EFFECTS OF COMPUTER AIDED INSTRUCTION ON SELF-EFFICACY IN ENGLISH LANGUAGE AMONG SENIOR SECONDARY SCHOOL STUDENTS IN GWAGWALADA AREA COUNCIL OF FEDERAL CAPITAL TERRITORY ABUJA

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Abstract: *The study investigated how the use of Computer Aided Instruction (CAI) affects students' self-efficacy in learning English language when compared with the use of Conventional Instructional Methods (CIM). The study adopted quasi experimental design, Non-equivalent Control Group Design. Four secondary schools with computer laboratory were purposively sampled for the study. The four schools were then randomly assigned to either experimental or control groups. The study sample comprised of 165 Senior Secondary Two English language students from the four sampled schools. The study involved two Experimental groups which were taught through CAI method and two Control groups which were taught through CIM (non- computer Aided methods). Data was collected using Students' Self-efficacy Scale (SSES). The instrument was administered before and after exposure of treatment (CAI) to both experimental and control group. The reliability coefficients of SSES after pilot testing was estimated using Cronbach's Alpha and an alpha coefficient of 0.76 was obtained. The researcher administered the SSES instrument with the assistance of English language teachers in the sampled schools. Data was analyzed using both descriptive and inferential statistics. The study revealed that, the students who were taught English language with CAI obtained, higher self-efficacy scores than the students who were taught with CIM. The study further revealed that girls obtained higher self-efficacy scores than boys when taught with CAI. The study recommended that CAI would be beneficial to English language teachers in adopting instructional strategies that would help improve students' self-efficacy in English language.*

Keywords: *Computer Aided Instructions (CAI), Effect, English, Secondary Schools, Nigeria*

1. INTRODUCTION

Different target of instruction incorporates into learning prepare the students to gain legitimate comprehension of fundamental guideline and application; it is likewise go for building up the students with suitable logical state of mind as a pre essential for further exploratory exercises which Nigeria as a nation can't bear to miss. So as to accomplish these targets in Nigeria, pressing requirement for compelling learning methodologies, dynamic cooperation and community oriented learning exercises get to be basic in instructing the subject.

In backing of successful learning procedure, Prokop, Tuncer and Chuda (2007) presents that educators ought to have the information of how students learn and how best to show them. The Nigerian National Policy on Education unmistakably spelt out one of its principle instructive targets as to assemble a unified, solid and confident country. The government of Nigeria has said that training is an instrument for effecting national improvement (FRN, 2006). For this rationality of training to be in congruity with Nigeria`s national destinations,

instruction ought to be outfitted towards self-acknowledgment better human relationship, national proficiency, national solidarity, English language and innovative improvement.
Innovation on its part is seen as a way or method for achieving an assignment (Drucker, 2007). Innovation is a branch of information that arrangements with the creation and utilization of specialized means and their bury association with life, society and environment (Feynman, 2005). The expectation for quality execution in national improvement these days is subject to innovation advancement and mix in classroom; this is reason for incorporating innovative instruction into teaching and learning (Agabtogun, 2011).

Innovation in training is critical at enhancing the nature of instruction, for instance; the computer can build up students` basic leadership, critical thinking abilities, information handing aptitudes and relational abilities (Whitworth, 2003). Some educators proposed that successful instructing and learning may be accomplished by utilizing more learner focused methodologies and especially those that utilize present day data and correspondence advances like the computers (Williams, 2004). These innovations can encourage information development in the classroom and aide students` exercises, giving educators the chances to connect with little gatherings and analyze their learning challenges (Williams, 2004)
Using quality instructional media, compelling learning could be accomplished. Case of such instructional media is the computer which is the most adaptable medium for direction since it can bargain at the same time with vast number of students' individual premise (Becta, 2003). Computer is seen by James (2000) as a decent learning instrument and a partner for the learner while it serves as a capable sidekick and aide to the educator. He underline more that utilizing computer program direction, the instructor can educate however many students as could reasonably be expected without over working.

