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Effect of Computer Assisted Instruction on Teaching of Self Reliance Skills for Sustainable Entrepreneurship Development among Undergraduate Social Studies Students in Kaduna State

Uthman Shehu Lawal
Department of Social Development
Shehu Idris College of Health Sciences and Technology
uthmankad2000@gmail.com

Yunusa Abdullahi
Exam Office
National Teachers' Institute
abdullahiyunusa92@gmail.com

Abstract
This study explored the effect of Computer Assisted Instruction (CAI) on the teaching of self-reliance skills for sustainable entrepreneurship development amongst undergraduate Social Studies students in Kaduna State, Nigeria. Three (3) research objectives, questions and null hypotheses guided the study. A quasi-experimental research design was employed. The Self Reliance Skills Performance Test (SERSIT) was used for data collection. Mean, standard deviation, t-test and two-way ANOVA statistics were used. The findings revealed that a significant difference exists between the mean academic performance and retention scores of undergraduate students taught self-reliance skills using CAI and those taught using conventional methods. No significant difference was found between the mean academic performance scores of undergraduate students taught self-reliance skills using CAI in relation to gender and ownership. Based on the findings, it was recommended, amongst others thing, that subsequent curriculum review in Social Studies should accommodate the dynamism of CAI atall levels. This will promote a student-centred instructional approach, autonomy in knowledge acquisition and self-discovery learning to ensure sustainable entrepreneurship development in Kaduna state.

Keywords: Computer-Assisted Instruction, self-reliance skills, retention, academic performance and sustainable entrepreneurship

Introduction

Nigeria's national policy on education makes it clear that the three main purposes of university education are (i) to train the minds of young people; (ii) for research activities; and (iii) to recognise achievement (Federal Republic of Nigeria (FRN, 2014). This implies that there need for paradigm in teaching and learning process by using modern technology such as CAI for inculcating the skills and attitudes for sustainable entrepreneurship development (Ezeugbor and Nwachukwu 2009). However, the possibility for tertiary institutions in Nigeria to achieve these objectives is hinder by the problems of finance, quality teaching and learning environment.

It is imperative to state at this point that, lack of self –reliance skills among majority of the university graduates has accelerated the level of crimes in the form of terror attacks, murders, political assassinations, prostitution, Yahoo fraud, armed robberies, rape, kidnappings, and all facets of violence in the society today (Nwangwu 2006). The problem is heightened by the fact that many job seekers lack practical skills to become self-employed. That is why rather than providing job for others, these people remain dependanton the government and an otherwise unpredictable private sector for job offers (Bello in Daud, 2017). Regrettably, Nigeria's educational system fails to take cognisance of the dynamics of the labour market,

and as such produces a large army of graduates who are confronted with unemployment and lack of skills for self-reliance amongst most undergraduate Social Studies students in Nigeria, and in Kaduna state in particular (Nwangwu 2006).

However, the need to appropriately address this unfortunate development led the Nigerian government, under the leadership of former President Olusegun Obasanjo, to approach UNESCO for assistance in reforming Nigerian science and technology innovation systems. The prime achievement of this reform by the former president is the introduction of entrepreneurship in the Nigerian higher education system (Nwangwu 2006; Ogunleye *et al*. 2008). Further to this, the Nigerian government made this a policy issue when it stated that "the national educational goals should include the acquisition of appropriate skills and the development of mental, physical and social abilities and competencies as equipment for individuals to live and contribute to the development of the society" (FRN 2014). Entrepreneurship education informs the most current need for undergraduate Social Studies students to become knowledgeable citizens who can use their initiatives and critical thinking skills to find solutions to contemporary human problems. Presently, the emphasis is on producing Social Studies students who will not only be able to stand on their own, but also create jobs for others.

To realise this goal, the instructional/learning process should be one that meet the global education best practices, such as the use of CAI (Ngwu 2015). Unlike traditional education, in which a philosophy of learning which is far from questioning is dominant, CAI in the simplest terms is the process by which learners "learn to fish". CAI enables learners with opportunities such as researching, planning, discovering, interpreting and inculcating skills, which are indications of active participation that can help to increase undergraduate Social Studies students' retention levels of self-reliance skills for sustainable entrepreneurship development.

