

The Effect of Cooperative Computer-Assisted Instructional Package on Upper Basic Students' Performance in Social Studies

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ABSTRACT

This study investigated the effect of a cooperative computer-assisted instructional package on upper basic Social Studies students' performance in Nigeria. The study adopted a quasi-experimental design. A simple random sampling technique was used to select two intact classes. The two instruments used were Cooperative Computer-Assisted Instructional Package and Social Studies Performance Tests. All hypotheses were tested using Analysis of Covariance at a 0.05 level of significance. The study's findings showed a significant effect of the treatment on Upper Basic students' performance in Social Studies ($F=18.92$, $P>0.000$); there was no significant interaction effect between gender, age, and the treatment on the students' performance. The study concluded that treatment was more effective in enhancing students' performance than the conventional method. Accordingly, teachers should be encouraged to use Cooperative Computer-Assisted Instructional Package in teaching students to sustain gender friendliness in classroom situations.

Keywords:

Cooperative Computer-Assisted Instructional Package; Upper Basic Schools; Social Studies; Gender and Age.

ABSTRAK

Studi ini menyelidiki pengaruh paket instruksional berbantuan komputer kooperatif pada kinerja siswa IPS dasar atas di Nigeria. Penelitian ini mengadopsi desain eksperimen semu. Teknik simple random sampling digunakan untuk memilih dua kelas utuh. Dua instrumen yang digunakan adalah Paket Pembelajaran Berbantuan Komputer Kooperatif dan Tes Kinerja IPS. Semua hipotesis diuji menggunakan Analisis Kovarians pada taraf signifikansi 0,05. Hasil penelitian menunjukkan bahwa ada pengaruh

yang signifikan perlakuan terhadap prestasi belajar IPS siswa Basic antara jenis kelamin, usia dan perlakuan terhadap prestasi belajar siswa. Studi ini menyimpulkan bahwa pengobatan ditemukan lebih efektif dalam meningkatkan kinerja siswa daripada metode konvensional. Oleh karena itu direkomendasikan bahwa guru harus didorong untuk menggunakan Paket Instruksional Berbantuan Komputer Kooperatif dalam mengajar siswa untuk mempertahankan keramahan gendernya dalam situasi kelas .

Kata kunci:

Paket Pembelajaran Berbantuan Komputer Koperasi; Sekolah Dasar Atas; Penelitian Sosial; Jenis Kelamin dan Usia.

1. Introduction

There is no best method for teaching specific academic subjects in classroom situations. However, there are teaching strategies that are more suitable and capable of enhancing students' academic performance than some others, depending on lesson objectives, learners' characteristics, nature of subject matter, teachers' competence in the use of different strategies, and availability and access to required instructional resources (Ogbaji, 2017). Social Studies is an academic subject that different societies use to inculcate in the pupils the knowledge, skills, attitudes, values, and behavior it considers important concerning the human relationships among themselves and with their environment (Olokooba, 2021).

According to Okunloye (2018), Social Studies is an integrated school subject that focuses on studying human-environmental relationships for citizenship education. In the same view, Mezieoba, Fubara, and Mezieoba (2008) view Social Studies as an integrative field of study which studies human symbiotic relationships with the environment. It also equips humankind with the reflective or contemplative capacities and the intellectual, affective, and social skills that will enable them to understand their world and problems and rationally solve or cope with them for effective living in society. Yusuf (2005) states that there is hardly any limit to the number of fields or forms of knowledge integrated into Social Studies. Therefore, it was further identified that the scope of Social Studies extended to academic subjects such as Economics, Geography, History, Government, Sociology, Anthropology, Religious studies, Biology, and Technology, among others. The observed differences in the scope of Social Studies notwithstanding, Social Studies across different educational systems have a common focus on integrated content, youth-related problem-solving, societal-related problems, citizenship education, and culture-centeredness of social studies knowledge, attitude, and values (Abdulsalam & Olokooba, 2021).