In his proposal Beata (2003) state that the imaginative procedures are accomplished with the utilization of computer, as an electronic devise that works under the control of sets of nitty gritty precise directions called a project, to acknowledge, store and procedures information to deliver data in a structure required by the clients. Gambari (2006) expressed that direction with computer was found to persuade students and obviously stir their enthusiasm for what they are realizing, He proceed by saying that computer can be utilized as a data gadget to introduce instructional occasions that are outlined, created and delivered for all learning circumstances.
Computer Aided Instruction (CAI) when used to supplement the routine showing strategy would empower educating and learning of English language. Computer helped direction can be seen as apparatus for viable educating and learning of theoretical subjects like English language (Wambogu and Changaiywo, 2008). In the same vein, Sharm (2005) inferred that Computer Aided Instruction give Intuitive mode between the framework and the client, prompt input, answer for dynamic issues in a restricted period. Computer Aided Instruction is one of the most ideal approaches to stimulate the enthusiasm of learners toward the start of the lesson since it can hold their consideration and make the lesson important all through the period with a superior scholarly accomplishment appropriately used (Sharm, 2005). It an important instructional strategy for teachers as it facilitates the learner by providing individualized instruction, effective interaction with the learner and immediate feedback (Tyagi, 2014). More importantly, it provides text, graphics, audio, visual, pictures, animation and simulation in the same media to students (Olagunju, 2013). CAI programs are therefore multi-media programmes that can be used to enhance students' achievement and self-efficacy in English language.

Students` low accomplishment in English language has turned into a wellspring of worry to instructors, government and folks all over Nigeria. Clearly there is an accord that the instructive standard of Nigeria has fallen (Adebule, 2004). A few analysts have sent different reasons respect to the declining scholarly accomplishment of students in English language. In

the study directed by Bassey (2005) a few issues were connected with the traditional technique for instructing which perpetually brought about the poor accomplishment of students English language and other control. The routine address strategy as per Jack (2000) is out of date and insufficient for the present interest of more heterogeneous learner populace of today. In their journey to find the underlying drivers of poor accomplishment of students, Umeh (2003) expressed that an excessive amount of talking by educators that leaves learners detached was in charge of poor scholarly accomplishment of students. She stressed that students must not just recall what he or she has learnt only but also develop self-confidence and competence in ability to learn the subject if students' scholarly accomplishment ought to be enhanced.
Self-efficacy is defined as self-judgment of one's competence to successfully execute a course of action necessary to reach desires outcomes (Bandura, 1982). In English language academic settings, English language self-efficacy refers to students' confidence in their ability to master English language concepts, tasks and activities. Self-efficacy of students is an important aspect in learning secondary English language as it directs learners to rate their confidence for attaining a specific goal in the subject (Martin et al, 2008). Bandura (1993) posits that self efficacy beliefs affect students' outcomes by influencing students' determinations of interests, choices, efforts, perseverance, persistence, career paths and future achievement.

Bandura and Locke (2003) found that self-efficacy influence performance and ability of the learner. This means that self-efficacy is a key predictor of students' successes in academic performance. Kennedy (1996) believes that self-efficacy in subject may affect subject learning, choice of science, amount of effort exerted, and persistence in science. Smist and Owen (1994) found aptitude, attitudes, and attributions to predict science self-efficacy in high school students. Martin, et al (2008) reported a link between the level of self-confidence in learning and achievement. Baldwin, et al (1999) also stated that self-efficacy becomes more important over the duration of a course as subject concepts increase in complexity.

The low self-efficacy of students in subjects is prevalence in countries across the world (National Center for Educational Statistics, NCES (2000); Britner & Pajares, 2001; Guvercin, 2008; Kupermintz, 2002; Lau & Roeser, 2002). In Nigeria context, many secondary school students, both boys and girls appear to have low self-efficacy in English language. Some students could not work out problems considered difficult without assistance from the teacher. Researchers in self-efficacy posit that students' belief in their ability, which is the self-efficacy to succeed in English language tasks, courses, or activities, or their science self-efficacy, influences their choices of science-related activities, the effort they spend on those activities, the perseverance they show when encountering difficulties, and the ultimate success they experience in the subject (Bandura, 1997; Britner & Pajares, 2001; Zeldin & Pajares, 2000). Studies have shown a significant positive relationship between self-efficacy and academic achievement (Daine, 2003; Silver et al, 2001).