Thus, Karatzoglou (2013) and Sterling (2014) point out that, achieving sustainable development does not only require technological advancement, political regulations or financial instruments. Rather, a holistic approach which employs education at all levels to develop self reliance skills and entrepreneurial attitudes among citizens. In addition, education should seek to promote students critical thinking ability for creating a sustainable future and development (Leo and Wickenberg, 2013 and UNESCO, 2015). This can be achieved through improving access to quality higher education, use of innovative methods of teaching such as CAI and developing the self-reliance skills and entrepreneurial attitudes needed to sustain development in the country. Supporting this submission, Kopnina (2012) argues that the emphasis on achieving sustainable entrepreneurship development through education requires the use of CAI which engages the students in learning situations that result in discovering and synthesizing of new facts, ideas, knowledge, theories and models for self realization, career advancement and societal betterment.

CAI is a teaching method which uses computer and other interactive media to communicate learning materials, new knowledge and as well assess learning outcomes in a systematic way to aid students' academic performance and retention. CAI uses a blend of graphs, texts, sounds and videos for the learning process (Onasanya, Daramola and Asuquo 2006; Suleman *et al*. 2017). CAI refers to all types of computer applications in instructional setting comprising drill and practice, simulations, instructional and supplementary exercises, database development, programming and composing using word processors for advancement and retention of knowledge amongst students (Cotton 2001; Gana 2013). These types of learning activities are often associated with quality learning experiences, retention levels and academic performance (Koksal, Yagisan and Aksoy 2013). Studies have it that CAI is an instructional approach for bolstering students' interest, skills, academic performance and retention capacity (Osemwinyen, 2009; Suleman *et al*. 2017).

Retention refers to positive transfer of learning which the primary essence of education is. Retention means storage of information over some period; this time period is called the retention interval (Bichi 2002). Thus, the ability to retain what one has learned is imperative in education for positive transfer of skills and knowledge (Ezeh 2009). According to Baker in Bhalla (2013), CAI enhances students' retention and academic performance. 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 in Ezeh (2009) 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. What CAI does is an integration of hearing, seeing and doing for better understanding, retention and academic performance.

Academic performance refers to how well a student is accomplishing their tasks and studies over a given period of time (Steinberger 2005). In this study, academic performance refers to all learning outcomes obtained through the course of study whether planned or unplanned, within us outside the classroom which can enhance Social Studies students' self-reliance skills and retention level. The objectives of Social Studies education in Nigeria are to assist learners to develop a capacity to learn and acquire skills essentials to the formation of self-reliance skills and attitudes for a satisfactory professional life (that is, pride in the job and sound judgement) (Lawal and Muhammad 2014). This forms part of the teaching of Social Studies at all level of the educational system in Nigeria. Utulu (2007); Lawal and Muhammad (2014) submit that education is the key for every country of the world to unlock the padlock to economic freedom and prosperity, self-reliance, social integration, technological advancement, new innovations and inventions, political independence and sovereign. Social Studies education becomes highly relevant here because its curriculum is well-planned to equip learners with opportunities which can give them self-reliance skills.

The concept of self-reliance hinges on collective and individual feelings, or the urge for self-preservation through the skilled use of available human and material resources to meet individual and group needs (Ogundowole in Nwangwu 2006). Self-reliance refers to the ability of an individual to be self-employed and productive, and for a country to be productive and not consumeristically-dependent on other countries (Muhammad 2014). Also, Lawal and Muhammad (2014) see self-reliance in its general sense to mean the "right and ability to set one's own goal realising as much as possible through one's own effort using one's own factors". The National Policy on Education (FRN 2014) buttresses this by referring to self-reliance as "the shaping of her destiny with her own hands". This necessitates one of the reasons for the introduction of entrepreneurship education at undergraduate level in Nigeria.

