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CONTENTS

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INTRODUCTION

REVIEW OF LITERATURE

NEED/IMPORTANCE OF THE STUDY

STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESES

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

CONCLUSIONS

SCOPE FOR FURTHER RESEARCH

ACKNOWLEDGMENTS

REFERENCES

APPENDIX/ANNEXURE

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- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

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- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

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- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

INTEGRATION OF TECHNOLOGY IN TEACHING SENIOR HIGH SCHOOL SOCIAL STUDIES: THE COMPUTER ASSISTED INSTRUCTION EFFECT ON STUDENTS' PERFORMANCE

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ABSTRACT

Social studies educators increasingly support the use of computer-assisted instruction to transform social studies education from a traditional mode to a more constructivist, student-centered, and active mode. This study investigates the impact of computer assisted instruction (CAI) on students' performance in social studies. The study was a true experimental research involving a pretest and posttest analyses. Learning package was used as the instrument to examine students' performance when using computer assisted instruction rather than the traditional method of instruction. The sample for the study comprised 40 first year students of Bawku Senior High in Bawku Municipal Assembly in Upper East Region of Ghana. The students' pre-test and post test scores were analyzed using independent-samples t-test. The findings of the study showed that the performance of students exposed to CAI (experimental group) was better than that of their counterparts exposed to the conventional classroom instruction (control group). Based on the research findings, recommendations were made on the need to develop relevant CAI packages for teaching social studies in Ghanaian Senior High Schools.

KEYWORDS

Computer Assisted Instruction, Social Studies, Students' Performance, Traditional Method of Instruction.

INTRODUCTION

At the beginning of the millennium, education authorities in Ghana embarked on a number of projects to introduce Information and Communication Technologies (ICTs) into the Ghanaian education set up especially, at the basic and secondary school levels. For instance, in the middle of the 1990s, educational providers realized that Ghanaian professionals could not compete on the global market for jobs, because they were limited in skill, especially in the area of Information Technology (Dadebo, 2003).

Subsequently, the authorities incorporated the study of ICT as part of the study of science. The government of Ghana with the collaboration of Non-Governmental Organizations (NGOs), philanthropists and Parent-Teacher Associations (PTAs) built about one hundred and ten science resource centres to aid the teaching of science and ICT. However, the initiators found that the various programmes were disintegrated, unstructured and did not cover all the schools. Thus, at the end of the 1990s Ghana was host to a number of ICT initiatives supported by the government and NGOs. The Ministry of Education in conjunction with the Ghana Education Service (GES) and other partners undertook a critical analysis and review of the utilization of ICTs in education under the auspices of the United Nations Global E-Schools and Community Initiatives (Dadebo , 2003).

Pelgrum (2001) states that using computers could revolutionize an outmoded educational system, better prepare student for the information age and accelerate national development efforts. Cuban (2001) considers computers a vehicle for reforming educational practices, to be used as an instructional tool by teachers at all levels of education. McAllister and Mitchell (2002) add that using computers will make the learning process exciting for both students and teachers. Jonassen (1996) explains this global proliferation by saying that when students use databases, spreadsheets, multimedia, e-mail, and network search engines to complete their projects, such processes provide greater potential to promote cognitive development. Also according to Thomas (2003), computers raise the potential to equip students with higher-order skills such as inquiry, reasoning, problem solving and decision making abilities, critical and creative thinking and learning how to learn. Research also showed that using computers has a positive effect on students achievement compared to traditional methods (Lewis 1995; Christensen & Knezek, 2001)

In the past few years, technology has been an integral part in the reformation of mathematics education (McCoy, 1996). For Social Studies, technology offers a new way to reach out for the world. Many social studies educators have argued that preparing students for the responsibility of the office of a citizen is in fact the perfect place to let students learn to critically explore their world through the use of interactive technologies (Braun & Risinger, 1999; Cogan, Grossman, & Lei, 2000). That is, having access to up-to-date knowledge resources, archives, and experts via information technology can only benefit a teaching field that (a) has begun to recognize the important implications for teaching and learning social studies from a constructivist perspective (Alleman & Brophy, 1998; NCSS, 1994) and (b) stresses the importance of allowing students to develop the intellectual skills necessary to critically unpack primary sources and to work with data sets, while investigating and inquiring into past and present issues (White, 1997).