Gender self-efficacy of students in English language continues to exist in classrooms globally. For instance, in America, the American Association of University Women, AAUW (1999**)** report shows that females have lower self-efficacy in science when compared to males. This self-efficacy gender gap in languages (English language) has consistently been predominant in high school level of education where the study of English language is compulsory (AAUW, 1999). Anderman and Young (1994) reported that the middle school boys were more efficacious in science compared to girls. Lower self-efficacy of students, more specifically female students, in English language is a concern that needs to be addressed because low self-efficacy has been linked to lower academic performance.

1.1 Statement of the Problem

The persistent poor academic achievement of students in English language in both WAEC and NECO examinations have been a major concern to students, English language educators,

and researchers because of low students' self-efficacy in the subject. Judging from the Chief Examiners Reports of WAEC from 2010-2014 one could draw the conclusion that the academic achievement of students has been poor and discouraging. The students are no longer develop competence and confidence in ability to learn the subject and achieve better too. In the report of Nzewi, (2005) and Okoli (2006) teacher's use of ineffective methods and strategies like the teacher centered method of instruction in English language class contributed to poor achievement and low selfefficacy of the students. Therefore, there is need to explore alternative and effective method of instruction to enhance students achievement and selfefficacy. One of such technique is Computer Aided Instruction (CAI) which has been found affective in many subjects. Therefore, the problem of the study is to investigate the "Effects of Computer Aided Instruction (CAI) on Senior Secondary School Students` Self-efficacy in English language

1.2 Aim and objectives of the study

The aim of this study was to assess the effect of Computer Aided Instruction (CAI) on students' academic self-efficacy in English language in secondary schools of Gwagwalada Area Council of FCT. Specifically, the study sought:

1. To assess students' self-efficacy in the learning of English language when taught using computer Aided instruction and when using Conventional Instructional Methods taught.
2. To establish gender difference in self-efficacy of students in English language when taught using Computer Aided Instruction, as compared to Conventional Instructional Methods.

1.3 Research Questions

The study was guided by the following research questions:

1. What is the difference in the English language self-efficacy scores of students taught using Computer Aided Instruction and those taught using Conventional Methods?
2. Is there any difference in the English language self-efficacy scores of male and female students exposed to Computer Aided Instruction?

1.4 Hypotheses

The following hypotheses guided the study and were tested at 0.05 level of significance.

H_{01}: There is no significant difference in students' self-efficacy scores in English language between those taught using CAI and those taught using CIM.

H_{02}: There is no significant gender difference in students' self-efficacy scores in English language when students are taught using CAI.

2. METHODOLOGY

The study adopted Quasi-Experimental design using Nonequivalent Control Group Design. The study was carried out in Gwagwalada Area Council of FCT. The target population included all secondary schools with computer laboratory in the Area Council. The total population of schools with functional computer laboratory in the Council was 15 schools out of 43 schools. The total population of Senior Secondary School Two (SSS II) English language students in the 15 schools with computers was 5245. Purposive sampling was used to select the Experimental Group schools 1 and 2 had 46 and 41 students respectively, while Control Group schools 1 and 2 had 37 and 41 students respectively. The total number of students in the four groups (schools) was 165 and this constituted sample size for the study schools that were similar in academic performance because the research was a comparative study and also to select only the schools that had a computer laboratory.

The Students' Self efficacy Scale (SSES) developed by Julius (2018) was the instrument adapted for this study. The study also used the treatment instrument "Computer Aided Instruction" (CAI) software as an instructional package for the experimental groups. The questionnaire was developed by the researcher to measure students' self efficacy in English language. The instrument was used to measure the perceived English language self efficacy (confidence) of the students. Students' self-efficacy scale was used as pre-test and post-test. The items of the scale assessed students' level of confidence (self-efficacy) in mastering English language concepts, for example, generally perceived self-efficacy in English language subject and choice of English language and career courses related to English language. The SSES comprised of 12 items on a five- point likert scale namely; 1= strongly disagree, 2= disagree, 3= not sure, 4= agree and 5= strongly agree.