The teaching of Social Studies in Nigerian Basic Schools has been dominated by conventional teacher-centered teaching strategies, emphasizing content transmission with a greater focus on achieving cognitive-based objectives (Olaniran et al., 2017). The emphasis of Social Studies curriculum contents on human-environmental relationships and personal and societal problem-solving is gradually shifting the teaching of Social Studies from the conventional teacher-centered to

activity-centered and instructional material-mediated teaching strategies (Ogundare, 2010). These focus on seeking truth and informed solutions to societal vices or problems and include problem-solving, learning by doing, and discovery-learning. Learner-centred or activity-centered teaching strategies such as cooperative learning and computer-assisted instructional strategies enable learners to participate in teaching-learning processes (Doris, 2019) fully.

Cooperative learning is a collaborative learning technique that requires students to work together to achieve some goals through sharing and collaborating ideas and experiences (Tran, 2014). It is an instructional strategy in which teachers organize students into small groups with a particular task assigned to each group under the teacher's supervision to help one another learn academic content. Cooperative learning is a process that involves working together in groups, developing a product at the end, and examining both the product and the cooperative learning skills (Altun, 2015). Many cooperative learning strategies are designed to achieve different objectives. These include Learning Together (LT); Group Investigation (GI); Jigsaw Procedure (JP); Student Teams Achievement Divisions (STAD); Team Assisted Instruction (TAI); and Cooperative Integrated Reading and Composition, among others (Yusuf, Gambari, and Olumorin 2012). Learning Together as cooperative learning was considered in the study. It is an aspect of cooperative learning that allows students to work together to achieve instructional objectives through sharing and collaborating ideas and experiences using a computer as a medium of instruction in classroom situations (Gambari et al. 2016).

Principles and requirements for implementing the Cooperative Learning Instruction (CLI) are positive interdependence, individual accountability, face-to-face interaction, social skills, and evaluation of the group processing (Altun, 2015). In positive interdependence, each student depends on the other group members to complete the assignment. Individuals thus complement one another. Individual accountability is the evaluation of the student's performance and the effect of the result on student and group success. Face-to-face interaction among the group members will enable them to reach success by helping each other and sharing ideas. The interaction increases the sense of responsibility and social solidarity among students. The students acquire social skills better when they are in a group in cooperative learning. Evaluation of the group processing at the end of the group work allows students to gather and discuss the productivity of the project and the achievement of the goals (Johnson & Johnson, 2008). Positive interdependence results in a reciprocal interaction among students and promotes each group member's productivity and achievement. Interactions occur as students encourage and facilitate each other's efforts to accomplish the instructional objectives. In cooperative learning groups, students are required to interact verbally with one another on learning tasks, exchange opinions, explain things, teach others and present their points as contributions to the discussion (Gambari et al., 2016).

Social and interpersonal skills such as listening attentively, questioning cooperatively, and negotiating respectfully are important skills that help students cooperate effectively in a group (Johnson & Johnson (1999). Each group member must know how to coordinate the group, make decisions and resolve conflicts that may arise among group members. To coordinate with others to achieve mutual goals, participants need to have confidence in and trust each other, communicate accurately, accept and support each other and resolve conflicts constructively (Gambari et al., 2016).

Group processing helps to improve the effectiveness of group members in cooperative learning and to contribute meaningfully to the assignment at hand to achieve the instructional objectives (Yamarik, 2007). It clarifies and improves the effectiveness of the members in contributing to the joint efforts to achieve the group's goals. Jirasak (2015) associated using CIL with appropriate task coordination that will facilitate problem-solving, high-quality achievement, creative thinking skills, and social development of learners in achieving complex tasks. The strategies involve teacher-student interaction, student-student interaction, student-material interaction, and students' role expectations.