Much of the Social Studies curriculum is based around the idea of learning about the world around us and the myriad ways that people across the globe function and live differently but effectively. With technology, social studies teachers, have a chance to allow students to explore and experience the world in a new virtual way and create knowledge by themselves and improve upon their academic prowers. This fosters the much emphasized constructivist paradigm.

REVIEW OF LITERATURE

MEANING OF COMPUTER ASSISTED INSTRUCTION (CAI)

Computer Assisted Instruction (CAI) can be referred to as a self-learning technique usually offline or online, involving interaction of students with programmed instructional materials. CAI is an interactive instructional technique whereby a computer is used to present the instructional material and monitor the learning

that takes place. CAI uses a combination of text, graphic sound and video in enhancing the learning process. CAI also bothers on the use of the computer as a tool to facilitate and improve instruction. CAI programs use tutorials, drill and practice, simulation and problem solving approaches to present topics and they best test the students' understanding.

Computer assisted instruction is concerned with the use of computers not only as a choice but to mediate the flow of information in the instruction process and the complementary means (Usun, 2000). CAI was utilized in the education as an educational medium which delivers instructional activities in the late 1950s. Papert (1993) stated that "…programming the computer to administer the kinds of exercises traditionally given by a teacher at blackboard, a textbook, or a worksheet" (p. 5). Although the technology has been changing rapidly over the twenty years, computer-assisted instruction is still utilized in education. Drill-and practice, Tutorial, Games, and Simulation are commonly used CAI applications for educational purposes.

Drill-and-practice programs lead learners through a series of examples to increase dexterity and fluency in a skill. Drill-and-practice is used predominantly for math drills, foreign language translation and vocabulary building. In these programs the student is allowed several tries before the computer presents the correct answer.

Another type of computer application in education is simulating experimentations. In the simulation environment, students investigate simulations on the computer screen as a replacement for observing and doing something real, either in a laboratory or in the field. For instance, one program popular in the early '90s was simulated natural ecosystem. In this ecosystem simulation software, the students could change a number of characteristics of the habitat, the consequences of which were then played out for them to observe and from which they were to draw conclusions (Setzer & Monke, 2001).In social studies, rain and volcanic formation can be simulated to promote procedural knowledge.

In the tutorial mode, computers act as the teacher by presenting information in small units to the students and then reinforcing it with questions or tasks. Then computer analyzes the student's responses and gives feedback or remedial instruction based on his or her response. For example *Mavis Beacon Teaches Typing* is a tutorial program which guides students to learn touch-typing skills (Smaldino, Russell, Heinich, & Molenda, 2005). In computer-assisted tutorial applications that provide student different methods of answering a problem and immediate answers, exploratory software programs allow students opportunities to engage in mathematical investigations, and programming skills that develop logical reasoning in students.

The final mode is games. Smaldino et al. (2005) defines game as "…an activity in which participants follow prescribed rules that differ from those of real life as they strive to attain a challenging goal" (p. 121). Therefore, a game may or may not be instructional. If it contains academic skill practice then it is defined as an educational game. Game software provides elements of competition into learning activities. With computer games, students are competing against their own previous scores or against the designer of the game as they indicate their understanding of educational content. This fosters students' motivation. Game assumes that students have already gained the knowledge of the content and generally it is designed based on the time-limitation to encourage students to respond quickly (Ugwu, 2005). As an example, *King Arthur's Magic Castle* educational game was designed based on the problem solving strategies to emphasize entertainment (Smaldino et al. 2005).

The above modes of CAI are the ones that are widely used in the educational practices. However there are other utilization methods of CAI: such as Discovery and Problems Solving programs. The goal of quality education seems to have the computers as new learning and teaching resource rather than a teacher's aid in the future. With the usefulness of Internet since 1990s, Distance Education, Virtual Reality (VR), Electronic-Books (e-Books), and Electronic Learning (e-Learning) have become the future of learning (Robertson, 2004). The computer has many purposes in the classroom, and it can be utilized to help a student in all areas of the curriculum.