The CAI was developed by the researcher. The CAI program consisted of tutorials and drill and practice applications. The CAI program contained a set of quizzes, exercises and assignments at the end of each topic and sub-topics. The CAI Program also consisted of an in-built evaluative system which provided immediate responses for answers supplied by the students in the program. The reliability of the English language self-efficacy scale was estimated using Cronbach Alpha method and the reliability estimate obtained was 0.76.

The researcher trained English language teachers of the experimental groups for two hours, on how to use computer Aided instruction programme. The SSES instrument was administered by the regular English language teachers to both Experimental and Control schools as pre-treatment. The SSES lasted for about 20 minutes in one week. It was then followed by exposure of treatment (CAI) to the experimental groups in teaching the topics for a period of six weeks with one session per week. Each session lasted for 40 minutes. The treatment was administered during the normal lesson time as per the school timetable for the schools that were involved. Students in the control groups were taught the same selected topics for the same period of time with the normal English language classes (conventional methods or non-CAI). At the end of treatment period, the regular English language teachers administered the post-test CAT and SSES, and the classroom observation schedule was applied to the students in both experimental and control groups. The data collected using the questionnaire was collated and analyzed using SPSS package version 20. Data analysis was done using both descriptive (mean and standard deviation) and inferential statistics (t-tests and ANOVA).

3. RESULTS

3.1 Research Question One and Hypothesis One

RQ1: What is the difference in the English language self-efficacy scores of students taught using Computer Aided Instruction and those taught using Conventional Methods?

H_{01}: There is no significant difference in students' self-efficacy scores in English language between those taught using CAI and those taught using CIM.

Students' pre-treatment scores in Self-efficacy

Both experimental and control group students were exposed to a self-efficacy scale (SSES) before the application of treatment (CAI). The data obtained were analyzed using descriptive statistics and t-test and the results indicated in Table 1.

Table-1: Descriptive and Independent Sample t-test of pre- treatment scores in Self-efficacy

Variable	Group	N	Mean	Std. deviation	df	t-value	p-value
Self-efficacy	Exp	87	43.56	8.693	163	0.367	.573

Control	78	43.62	6.489

The results from Table-1 show that the Experimental group had an average score of 43.56 out of 60 on SSES. For control group the average score was 43.62. The t-test analysis revealed that the computed p-value (0.573) was greater than the set alpha value 0.05. Therefore, there was no significant difference in self-efficacy pre- mean scores between experimental group and control group, (df 163) = 0.367, $p > 0.05$. Thus, the Experimental and Control groups were similar on self-efficacy measure, hence they were homogenous at the beginning of the study. This made the groups suitable for the study.

Effect of CAI and CIM on Students' Self-efficacy in English language

The research aimed at investigating whether there was significant difference in students' self-efficacy in English language when taught with CAI and CIM ($H_0 1$). The overall post-test scores in self-efficacy of CAI and CIM were compared.

Overall post-test scores in self-efficacy

Self-efficacy scale was administered to the four groups after the exposure of the treatment. The data obtained were analyzed using descriptive statistics (Table 2) and Analysis of Variance (ANOVA) (Table 3).

Table-2: Descriptive Statistics of Post-test scores in Self-efficacy

group	Mean	N	Std. Deviation
Experimental group	53.76	87	7.576
Control group	42.65	78	8.923

Table-2 shows that the average self-efficacy scores of Experimental groups were higher than those of the Control groups. This indicates that the students of experimental groups who were taught English language with CAI approach were more self- efficacious in learning English language than those of the control groups. To determine whether the groups were significantly different, OneWay ANOVA was performed. The results are indicated in Table 3.

Table 3: OneWay ANOVA of Post-test scores in Self-efficacy

Source of variation	Sum of Squares	df	Mean Square	F-ratio	p-value
Between Groups	1867.546	3	825.49	18.62	.000
Within Groups	7963.490	161	43.35		
Total	9173.604	164			

The results in Table 3 show that the difference in self-efficacy post-test means scores of the students between the Experimental and Control groups was significant, $F = 18.62$, $p < 0.05$. Therefore, the hypothesis, which stated that there is no significant difference in students' self-efficacy in English language when taught with CAI and CIM, was rejected.