The Consortium for Entrepreneurship Education (2008) defines entrepreneurship education as one which seeks to prepare people, especially the youth, to be responsible, enterprising individuals who become entrepreneurs or entrepreneurial thinkers and who contribute to economic development and sustainable communities. Such education is not just based on text-book courses; instead students are immersed in real-life learning experiences where they have an opportunity to take risks, manage the results and learn from the outcomes. By implication, entrepreneurship education at undergraduate level is expected to inspire and motivate students to develop knowledge and skills of self reliance, fashion for venture creation and innovative skills for sustainable development. Students, irrespective of their gender and the location of their institutions, who have acquired all these skills through entrepreneurship education are likely to be positioned not only for self-reliance but also to create jobs for others.

Previous studies have established that CAI has a significant positive effect on teaching of self-reliance skills, academic performance and the retention abilities of students at different levels of educational systems across the globe. For instance, Zarie-Zavaraki and Rezaei (2011), Tegegne (2014), Zare*et al*. (2015), Wong and Ng (2016), and Zare, Sarikhani, Salari and Mansouri (2016) studies reveal that CAI had significant effects on students academic performance and retention than convention method of teaching. Thus, CAI becomes a viable

alternative to traditional classroom teaching and learning processes. However, the studies of Sibanda and Donnelly (2014) and Tegegne (2014) show no difference between conventional and ICT-supported learning on student performance, with all pros and cons considered during these studies.

Furthermore, Chen, Lambert and Guidry (2010), Alokan and Arijesuyo (2013) and Naqvi and Naqvi (2017) reveal no significant difference in the academic performance of students in relation to gender and the ownership of schools. On the contrary, the study disconfirms the results of Ngwu (2015), Opoku-Asare and Siaw (2015) and Akinwumi (2017) which indicate that students at boys-only schools have higher mean performances than those at girls-only schools.

In studies conducted by Samuel and Peter (2013), Al-Qahtani and Higgins (2013), Giannousi*et al*. (2014), Giovengo (2014), Sisco, Woodcock and Eady (2015), Banditvilai (2016) and Gambari, Shittu, Ogunlade and Osunlade (2017), a significant difference in the retention scores of students taught using CAI and those taught using conventional methods is found. Contrarily, the findings of Mooneyhan (2012) and Elmer*et al*. (2016) revealed no significant difference in the retention levels of students taught using CAI and those taught using traditional methods.

Going by the empirical studies reviewed on CAI, it is apparent that as a technological approach to teaching, it enhances the retention and academic performance of students. However, no empirical studies have proven its effect on teaching of self-reliance skills for sustainable entrepreneurship education amongst undergraduate Social Studies students in Kaduna state, Nigeria. This study sought to fill this vacuum.

Statement of the Problem

Despite the introduction of entrepreneurship education, it is obvious that up until today, thousands of undergraduate students still lack the skills required for self-reliance. This situation calls for concern and attention. Certainly, institutions of higher learning are expected to produce graduates with physical and intellectual skills which will enable individuals to be self-reliant and useful members of society. It is against this backdrop that this study explored the effect of CAI on teaching of self-reliance skills for sustainable entrepreneurship development amongst undergraduate Social Studies students in Kaduna state. To address the issue, three research objectives, questions and hypotheses were raised.

Research Objectives

The study objectives were to:

i. Explore the academic performance of undergraduate students taught self-reliance skills using CAIand those taught usingconventional methods.
ii. Discover the effect of CAIon academic performance and retention scores of undergraduate Social Studies students taught self-reliance skills in relation to gender and institutional ownership.
iii. Establish whether any difference exist between the retention scores of undergraduate Social Studies students taught self-reliance skills using CAIand those taught usingconventional methods.

Research Questions

The following research questions guided the study:

i. What is the academic performance of undergraduate Social Studies students taught self-reliance skills using CAI and those taught usingconventional methods?
ii. What is the effect of CAIon the academic performance of undergraduate Social Studies students taught self-reliance skills in relation to gender and institutional ownership?

iii. What is the difference between the mean retention scores of undergraduate Social Studies students taught self reliance skills using CAIand those taught usingconventional methods?