CAI AND ACADEMIC ACHIEVEMENT

The widespread usage of computers by educators to support teaching has been dramatic over the last thirty years. A lot of research have been conducted on the effects of computer use on students' achievement, attitude, and other variables. However, many educational stakeholders still continue to search the evidence on the positive effects of CAI on student learning before implementing the computer technologies into educational settings. There is a large enough data to show the usefulness of educational technologies that, they are capable to improve the students' achievement. Most of the studies of computer use in mathematics education have largely examined clearly pioneering situations, usually linked to development projects of same type. Equally, the focus of these studies has been mainly on student cognition and computer interaction.

The meta-analyses of the 1980s, produced the conclusion that, programs of computer-based instruction have positive evidence in the evaluation literature (Kulik, 1994).

Similarly, Burns and Bozeman (1981) provided the results of a meta-analysis of 40 studies that compared the effectiveness of traditional instruction alone with a combination of traditional instruction and computer-assisted instruction on students' 39 mathematics achievement. Results showed that the combined traditional-CAI approach was significantly more effective. Specifically they drew the following conclusions:

1. A mathematics instruction combined with the CAI was significantly more effective in developing student achievement, than was an instruction only traditional teaching methods with raising arithmetic achievement by .37 standard deviation
2. CAI with drill and practice were significantly more effective in promoting increased student achievement among high achievers and low achievers and in both elementary and secondary graders. Whereas the moderate achievers were effected by the supplementary CAI. (p.37)

Likewise, Hasselbring (1984) summarized results of research studies and meta-analyses on the effects of computer-based instruction on students' achievement and attitudes, where results favor the use of Computer Based Instruction over traditional instruction.

Mevarech and Rich (1985), also conducted a three-year study on the effects of CAI on disadvantaged third, fourth, and fifth grade Israeli students. The study divided the participants into two groups; one group receiving traditional instruction supplemented by CAI and the other receiving traditional instruction only. Results which compared the type of instruction to grade level and gender on the Israeli Ministry of Education's Arithmetic Achievement Test showed that at all three grade levels, CAI students scored significantly higher on arithmetic achievement than students who received traditional instruction only. In a related research, Mokros and Tinker (1987) conducted studies to conclude how middle school students learn graphing skills through microcomputer-based laboratories. Results of the study pointed out that the scores on graphing items were significantly improved in students' ability to interpret and use graphs from pretests to posttests when the microcomputer-based laboratory were used.

In addition, Ganguli (1990) explored the effectiveness of the microcomputer in the form of demonstration tool on the achievement and attitudes. Participants of the study were college students in the intermediate algebra class in which two classes were taught chosen units with teacher-demonstrated microcomputer graphs and two classes were taught the same chosen units with graphs drawn by the teacher on the chalkboard. After completion of five weeks of teaching, a 16-item multiple-choice posttest was conducted; at the end of the quarter, a two-hour comprehensive examination was administered. Results of the study indicated that the treatment effect was significant for the comprehensive examination but not for the posttest.

The results of Cotton's study in the year 1997 (cited in Tran, 2001) was that the use of computer-assisted instruction, as a supplement to traditional, teacher-directed instruction, produces higher achievement compared to those to traditional instruction. Moreover, results were also valid for students of different ages and learning abilities in different subject matters. Randel, Morris, Wetzel, & Whithill (1992) examined 68 studies in their review research conducted before 1984 on the difference between games or simulation and traditional instruction in student performance.. Results revealed that, in seven out of eight studies, use of games in statistics lessons is superior to traditional instruction for improving achievement. Kulik (1994) indicated that use of certain computer based instruction programs raised student achievement at least 1.4 years after 10 months of use.