3.2 Research Question Two and Hypothesis Two

RQ2: Is there any difference in the English language self-efficacy scores of male and female students exposed to Computer Aided Instruction?

H_{02}: There is no significant gender difference in students' self-efficacy scores in English language when students are taught using CAI.

Male and Female Students' pre-treatment scores in Self-efficacy

Regarding difference in gender self-efficacy in learning English language, descriptive and t-test was performed. The results of analysis were as indicated in Table 4.

Table-4: Independent Sample t-test of pre- treatment scores in Self-efficacy by Gender

Variable	Gender	N	Mean	Std. deviation	df	t-value	p-value
Self-efficacy	Female	36	43.44	6,423	77	-0.327	.651
	Male	43	42.87	6.381			

The results in Table 4 show that the self-efficacy average score of male and female were 43.44 and 42.87 out of 60 respectively. Both female and male obtained relatively the same mean score. The t-test analysis showed that the computed p-value (0.593) was greater than the set alpha value (0.05). Therefore, the self-efficacy mean scores of female and male students were not significantly different, df, 77 = 0.327, $p > 0.05$. Thus, the female and male student samples were similar before the application of the treatment.

Post-test scores in Self-efficacy by Gender

The research aimed at establishing whether there was significant difference in self-efficacy in learning English language by gender when students were taught with CAI. Descriptive statistics was performed to describe the difference of self-efficacy scores between male and female students. The results are indicated as in Table 5.

Table-5: Descriptive statistics of post-test Scores in Self-efficacy by Gender

Variable	Sex	N	Mean	Std. Deviation	Std. Error Mean
Self-efficacy	Male	45	48.89	7.083	1.089
	Female	46	51.76	6.905	

From Table-5, it is apparent that the average self-efficacy post-test scores of females were relatively higher than those for the males. This indicates that females were more confident in learning English language than males when they were taught with CAI. In order to determine whether the difference in self-efficacy post-test scores by gender was statistically significant, an independent sample t-test was carried out. The results are shown in Table 6.

Table-6: Independent sample t-test of post-test scores in Self-efficacy by gender

Variable	Gender	N	Mean	Std. deviation	t-value	df	p-value

Selfefficacy	Male	45	48.89	7.083	1.893	89	.0.243
	Female	46	51.76	6.905			

The t-test analysis results in Table 5 shows that the difference in self-efficacy post-test mean scores between male and female students was statistically significant, ($t(89) = 0.243$, $p < 0.05$. Thus, H_{02}, which stated that there is no statistically significant difference in selfefficacy English language mean scores by gender when students are taught using CAI method was rejected. This revealed that on average girls obtained a higher English language self-efficacy mean score than boys. From the findings of this study, it is clear that use of computer Aided instructional method enhances English language self-efficacy of female more than it does to the male students.

4. DISCUSSION OF FINDINGS

The finding of this study revealed that CAI had significant effect on students` efficacy in English language as shown in the research question one and hypothesis one. The experimental group had higher mean self-efficacy score and the difference in self-efficacy post-test means scores of the students between the Experimental and Control groups was significant. This implies that the use of CAI was more positive and effective in enhancing and facilitating students` self efficacy in English language than the use of the conventional method

The findings of this study are in agreement with the report by Fencl and Scheel (2005) which investigated the effects of different teaching methods on the classroom climate and selfefficacy in non-majors Physics students. The results indicated that use of electronic applications had a positive correlation with increased self-efficacy in non-majors physics students. The findings of this study are in agreement with findings of Chen and Liu (2013) observed that grade 5 students from elementary school in Northern Taiwan demonstrated effectiveness in learning science when taught through computers. Similarly, Yien, et al (2011), observed that computer Aided learning was more effective in enhancing the self-efficacy of students in learning nutrition course than conventional methods.