In a teacher-student interaction in cooperative learning, a teacher creates a conducive learning environment, introduces the content to students, constructs learning conditions, and provides a guideline on the task for students to take an active part in the learning process and use their knowledge and learning style to achieve the goal. In a student-student interaction, students interact with the group members on a task at hand to understand that they can help, support, collaborate, and enhance learning activities. On the other hand, a student-material interaction allows students to interact with the instructional materials purposely to facilitate and enhance the lesson (Oladosu, (2016). The students study the learning materials for group tasks and share the obtained knowledge among group members as learning experiences. Students' role expectations aim to assign roles to them to develop positive interaction and responsibility. Each group member must have a clear role and take an active part in the group activities to achieve the goals (Olokooba, 2019). The cooperative instructional strategy could be incorporated into computer-assisted instructional strategy as the former is a learner-centered strategy while the latter is an activity-centered strategy.

A Computer Assisted Instruction (CAI) is an automated instructional strategy in which a computer is used to present an instructional program to the learners through an interactive process on the computer under the supervision of a teacher. CAI is an aspect of e-learning facilities teachers use to facilitate and enhance effective teaching in the classroom (Imleesh, Humiada & Hasibuan, 2020). There is an interaction between the learner and the computer. The learner responds to the computer's illustration (Gambari et al., 2016). Patrick Suppes of Stanford University, U.S.A., firstly developed the CAI in 1969. According to Dap-og and Orongan (2021), CAI is using the computer on a time-shared basis to perform any instructional functions. The functions include presenting materials or problem situations, guiding learners' thinking, responding to learners' questions, assessing learners' performances, selecting materials to be delivered, assigning tasks to be performed, or a combination of all these functions. The computer-assisted instructional strategy could be individualized and cooperative among the learners. This depends on objectives, content, teaching, and learning experiences (Zubairu, 2019).

Cooperative Computer Assisted Instructional Strategy (CCAIS) is an innovative and interactive instructional strategy where learners are divided into different groups, and each group is then equipped with a computer as a medium of instruction under the guidance of a teacher to bring about positive changes in learners' behavior (Gambari et al., 2016). This instructional strategy encourages and motivates students to learn by providing a constantly stimulating environment. It also promotes enthusiasm by presenting academic content in an interactive, enjoyable, and suitable way. 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 (Daramola, Yusuf & Ansah, 2018). This may also lead to academic competition among students.

Consequently, students' interest and capacity are improved in learning content in Social Studies (Altun, 2015). 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 the country, is gradually gaining ground in schools, especially in Nigeria, as many schools are just being provided with computer laboratories and facilities for instructional purposes rather than the administrative purpose (Olokooba & Abdulsalam, 2016). In a study by Yusuf (2005) on the effect of Cooperative Instructional Strategy on students' performance in Social Studies in Ilorin, Nigeria, students exposed to cooperative instructional strategy had a mean gain score that was significantly higher than that of the control group. It was concluded that students' performance in Social Studies would be greatly improved through various instructional strategies such as problem-solving and cooperative strategies.

Gender has been identified as influencing students' school performance (Yusuf & Afolabi, 2010). The interaction effect of gender and treatment on students' performance showed no significant difference between male and female students taught Biology and Social Studies using CAI. 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.

The age of the students also affects their performance and determines the effectiveness of using CAI in secondary schools. Basic education in Nigeria is provided for children aged 0-15 years. Studies such as Fagbemi, Gambari, Oyekum, and Gbodi (2011) discover that younger students performed better than older ones. Ibukun et al. (2011) observed that younger students performed better than mature students in college. Many young students use 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. The findings of John, Jackson, and Catherine (2015) show that age significantly affected students' performance but not academic motivation. Again, Hanan, Marie-Anne, and Lori (2015) discovered that the result of the study showed that the grade of the average age of online students ($M=26.95$) was higher than the grade of the average age of face-to-face students ($M=25.14$). They did not predict the students' achievement in an online Algebra course at a college in South Texas for the fall and spring semesters years 2010 and 2013, respectively. John et al. (2015) also found out that the age of the students had a significant effect on students' performance but not on their academic motivation.

Social Studies is a particularly important subject for citizenship education, and there is a need for it to be properly taught and internalized. The persistent decline in students' performance is worrisome, especially because of the strategic importance of learning effectiveness in Social Studies for tackling terrorism and eroded positive national values in society. Furthermore, previous research has shown that conventional instruction uses textbooks that concentrate on learning knowledge-driven components of citizenship at the expense of clarified values and societal participation skills.