Null Hypotheses

The following null hypotheses were tested at the 0.05 level of significance:

HO_1 There is no significant difference between the mean academic performance scores of undergraduate students taught self-reliance skills using CAIand those taught byconventional methods.

HO_2.There is no significant difference between the mean academic performance scores of undergraduate Social Studies students taught self-reliance skills using CAIin relation to gender and institutional ownership.

HO_3.There is no significant difference between the mean retention scores of undergraduate Social Studies students taught self-reliance skills using CAIand those taught usingconventional methods.

Methods and Materials

A quasi-experimental design using pretest-post-test and post-post-test was employed. The study employed a randomised pre-test, post-test and post-post-test quasi-experimental control design. The study used two groups: experimental and control. The experimental group (EG) was taught using CAI (X1) while the control group (CG) was taught using convention methods only (X0). The two groups (experimental and control) were given a pre-test (O1) to determine their entry level. Thereafter, the participants were taught some topics in reliance-skills and entrepreneurship development for a period of six weeks. Then, a post-test (O2) was administered to the groups in order to determine the impact of CAI and conventional methods of training on their academic performance. Finally, the post-post-test (O3) was administered to all groups in order to determine their levels of retention (Shuttleworth 2009).

The target population were all undergraduate Social Studies 300 level students in Federal College of Education Zaria and Kaduna State College of Education, Gidan-Waya totalling one hundred and twenty-three (123), from which a sample of eighty (80) was selected. The Self Reliance Skills Performance Test (SERSIT) was used as the instrument for data collection. The instrument consists of thirty (30) objective questions based on the minimum requirements for the undergraduate Social Studies programme. The instrument was validated by lecturers in the Department of Arts and Social Science Education, Ahmadu Bello University, Zaria and a reliability co-efficient of 0.84 was found using Pearson Product Moment Correlation [PPMC]. Mean and standard deviation were used to answer the research questions, while the t-test and two-way ANOVA statistics generation were used to test the null hypotheses.

Results and Discussions

This section answers the research questions, tests the hypotheses and discusses the findings.

Table 1: Means and standard deviations of undergraduate Social Studies students' performance in CAI and using conventional methods

					95% Confidence Interval of the Difference	
Treatment	**N**	**Mean**	**SD**	**Mean Difference**	**Lower**	**Upper**
Experimental	40	37.79	11.333	14.042	12.142	15.942
Control	40	23.75	9.796			
Total	**80**					

Table 1 presents a summary of the means and standard deviations on academic performance of undergraduate students taught Social Studies using CAI and those taught using conventional methods. The mean academic performance scores of the experimental group (M=37.79, SD=11.333) are higher than those of the control group (M=23.75, SD=9.796). The

mean difference is 14.042 in favour of the experimental group. The 95 percent confidence interval of the difference is between 12.142 and 15.942. Therefore, students who were taught social studies using CAI performed better than those taught using conventional methods.

Table 2: Means and standard deviations on undergraduate students' performance in relation to gender and ownership

				95% Confidence Interval	
Sex	**Ownership**	**Mean**	**Std. Error**	**Lower Bound**	**Upper Bound**
Male	Federal	40.362	.943	38.509	42.215
	State	27.461	.947	25.600	29.322
Female	Federal	35.387	.912	33.595	37.179
	State	20.336	.909	18.551	22.121

Table 2 presents a summary of the means and standard deviations on academic performance of undergraduate students taught self-reliance skills using CAI in relation to gender and location. The mean academic performance scores of male students in federal institutions (M=40.362, SE=0.943) is higher than that of the male students in state institutions (M=27.461, SE=0.947). The 95 percent confidence interval of the means for male students in federal and state institution is between 38.509 to 42.215 and 25.600 to 29.322 respectively. The mean academic performance scores of female students in federal institutions (M=35.387, SE=0.912) is higher than that for female students in state institution (M=20.336, SE=0.909). The 95 percent confidence interval of the means for female students in federal and state institutions is between 33.595 to 37.179 and 18.551 to 22.121 respectively. Therefore, male students who were taught social studies using CAI performed better than female students taught using the same method, irrespective of the ownership of institutions.