The findings of this study may be explained in line with the study of Zimmermam (2000); Pajares and Miller (1994) which observed that learning skills acquisition enhances self regulated learning behavior which in turn ensures motivation and confidence as a learner engages in learning tasks. The confidence to approach learning in an independent manner which promotes the belief in one's ability to execute a given task may invariably lead to enhanced self-efficacy. The instruction in CAI could have been the reason for the higher self-efficacy demonstrated by students in treatment condition.

The findings of the present study concurs with the results of Britner and Pajares (2006), which reported that the middle school girls had higher science self-efficacy than do boys. The findings of this study found similar results, which indicate that there exists a gender difference in science self-efficacy (DeBacker & Nelson, 1999). In addition, the findings of this study agrees with the report of (AAUW, 1999) that suggested, females are more likely to take both Biology and English language in high school than males. Moreover, the findings of this study finds support from Bandura (1997) argument that gender can influence academic performance through its mediating effects on self-efficacy.

This study has revealed that female students obtained higher English language self-efficacy scores than male students as shown in table 5 and the difference was significant as revealed also in table 6. This implies that use of CAI in classroom instruction can and do make a difference to gender's self-efficacy with female students being more efficacious in

learning English language. Thus, CAI plays a crucial role in enhancing girls' self-efficacy more than their counterpart boys. This study is in agreement with the findings of Julius (2018) who discovered CAI instruction increase the self-efficacy of female students in Chemistry. The CAI approach provides an immediate feedback and reinforcement to each and every question to the learners. It also allows the learners to make as many trials for the question as they can. This kind of learning environment enables the female students to build more self-efficacy in the learning English language tasks and concepts than male students. With CAI environment, the girls, may persist and persevere in the learning by answering as many questions as possible and also making several trials to each question. Therefore, the type of learning environment is a crucial factor that enables the female students to better their self-efficacy in English language than the male students.

5. CONCLUSION

From the pre-testing findings, it was evident that the administration of pre-tests to the Experimental and Control groups did not interact significantly with the treatment (CAI). Therefore, greater scores in English language self-efficacy by the experimental groups than control groups were not as a result of effect of pre-tests but as a result of effect of the treatment (CAI). The findings of the study showed that the students who were taught English language with Computer Aided Instruction method obtained higher English language self-efficacy mean scores than the students who were taught with Conventional Instructional Methods. The study therefore, concludes that use of computer Aided instruction method enhances students' self efficacy in learning English language more than use of Conventional Methods. CAI seemed to capitalize on students' active participation in the course material or concepts learning. It also follow that CAI provide opportunities for students' group work which have a dual outcome of improving both self-efficacy and academic achievement. This is particularly an impressive instructional strategy, and worth adopting by English language teachers.

The findings showed that the female students scored higher self-efficacy mean scores than the male students when taught with computer Aided instruction method. This implies that use of computer Aided instruction method has a greater impact on female's self-efficacy in learning English language than the males. It is apparent that the use of CAI in classroom instruction can make female students more self-confident in learning English language. Therefore, teachers of English language, more so in girls' schools need to incorporate CAI in their teaching in order to improve motivation of girls which has been reported to be low by many studies.

5.1 Recommendations

Based on the findings and conclusions of this study, some recommendations have been suggested hereunder.

1. English language teachers should be encouraged to use Computer Aided Instruction (CAI) in their teaching so as to improve students' self-efficacy in English language that has remained low for decades of years.
2. Teacher training institutions such colleges and universities should emphasize Computer Aided Instruction Method as part of their English language training curriculum.
3. The Nigerian Educational Research and Development Council should emphasize use of computer Aided instruction method as one of the teaching methods in secondary school English language curriculum.
4. The government of Nigeria should provide adequate ICT infrastructure and equipment, including computer hardware and software (CAI) in all schools. Availability of adequate

computer Aided instruction hardware and software in schools will enable the English language teachers to utilize available CAI approach in the teaching and learning processes.
5. School administrators should endeavor to provide an enabling environment for the use of CAI. This they can be done by either providing or expanding existing ICT resources or facilities in schools to help foster enhanced CAI. They should also provide incentives to motivate English language teachers so as to empower them to better use CAI in their teaching and learning activities

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