It becomes imperative to investigate the effect of learner-centered and relatively activity-centered instructional strategies, such as CAI, in basic schools for effective teaching and learning of Social Studies.

1.1 Research Hypotheses

Ho1: There is no significant effect of CCAIP on upper basic students' performance in Social Studies.

Ho2: There is no significant interaction effect of gender and CCAIP on upper basic students' performance in Social Studies.

Ho3: There is no significant interaction effect of school mode and CCAIP on upper basic students' performance in Social Studies.

2. Methods

This study is a quantitative research method. The research design employed in this study was a 2x2x2 pre-test post-test control group quasi-experimental design, non-randomized and intact class. The study population was all upper basic students in Kwara State, Nigeria. A simple random sampling technique was used to select a local government in different senatorial districts in the state. An upper basic school was selected in each local government using a simple random sampling technique. In the schools, the study's participants were an intact class of upper basic II students. A class was an experimental group, and the other was a control group from different Local Government Areas.

The first instrument was the Cooperative Computer Assisted Instructional Package (CCAIP), used to teach experimental groups using computers as media of instruction. The package was a self-instructional and interactive package 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 drawn from the Upper Basic II Social Studies Curriculum contents (Raufu et al., 2014). The development of CCAIP was aided by a professional software developer at the Educational Technology Department, Faculty of Education, University of Ilorin, Ilorin, Nigeria. The package was developed using an Integrated Development Environment (IDE) called Microsoft Visual Studio, and it was written in C# programming language and Dot Net Framework 4.5. The package had four interrelated methodological processes: analysis, design, implementation, and validation.

An intrinsic programming sequence in which a single alternative frame 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 search for a sub-topic on each topic quickly. The CCAIP was face and content validated by two Educational Technology experts for usability and practicability. The CCAIP was further subjected to a reliability test using a three-week test-retest involving Pearson's Product Moment Correlation (PPMC) statistics, which yielded a 0.78 coefficient. It was therefore adjudged reliable. The second instrument was the Social Studies Performance Test (SSPT). It is a 30-item multiple-choice test used to determine the effects of the treatments on the student's performance (Amao, 2020). Three Social Studies Education experts constructively validated the test items. The final version of the SSPT was tested for reliability among 20 upper basic class II

students and using test-retest within the three-week interval. The data generated were subjected to PPMC statics which yielded a 0.76 coefficient. Therefore, the SSPT was considered reliable.

The study procedures were that the students were grouped into eight groups in the experimental group. Each group had a maximum of five members and was provided with a computer for effective interaction, sharing of ideas, and collaboration among the students for instructional purposes. The teacher introduced the CCAIP by giving adequate and appropriate information about the package and described the students' activities involved in the package. The teacher allowed the students to interact on every sub-topic within the group for 30 seconds before they moved on to the next stage of the package through the computer as a medium of instruction for the groups while the teacher monitored the activities of the students and responded to the questions asked by the students in the classroom. The students were assessed after the lesson with exercises that ended each topic on the package. In the Control Group, the students were taught using the conventional method on the same topics treated with the experimental groups. Instructional materials such as charts, pictures, and images were used. After the treatment, a post-test was administered to all the students in the three groups.

3. Results and Discussion

The Experimental Group was exposed to the Cooperative Computer-Assisted Instructional package (CCAIP). The Control Group was taught using just ordinary or usual instructional materials such as charts, diagrams, and pictures. Gender and age were moderating variables. Table 1 shows the research design that was used for this study.

Table 1. Pretest Posttest Control Group Factorial Research Design

Groups	Pre-test	Treatment	Gender	Age	Post-test
Experimental group	O ₁	X	M/F	10-12/13 years+	O ₂
Control Group	O ₁	-	M/F	10-12/13 years+	O ₂

All the groups were pre-tested before the treatment. The groups were also post-tested after the treatment to determine the effects on the experimental group. **H₀₁**: There is no significant effect of CCAIP on upper basic students' performance in Social Studies.