Barnett (2006), in a study of the effect of Computer Assisted Instruction on the reading skills of emergent readers, students using Destination Reading (Riverdeep, 2001) did not benefit significantly from the use of the program compared to nonusers. The CAI group scored significantly lower on the initial sound fluency measure. Factorial ANOVA were used to compare DIBELS scores for effectiveness of the treatment, pre and post test comparisons and interaction of treatment with test scores for the CAI compared with the nonuser group. Two distributions were used to analyze data from the Reading Running Record and

Word Recognition assessments. There were no significant differences between the CAI and comparison schools on these two measures. Teacher attitude toward computer did not affect students' acquisitions of reading skills, as survey responses were in the positive range for all participants.

Kulik (2003), a researcher at the University of Michigan, reviewed the evaluation studies in elementary and secondary levels published during 1990s. His research integrated the findings in 61 controlled evaluation studies in six areas: (a) integrated learning systems; (b) reading management systems; (c) writing programs for teaching reading; (d) word processing and Internet resources; (e) microcomputer based laboratories; and (f) science tutoring and simulations. Only 16 studies are reviewed for conclusions about the effectiveness of CAI using integrated learning systems (ILSs) on reading and mathematics achievement of elementary and secondary grade students. Seven of those studies examined mathematics learning alone whereas the remaining nine studies examined effects in both mathematics and reading. Kulik found ILS was at least as effective as traditional instruction. Effect sizes were changes between 0.14 and 1.05.

In Social Studies, Adeyemi (2012) found that students who used Computer Assisted Instruction did not perform better in Social Studies achievement than those students taught with conventional method. Furthermore, this study found that there was no significant interaction effect of treatment on students' academic ability and their achievement in Social Studies. This implies that treatment (Computer Assisted Instruction and Conventional Methods) are not sensitive to students' achievement in Social Studies.

Since Social studies is an integration of Geography, Economics, History etc., it is imperative to find out the effect of CAI on some of these integrated subjects. For instance, Egunjobi (2002) in geography teaching confirmed that CAI seem to be effective in enhancing students' performance in other subjects than the conventional classroom instruction, a finding opposed to that of Adeyemi (2012). George P. L. and Barry J. Fraser (1994), in a study of CAI in Geography teaching, found that, in contrast to past research, the use of CAI led to a large impact in terms of achievement (effect size of 3.5 standard deviations), attitudes (1.4 standard deviations) and classroom environment (ranging from 1.0 to 1.9 standard deviations). The large effect sizes arising from this study could be attributed to the peculiar situation inherent in the Singapore education system. That is, the highly meritocratic, technologically-biased, centrally-controlled and achievement-oriented system might produce students who perform well. The large effect sizes seem to suggest that appropriate computer-based teaching can be effective with slow learners (ie., the Normal students), a finding which is consistent with the meta-analysis of CAL effectiveness reviewed by Kulik & Kulik (1991).

Looking at gender of students' performance at secondary school level Ash (2005), Basturk (2005) and Dantala (2006) found no significant difference between male and female students taught history using computer-assisted instructional package. However, Collier (2004) described that instruction supplemented by properly designed Computer-Assisted Instruction is more effective than instruction without Computer-Assisted Instruction. This was confirmed by Bergman and Cheney (1996) who found Computer-Assisted Instruction increased learner knowledge when it involves the synergy of multiple senses. Learners were found to retain new knowledge better when the curriculum was presented with a combination of formats of text, sound, graphics and video.

Similarly, Haley (1991) experimented Computer-Assisted Instruction in Macroeconomics Education. Results of the regression analysis showed no significant positive relationship between students' cognitive achievement in Principles of Macroeconomics and their use of computer-assisted instruction. The only independent variable that was consistently positively related to students' cognitive achievement in Principles of Macroeconomics was college grade point average. Males were shown to be superior to females in terms of cognitive achievement in macroeconomics.