Table 3: Means and standard deviations on retention level of undergraduate Social Studies students

					95% Confidence Interval of the Difference	
Treatment	**N**	**Mean**	**SD**	**Mean Difference**	**Lower**	**Upper**
Experimental	40	35.91	11.915	14.533	12.682	16.385
Control	40	21.38	8.433			
Total	**80**					

Table 3 presents a summary of the means and standard deviations on retention levels of undergraduate Social Studies students taught using CAI and those taught with conventional methods. The mean retention scores of the experimental group (M=35.91, SD=11.915) are higher than those of the control group (M=21.38, SD=8.433). The mean difference is 14.533 in favour of the experimental group. The 95 percent confidence interval of the difference is between 12.682 and16.385. Therefore, students who were taught social studies using CAI retained more about self-reliance concepts than those taught using conventional methods.

Null Hypotheses Testing

This section presents the analysis conducted using inferential statistics of the independent samples t-test and univariate analysis of variance in order to test the null hypotheses. The following null hypotheses were stated at a $p \geq 0.05$ level of significance.

Table 4: Summary of independent samples t-test of experimental and control groups

Treatment	**N**	**Mean**	**SD**	**T**	**Df**	**P**
Experimental	40	37.79	11.333	14.521	78	.000
Control	40	23.75	9.796			
Total	**80**					

Table 4 presents a summary of the means and standard deviations for the academic performance of undergraduate Social Studies students using CAI and those taught using conventional methods. The mean academic performance scores of the experimental group (M=37.79, SD=11.333) were higher than those of the control group (M=23.75, SD=9.796). The mean difference is 14.042 in favour of the experimental group. The 95 percent confidence interval of the difference is between 12.142 and 15.942. This is supported by t(78)=14.521, p=0.001; the null hypothesis which stated no significant difference to be found was rejected. Therefore, there is a significant difference between the mean academic performance scores of undergraduate Social Studies students taught using CAI and those taught using conventional methods. That is, students who were taught self-reliance skills using CAI performed better than those taught using conventional methods.

Table 5: Summary of analysis of variance on mean academic performance scores of undergraduate Social Studies students in relation to gender and institutional ownership

Source	Type III Sum of Squares	Df	Mean Square	F	P
Corrected Model	28184.117[a]	3	9394.706	91.057	.000
Intercept	457256.757	1	457256.757	4431.913	.000
Sex	4385.932	1	4385.932	42.510	.000
Ownership	23406.554	1	23406.554	226.866	.000
sex * ownership	138.464	1	138.464	1.342	.247
Error	49110.674	76	103.174		
Total	531780.000	80			
Corrected Total	77294.792	79			

a. R Squared = .365 (Adjusted R Squared = .361)

Table 5 presents a summary of the means and standard deviations on academic performance of undergraduate Social Studies students taught using CAI in relation to gender and ownership of the institutions. The mean academic performance scores for the male students in federal institutions (M=40.362, SE=0.943) were higher than those of male students in state institutions (M=27.461, SE=0.947). The 95 percent confidence interval of the means for male students in federal and state institutions is between 38.509 to 42.215 and 25.600 to 29.322 respectively. The mean academic performance scores of the female students in federal institution (M=35.387, SE=0.912) are higher than those of female state students (M=20.336, SE=0.909). The 95 percent confidence interval of the means for female students in federal and state institutions is between 33.595 to 37.179 and 18.551 to 22.121 respectively. The F-value for gender was F(1,476)=42.510, p=0.001; the null hypothesis which states no significant difference was rejected. For institutional ownership, F(1,476)=226.866, p=0.001; the null hypothesis which stated no significant difference was rejected. When gender and ownership were compared together, F(1,476)=138.464, p=0.247; the null hypothesis which stated no significant difference was retained. That is, there is no significant difference between the mean academic performance scores of undergraduate Social Studies students taught using CAI in relation to gender and location. Therefore, male students who were taught Social studies using CAI did not perform better than females taught using the same method, irrespective of the ownership of the institutions. Gender and institutional ownership are therefore not determining factors for student performance when taken together as opposed to when they are treated independently.