Table 2 revealed an F (1, 73) 39.89 with a significant value of 0.00 at a 0.05 alpha level. On this basis, null hypothesis two is rejected since the considerable value of 0.00 is less than the 0.05 alpha level (0.00 > 0.05). Thus, CCAIP has a significant effect on upper basic students' performance in Social Studies. A follow-up of the post-test mean score test location where the significant effect existed between Experimental and Control Groups. The mean scores of the two groups are compared as indicated in Table 2.

Table 2. Analysis of Covariance showing Effect of CCAIP on Basic Students' Performance in Social Studies

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Remarks
Corrected Model	46089.43 ^a	2	23044.71	567.78	.00	

Intercept	2867.98	1	2867.98	70.66	.00	
Pretest	2284.17	1	2284.17	56.27	.00	
Groups	1619.06	1	1619.06	39.89	.00	S
Error	2881.70	71	40.58			
Total	265620.00	74				
Corrected Total	48971.13	73				

P < 0.05

Table 3. Post-test Mean Scores in Social Studies Performance Test

Groups	N	Mean	Std. Deviation
Experimental Group II (CCAIP)	38	77.78	5.78
Control Group	36	29.11	10.59
Total	74	54.11	25.90

The result in Table 3 indicated a significant effect in the post-test mean scores of the students exposed to CCAIP with a mean score of 77.78, while the students not exposed to the treatment had a mean score of 29.11. This implies that the result favors the treatment (CCAIP) over the control group.

H₀₂: There is no significant interaction effect of gender and CCAIP on upper basic students' performance in Social Studies.

Table 4. Analysis of Covariance showing the Interaction Effect of Gender and CCAIP on Upper Basic Students' Performance in Social Studies

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Remarks
Corrected Model	46166.26 ^a	4	11541.56	283.92	.00	
Intercept	2894.77	1	2894.77	71.21	.00	
Pretest	2232.98	1	2232.98	54.93	.00	
Groups	1657.98	1	1657.98	40.78	.00	
Gender	15.34	1	15.34	.37	.54	NS
Groups * Gender	62.47	1	62.47	1.53	.21	NS
Error	2804.87	69	40.65			
Total	265620.00	74				
Corrected Total	48971.13	73				

P > 0.05

Table 4 showed an F (1, 73) 1.53 with a significant value of 0.21 at a 0.05 alpha level. On this basis, null hypothesis two is not rejected since the significant value of .21 is greater than the 0.05 alpha level (.21 > 0.05). This implies no significant interactive effect of gender and CCAIP on students' performance in Social Studies.

H₀₃: There is no significant interaction effect of school mode and CCAIP on upper basic students' performance in Social Studies.

Table 5. Analysis of Covariance showing the Interactive Effect of Age and CCAIP on Upper Basic Students' Performance in Social Studies

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Remarks
Corrected Model	46182.64 ^a	5	9236.52	225.24	.00	

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Intercept	2101.58	1	2101.58	51.24	.00	
Pretest	2136.83	1	2136.83	52.10	.00	
Groups	1406.28	1	1406.28	34.29	.00	S
Age	13.21	2	6.60	.16	.85	NS
Groups * Age	78.51	1	78.51	1.91	.17	NS
Error	2788.49	68	41.00			
Total	265620.00	74				
Corrected Total	48971.13	73				

$P > 0.05$

Table 5 showed an $F(1, 73)$ 1.91 with a significant value of 0.17 at a 0.05 alpha level. On this basis, null hypothesis three is not rejected since the significant value of 0.17 is greater than 0.05 alpha level ($.17 > 0.05$). This implies that there was no significant interactive effect of age and CCAIP on upper basic students' performance in Social Studies.