Ehman and Glenn (1987) provide a most useful and timely review of the research literature concerning the effects of computer use in K-12 Social Studies. In general, research that focuses explicitly on computers in social studies has proceeded very slowly. In fact, Ehman and Glenn note that much of what they report is highly impressionistic, based on limited or non-existent empirical evidence. Across curriculum areas, researchers have found drill and tutorial programs to be moderately effective in producing cognitive gains at all grade levels, but especially at the elementary level of schooling (Niemiec and Walberg 1987). With respect to drills and tutorials in social studies, the picture is sketchy at best. Ehman and Glenn (1987) characterized the available research findings as "scattered and mixed" with respect to drill programs, tending somewhat to show a small impact on affective and lower-level cognitive outcomes. Studies involving tutorial programs linked to videodisc (Glenn, Kozen, and Pollak 1984) revealed positive effects on knowledge acquisition and application. Overall, much more research is needed to obtain a clearer picture of drill and tutorial effects in social studies.

Early research appeared to confirm the instructional effectiveness of computer-based simulations across all subject areas. Later meta-analyses of simulation research contradicted this view (Bangert-Drowns et al. 1985), finding little support for cognitive gains attributable to simulation use. For social studies simulations, the Ehman and Glenn (1987) review of the literature pointed to positive affective outcomes and gains in cooperative learning capabilities of students.

The literature reviewed suggests a positive impact of CAI on academic achievement and favours its usage in the teaching and learning process. However, the above literature indicates that, there is a limited empirical literature on the effects of CAI in social studies education. Among all of the above studies, only few focused on social studies. Little evidence derived from rigorous studies supports the kinds of intellectual outcomes often associated with CAI use in Social Studies, but anecdotal reports of such outcomes (Roessler 1987) suggest that further research is warranted. This reveals the importance and need of the present study to unravel the efficacy of CAI on the performance of students in social studies.

STATEMENT OF THE PROBLEM

There is no doubt that, ICT has become a driving force of educational reforms and it is an integral part of national education polices and plans. During the last decade, the Ghana Government in collaboration with the Ghana Education Service has invested heavily in information and communication technology (ICT). ICT has had a major impact in educational context, in organization and in teaching and learning methods. During the 1980s, computer-assisted instruction (CAI) was an important part of classroom computer use. Teachers, department chairs, and district technology coordinators purchased commercial and public domain programs in the subject areas, stored on one or more floppy disks, including drill and practice programs, tutorials, simulations and games. During the next decade there were four major changes that improved CAI: the decline in the use of floppy disks, replaced by the enhanced storage capability of CD-ROM and video disc; enhanced interactivity in software in which students play a more active role; sophisticated graphics, video clips, color and sound, creating a multimedia presentation no longer dominated by screens of text; and the growing marriage of CAI and telecommunications, allowing a seamless transition from single-computer use to collaborative work with distant partners and access to Internet-based resources.

The use of CAI in the social studies classroom continues to be strong, although such use is being eclipsed by the tool uses of computers: word processing, communications, research, and multimedia production. CAI has greatly improved in creativity and quality; many programs offer motivating experiences for students in analysis, problem solving and decision making. Recent developments have created new opportunities for powerful social studies teaching assisted by technology and major improvements have taken place in both hardware and software. Computers are much more powerful and versatile than they were a decade ago and although many educational programs at that time were oriented toward drill and practice, it is now easy to find interactive and engaging programs. Using the right combination of hardware and software, teachers can develop lessons that enhance student skills in information retrieval, the presentation of data, the comparison and evaluation of different perspectives, and critical reflection and decision making.

Social studies, having been taught the traditional way for years, it is envisaged that the use of ICT in social studies can promote teaching and learning and further improve students' achievement. This research therefore, aims at looking at how the use of computer assisted instruction (CAI) in the teaching and learning of social studies has had an effect on students' academic performance.

PURPOSE OF THE STUDY

This research aims at looking at how the use of Computer- Assisted Instruction (CAI) in the teaching and learning of social studies can improve students' performance. Specifically, the study examined whether computer-assisted instruction will raise the performance of students in the learning of social studies as compared to traditional method.

OBJECTIVES OF THE STUDY

Based upon the purpose, the objectives of the study were to:

1. Find out the potential impact of Computer Assisted Instructions on the teaching of social studies in the Senior High School.
2. Examine the impact of the traditional method of instruction on the performance of students in social studies in Senior High Schools.
3. Compare the performance of students with respect to computer-assisted instruction and the traditional method.

