualized instructional strategies in Geometry in Minna, Niger State. The significant difference was in favour of cooperative group among the groups in the study. Similarly, the finding of this study supported the findings of Yusuf and Afolabi (2010) who discovered that the performance of senior secondary students who were exposed to cooperative computer assisted instruction and individualized computer assisted instruction performed better than their counterparts that were exposed to the conventional instruction in Biology in Oyo State.

This shows the effectiveness and efficiency of the computer assisted instructional packages on the teaching and learning processes and students' performance in schools. This finding may be as a result of innovative and interactive nature of the packages.

Furthermore, the result of this study showed that there was no significant interactive effect of gender on performance of upper basic students exposed to the treatments (ICAIP and CCAIP) in Social Studies. This implies that gender and age has no significant interaction effect on performance of upper basic students exposed to the treatments (ICAIP and CCAIP) in Social Studies. Packages were very friendly to both male and female students. This finding was in This finding was in line with the findings of Adedamola (2015) and Fagbemi et al. (2011) who reported no significant difference between

Biology in Osun State and Social Studies in Niger State respectively. This finding of the study was thus in contrary to the findings of Nnamani and Oyibe (2016) that female secondary school students who were taught using individualized instructional method obtained higher mean scores than male students in Social Studies in Ebonyi State. This finding may be as a result of the geographical locations and instrumentation used in the studies.

The study further revealed that there was no significant interactive effect of age on performance of upper basic students exposed to the treatments (ICAIP and CCAIP) in Social Studies. This means that the performance of upper basic students taught with the packages does not in any way depend on the age of the students. Students of different age groups could cope and perform better in schools. CCAIP and ICAIP enhance and facilitate effective learning among the students regardless of their age. The finding of the study was contrary to the findings of Fagbemi, et al. (2011) who found out that pupils of the lower age (9-10 years) performed significantly better than the pupils of older ages (11-12, 13-14 years) in primary schools in Niger State. The findings of the present study also is contrary to the findings of John et al. (2015) who discovered that age had a significant effect on students' performance. The contrary in the studies may be associated with the level of education used, sample as well as the geographical location of the studies.

CONCLUSION

Based on the discussion of the findings of the study, it was concluded that Cooperative Computer-Assisted Instructional Package (CCAIP) and Individualized Computer-Assisted Instructional Package (ICAIP) should be encouraged by teachers especially in upper basic schools as they have effectively improved the performance of the students in this study. Furthermore, the moderating variables of gender and age of the students have no statistically significant interaction effect on the upper basic students' performance while using ICAIP and CCAIP in Social Studies. Therefore, gender and age of students do not significantly and statistically affect their performance in upper basic schools when ICAIP and CCAIP are used to teach and learn Social Studies.

Implication of the Study

The implication of the study is that students can perform better in other social science subjects with ICAIP and CCAIP as innovative and instructional packages regardless of their gender and age at any level of education.

Recommendations

Based on the findings of this study the following recommendations were made.

1. Teachers should use Cooperative and Individualized Computer-Assisted Instructional Packages especially in upper basic schools as it effectively improved the performance of students.
2. Teacher-training institutions should include ICAIP and CCAIP in the curriculum of teacher education as innovative instructional techniques that promote student-centred methods.
3. Students should be given equal opportunities in the teaching and learning processes irrespective of their gender and age as these characteristics do not affect students' performance.

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