Table 6: Summary of independent samples t-test on mean retention scores of undergraduate Social Studies students

Treatment	N	Mean	SD	T	Df	P
Experimental	40	35.91	11.915	15.424	78	.000
Control	40	21.38	8.433			

Total	**80**

Table 6 presents the summary of the means and standard deviations on retention levels of undergraduate Social Studies students taught using CAI and those taught with conventional methods. The mean retention scores of the experimental group (M=35.91, SD=11.915) were higher than those of the control group (M=21.38, SD=8.433). The mean difference is 14.533 in favour of the experimental group. The 95 percent confidence interval of the difference is between 12.682 and16. 385. This is supported by t(78)=15.424, p=0.001; the null hypothesis which stated no significant difference was rejected. That is, there is a significant difference between the mean retention scores of undergraduate Social Studies students taught using CAI and those taught using conventional methods. Therefore, students who were taught self-reliance skills using e-learning retained more aboutself-reliance concepts than those taught using conventional methods.

Discussion

The study revealed that there is a significant difference between the mean academic performance scores of undergraduate Social Studies students taught self-reliance skills using CAI and those taught using conventional methods. This result concurs with the findings of Zarie-Zavaraki and Rezaei (2011), Tegegne (2014), Zare*et al*. (2015), Wong and Ng (2016), and Zare*et al*. (2016), who reveal that CAI learners have significantly different results when compared to traditional learners. However, the finding disagreed with the study results of Sibanda and Donnelly (2014) and Tegegne (2014) which showed no difference between conventional and ICT-supported learning on student performance with all pros and cons considered during the study time.

The study found no significant difference between the mean academic performance scores of undergraduate Social Studies students taught using e-learning in relation to gender and institutional ownership. This finding reaffirms the results of Chen, Lambert and Guidry (2010), Alokan and Arijesuyo (2013), and Naqvi and Naqvi (2017) which reveal no significant difference in the academic performance of students in relation to gender and the location of their schools. However, the study disconfirms the result of Ngwu (2015), Opoku-Asare and Siaw (2015) and Akinwumi (2017) which find that students in boys-only school have higher mean performances than those in girls-only schools.

The study found a significant difference between the mean retention scores of undergraduate Social Studies students taught using CAI and those taught with conventional methods. This is in line with the findings of Samuel and Peter (2013), Al-Qahtani and Higgins (2013), Giannousi*et al*. (2014), Giovengo (2014), Sisco, Woodcock, and Eady (2015), Banditvilai (2016) and Gambari*et al*. (2017) which revealed a significant difference in the retention score of students taught using CAI and those taught using conventional methods. However, the findings of Mooneyhan (2012) and Elmer*et al*. (2016) reveal no significant difference between retention level of students taught using CAI and those taught using traditional methods.

Conclusion and Recommendations

The study established that the use of CAI in teaching self-reliance enhanced the academic performance of many undergraduate Social Studies students. Thus, changing from conventional methods of teaching to the use of CAI not only enriches the teaching and learning process, it also significantly improvesstudents' performance in the study area. The study further established that the use of CAI was gender- and location-friendly, such that it produced a positive relationship in the academic performance of undergraduate Social Studies students. The study confirmed that CAI enhanced the retention ability of students over those taught using conventional methods in the study area.

The study recommends that curriculum review by the Nigerian Educational Research and Development Council (NERDC) should be made to accommodate the dynamism of CAI at all

levels. This will promote a student-centred instructional approach, and students' autonomy in knowledge acquisition and self-discovery learning in order to ensure sustainable entrepreneurship development in Kaduna state. Also, Social Studies lecturers should be given training by federal/state government and non-government organisations on the basic skills of applying CAI. This will help to enhance students' academic performance and self-reliance skills for entrepreneurship development, irrespective of gender or ownership of institutions of higher learning in Kaduna State and the country at large. Finally, management of Colleges of Education in Kaduna state should institutionalise the use of CAI through the provision of adequate ICT facilities in higher institutions. This will help to enhance the retention ability of students, as well as discovery skills for entrepreneurship development in the State.

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