HYPOTHESES

1. Ho: There is no statistically significant difference in the pretest scores of the control group and the experimental group.
2. Ho: There is no statistically significant difference in performance between the control group exposed to the traditional method of teaching and the experimental group exposed to CAI.
3. Ho: There is no statistically significant difference in the pretest scores and posttest scores of the control group.
4. Ho: There is no statistically significant difference in the pretest scores and posttest scores of the experimental group.

RESEARCH METHODOLOGY

This research used the true experimental design (pretest-posttest) on a sample population of 40 students from the Bawku Senior High School. Traditional teaching method and Social Studies tutorial software were used as instruments to collect assessment data and a t-test used as a statistical tool for data analysis.

ANALYSIS AND DISCUSSION OF RESULTS

HYPOTHESIS 1

Ho: There is no statistically significant difference in the pretest scores of the control group and the experimental group.

The two groups involved in the study were given a pretest to assess how similar in ability the students in each of the groups were. The result of the independent sample t-test is presented in Table 1.

TABLE 1: INDEPENDENT SAMPLE T-TEST FOR THE PRETEST

	Group	Mean	Mean Difference	Std.Deviation	t-value	sig (2-tailed)
Control	6.65		2.681			
		.000		. 000	1.000	
Experimental	6.65		2.870			

Significant p< 0.05

Source- Field Data 2011

To test the hypothesis, the independent sample t- test was performed comparing the mean score for the control group (M = 6.65, SD = 2.681) with that of the experimental group (M = 6.65, SD = 2.870). With alpha set at .05, the test was shown to be not statistically significant, t (38) = 1.000, p > .05. Based on the result the null hypothesis is therefore, accepted, that is, there is no significant difference in the pretest scores of the control group and the experimental group.

POSTTEST

After both classes received four weeks of instruction in a unit in social studies, the classes were administered a posttest. The posttest was designed to evaluate the progress made after introducing the interventions and to compare the results of the instruction received by both groups.

HYPOTHESIS 2

Ho: There is no statistically significant difference in performance between the control group exposed to the traditional method of teaching and the experimental group exposed to computer–assisted instruction.

The hypothesis was designed to ascertain whether the use of computer- assisted instruction (CAI) in the teaching and learning of social studies can improve students' performance as compared to the traditional classroom method. The result is depicted in Table 2.

TABLE 2: INDEPENDENT SAMPLES T-TEST FOR POSTTEST

Group	Mean	Mean Difference	Std.Deviation	t-value	sig (2-tailed)
Control	14.20		2.353		
		-4.600		-7.913	000
Experimental	18.80		1.105		

Significant p< 0.05

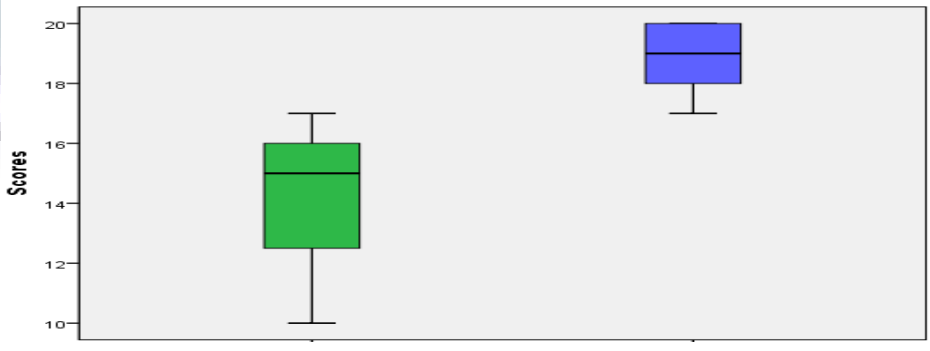
Source- Field Data 2011

To test the hypothesis, the independent sample t- test was performed comparing the mean score for the control group (M = 14.20, SD = 2.353) with that of the experimental group (M = 18.80, SD = 1.105) with alpha set at 0.05, the test was shown to be statistically significant, t (38) = 000, p < 0.05. The results of the t-test shown in Table 2 indicate that, there is a significant difference between the posttest score of the control group and that of the experimental group.