The study's findings showed a significant effect of CCAIP on Upper Basic students' performance in Social Studies. This implies that students taught with CCAIP performed better than those taught with the conventional strategy. This could be associated with the interactive nature of the instructional material that allowed the students to share ideas and experiences during the lessons and enhanced students' performance. It also encouraged slow learners in the mixed ability grouped class to learn Social Studies better. This finding is consistent with the findings of Yusuf (2005), who discovered that cooperative strategy significantly affects students' performance in Social Studies in Ilorin.

Similarly, it agrees with the findings of Yusuf and Afolabi (2010). They observed a significant difference in the performance of students exposed to CCAI in Biology in senior secondary school in Oyo State, Nigeria. The finding corroborates the finding of Tran (2014), who discovered a significant difference in the mean scores of students exposed to cooperative learning in a Psychology course at Giang University in Vietnam. The consistency and agreement of the findings of both present and previous studies could result from the innovative and interactive nature of cooperative strategy in the classroom.

This study also observed no significant interaction effect of gender and CCAIP on upper basic students' performance in Social Studies. Thus, gender does not affect the academic performance of upper basic students taught with CCAIP in Social Studies. CCAIP was equally effective for male and female students as it enhances their performance in Social Studies. It enhanced both male and female students' performance. This finding is consistent with the findings of Yusuf (2005), who discovered that gender had no significant effect on the performance of students who were taught using cooperative instruction in Social Studies in Ilorin.

Similarly, it is in line with the finding of Yusuf and Afolabi (2010), which reported no significant difference between the mean scores of male and female students exposed to CCAI in Biology. This means that CCAIP is a gender-friendly teaching strategy. The consistency of the findings of the studies could be on account of the gender neutrality of CCAIP, and the studies were similarly conducted in secondary schools.

Furthermore, this study's result revealed no significant interaction effect of age and CCAIP on upper basic students' performance in Social Studies. This implies that the performance of upper basic students taught with CCAIP does not in any way depend on the age of the students. Students

of different ages could cope and perform better in schools as CCAIP enhances and facilitates effective learning. In a cooperative instructional class, students see themselves as a team regardless of age. This finding is in line with the finding of Hanan et al. (2015), who discovered that the age of the students was not a significant predictor of their achievements in an online college; Algebra course at a college in South Texas for the fall and spring semesters for the years 2010-2013. The findings of the studies also corroborate one another as a result of the age friendliness of CCAIP in the classroom.

The previous findings on the CAI studies have discovered that the use of CAI and cooperative instruction revitalize the teaching and learning in the classroom. CAI provides learners with a functional and quality education that could lead to creativity. Cooperative instruction develops learners' spirit of teamwork and togetherness, leading to effective understanding in the classroom. The reviewed literature, therefore, showed that different researchers had worked on the effect of CAI on students' performance in various subjects. These subjects include Biology, Basic Technology, Mathematics, and Physics, among others, in secondary school, while the present study was on Social Studies.

The previous studies differed from the present study in the sample of the studies, statistical tools, instrumentation, and geographical location of the studies. For instance, while Yusuf and Afolabi (2010) and Adedamola (2015) drew the sample of their study from senior secondary students in Oyo and Osun States, respectively, Nnamani and Oyibe (2016), Tran (2014) drew their sample from junior secondary students in Ebonyi State and Vietnam respectively. The present study sample was drawn in Kwara State. The present study's findings were consistent with previous studies on student performance improvement. Furthermore, findings on the intervention variables such as gender and age in the present study were also in line with some previous studies as the variables statistically have no significant interactive effects on students' performance.

4. Conclusion

Based on the study findings, it was concluded that Cooperative Computer-Assisted Instructional Package should be encouraged by teachers especially in upper basic schools as they have effectively improved the student's performance in this study. Furthermore, the moderating variables of gender and age of the students have no significant effects on the upper basic students' performance while using CCAIP in Social Studies. This implies that gender and age of students do not significantly affect their performance in upper basic schools when CCAIP is used to teach Social Studies. Future studies in cooperative computer-assisted instructional strategy could be conducted on other social science subjects that could serve as the basis of comparison with this study and its effectiveness on students' performance.

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