The effect size for the difference was calculated using Cohen's (1988) criteria for determining effect size. The effect size for this analysis (*d* = .87) was large as it was found to exceed Cohen's (1988) convention for a large effect (*d* = .80).

This is further illustrated in Figure 1 for quick and pictorial presentation.

FIGURE 1: BOX PLOT SHOWING THE MEDIAN AND INTER-QUARTILE RANGES OF BAWKU SHS (POSTTEST)



Control group Experimental group

Figure 1, illustrates the median and the inter-quartile ranges of the raw scores of students from the two groups in the study. As depicted in figure 1, the experimental group had median value of 19 with lower and upper quartile value of 18 & 20 respectively, with the control group having median value of 15, lower and upper quartile value of 12 and 16 respectively. This confirms that the experimental group did better in the posttest as compared to the control group. Collier (2004) found that instruction supplemented by properly designed Computer-Assisted Instruction is more effective than instruction without Computer-Assisted Instruction. This contradicts findings by Adeyemi (2012) , who found that students who used Computer Assisted Instruction did not perform better in Social Studies achievement than those students taught with conventional method. A further disagreement was that there was no significant interaction effect of treatment on students' academic ability and their achievement in Social Studies. However, the finding in this study was confirmed by Bergman and Cheney (1996) who found Computer-Assisted Instruction to increase learner knowledge when it involves the synergy of multiple senses. Learners were found to retain new knowledge better when the curriculum was presented with a combination of formats of text, sound, graphics and video. Furthermore, Egunjobi (2002) in Geography Education, confirmed the findings in this study that CAI seem to be effective in enhancing students' performance in other subjects than the conventional classroom instruction.

HYPOTHESIS 3

Ho: There is no statistically significant difference in the pretest scores and posttest scores of the control group. To test the hypothesis, the independent sample t- test was performed comparing the mean score for the pretest and post test of the control group. The results of the t-test showed in Table 3.

TABLE 3: INDEPENDENT SAMPLES T-TEST ON GROUP MEAN SCORES FOR THE CONTROL GROUP PRETEST AND POSTTEST

Group	Mean	Mean Difference	Std.Deviation	t-value	sig (2-tailed)
Pretest	6.65		2.270		
		-7.550		-9.427	000
Posttest	14.20		2.353		

Significant p< 0.05

Source- Field Data 2011

Table 3 shows that there is a significant difference between the posttest score and that of the pretest of the control group. Thus pretest (M = 6.65 SD = 2.270) and posttest (M = 14.20, SD = 2.353) with alpha set at 0.05, the test was shown to be statistically significant, t (38) = 000, p < 0.05. The mean score for the post test was higher and significant than the mean score for the pretest. This may be as a result of improved method in teaching or, the introduction of appropriate teaching and learning materials.

HYPOTHESIS 4

Ho: There is no statistically significant difference in the pretest scores and posttest scores of the experimental group. To test the hypothesis, the independent sample t- test was performed comparing the mean score for the pretest results (M = 6.65, SD = 2.270) with that of the posttest results (M = 18.80, SD = 1.105) with alpha set at 0.05, the test was shown to be statistically significant, t (38) = 000, p < 0.05. The results of the t-test is showed in Table 4.

TABLE 4: INDEPENDENT SAMPLES T-TEST ON GROUP MEAN SCORES FOR THE EXPERIMENTAL GROUP PRETEST AND POSTTEST RESULTS

Group	Mean	Mean Difference	Std.Deviation	t-value	sig (2-tailed)
Pretest	6.65		2.353		
		-12.150		-17.666	000
Posttest	18.80		1.105		

Significant p< 0.05

Source- Field Data 2011

From Table 3 and 4 it is observed that, there was statistically significant difference in the performance after the treatment for both groups; however it was much greater with the experimental group who were exposed to Computer-Assisted Instruction than the Control group who were exposed to the traditional method of teaching with a mean difference of 12.15 and 7.55 respectively. This is an indication that students exposed to Computer-Assisted Instruction performed better than those exposed to the traditional method of teaching. This confirms the assertion of Collier (2004) that instruction supplemented by properly designed Computer-Assisted Instruction is more effective than traditional method of instruction. Furthermore, the results indicates that the same students who were exposed to the different forms of learning (CAI and traditional) produced varied results. The posttest results obtained by the same experimental group was higher than their pretest results and the variation was highly significant. This means that the same group performed better learning with CAI than the 'chalk and talk'. The above results confirms findings of George & Fraser (1994), in a study of CAI in Geography teaching, that, in contrast to past research, the use of CAI led to a large impact in terms of achievement (effect size of 3.5 standard deviations), attitudes (1.4 standard deviations) and classroom environment (ranging from 1.0 to 1.9 standard deviations). The large effect sizes was attributed to the peculiar technologically-biased, centrally-controlled and achievement-oriented system which produce students who perform well. The large effect sizes seem to suggest that appropriate computer-based teaching can be effective with learners (ie. the Normal students), a finding which is consistent with the meta-analysis of CAL effectiveness reviewed by Kulik & Kulik (1991). This was confirmed by Bergman and Cheney (1996) who found Computer-Assisted Instruction increased learner knowledge when it involves the synergy of multiple senses. Learners were found to retain new knowledge better when the curriculum was presented with a combination of formats of text, sound, graphics and video.

Traynor (2003) stated that computers are used not only as a means of helping schools analyze data, but computers have also become a pervasive tool toward optimizing student learning. The computer assisted instruction module may enable students to process information at their own pace which is usually rigidly controlled by the instructor in a traditional objectivist learning environment, hence making the leaning process more individually tailored and achievement oriented.

SUMMARY OF FINDINGS

The major findings of the study are as follows:

1. The study found no significant difference in the pretest scores of the control and the experimental groups who were all taught using traditional method.
2. The study found that there was significant difference in the mean scores of students who were exposed to the Computer-Assisted Instruction and those who were exposed to the traditional method of teaching. The result showed that the experimental group performed better than those exposed to the traditional method of teaching.
3. The study further found that there was statistically significant difference in the performance after the treatment for both groups; however it was much greater with the experimental group who were exposed to Computer-Assisted Instruction than the Control group who were exposed to the traditional method of teaching. This is an indication that students exposed to Computer-Assisted Instruction perform better than those exposed to the traditional method of teaching

RECOMMENDATIONS

In the light of the findings of the study, the following recommendations have been made:

1. Ghana Education Service should organize training for teachers on how to use ICT applications in the delivery of lessons at all levels of the educational ladder and in Senior High schools in particular.
2. Teachers in social studies should incorporate the skills learned in ICT into their lessons delivery as that will motivate students to learn better.

3. All schools with computer laboratories should as much as possible not use it for only information and communication technology lessons. Teachers of other subjects should be encouraged to use them for their lessons.
4. Since the use of computer assisted instruction requires students to be conversant with the use of computers, the one laptop per child proposed by the Government of Ghana should be encouraged to come to reality soon.
5. The government and the policy implementers such as Ghana Education Service should put priority on ICT education at all levels of the educational ladder especially at the basic level so that students will be abreast of the use of computers at the early stages.
6. There is the need for the government and all the stakeholders to help develop relevant computer-assisted instruction packages for teaching social studies as well as all other subjects in Senior High Schools in Ghana.

CONCLUSIONS

On the basis of the findings of the study the following conclusions are drawn:

1. The introduction of computer assisted instruction in Social Studies is likely to improve the quality of teaching and learning and promote high academic achievement.
2. Students like learning through concrete materials such as computer assisted instruction medium, which arouse their interest and get them more actively involved in Social Studies lessons.
3. Learning Social Studies through CAI will make the subject matter real and understandable to students which will later reflect positively in their academic performance.

SCOPE FOR FURTHER STUDY

In view of the findings of this study, it is suggested that the following areas should be inquired into:

1. The effect of CAI on students' performance in Social Studies with respect to gender.
2. The effect of using CAI together with teacher guided instruction on students' performance.

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