STUDENTS’ PERCEPTION TOWARDS THE USE OF COMPUTER-ASSISTED INSTRUCTION FOR LEARNING MATHEMATICS IN MINNA, NIGER STATE, NIGERIA

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Abstract  
The potentials of Computer-Assisted Instruction (CAI) in enhancing teaching and students’ achievements have been highlighted in several studies. Similarly, lack of infrastructures, ICT facilities, manpower and digital divide between the developed and developing nations had been a serious problem towards integration of CAI into educational system. This study examined students’ perception towards the use of CAI for learning mathematics in Minna, Niger State, Nigeria. Gender influence on their perception was also examined. Participants were 540 students (270 male and 270 male) from six secondary schools in Minna, Nigeria. The data were collected through questionnaire and analyzed using percentage, mean, t-test and ANOVA statistics. Findings revealed that majority of the students have positive perception towards the use of CAI. No significant difference among students’ perception towards the use of CAI for learning mathematics based on school type. Similarly No significant difference was established based on gender. The implication is that the student perceived the use of CAI as a mean of improving their performance in mathematics, therefore, it was recommended among others that adequate ICT infrastructure should be provided with relevant mathematics CAI packages in Nigerian schools.

Keywords: ICT, Computer-Assisted Instruction, Mathematics, Learning, Perception.

Introduction  
The importance of mathematics in the development of any society cannot be over stressed. Mathematics is the backbone of knowledge (Okafor, 2002). Mathematics is also described as the pivot of all civilizations and technological development (Azuka, 2001). These descriptions point out the significant position accorded mathematics as a key factor in the development of any nation. When properly viewed, mathematics is a model for thinking, developing scientific structure, drawing conclusions as well as for solving problems (Mwei, Too, & Wando, 2011). The above comments stress the fact that mathematics is not only a valuable subject, but also a vital tool in science, commerce and technology. Mathematics, the science of quantity and space, occupies a key position in Nigeria’s education system reflecting accurately the vital role the subject plays in contemporary society. It is in realization of this that many countries now resort to making special comprehensive and well-programmed efforts towards the effective teaching and learning of science and mathematics at all levels of the educational system.
through the development and implementation of innovative programs and projects (Azuka, 2001). Okafor (2002) noted that mathematics is a compulsory subject for entry requirement into university education. Pass at credit level in mathematics is expected to qualify an individual for further study.

In spite of its importance to nation building, students’ poor performance in the subject has been traced to teacher-centred approach used by mathematics teachers, lack of active participation in the teaching and learning process, overcrowded classes, lack of instructional materials and many others. Persistent use of teacher-centred approach make students become passive and have less interaction with one another in performing some tasks, develop negative attitude towards mathematics which eventually led to poor performance in the subject (Gambari & Adegbenro, 2008; Ojo, 2002). Zakaria, Chin and Daud (2010) concluded that positive changes take place when a teacher changes his teaching method towards a more students-centered approach. Sule (2003) reported the effectiveness of technology such as computer for enhancing teaching and learning of mathematics.

The potential benefits of Computer Assisted Instruction (CAI) cannot be underestimated in the contemporary world. There is a plethora of established findings on the instructional value of computer, particularly in advanced countries. There are now several CAI packages on different subjects. It is obvious that the current trend in research all over the world is the use of computer facilities and resources to enhance students' learning (Yusuf & Afolabi, 2010). This may be the reason why Handelsman, Ebert-May, Beichner, Bruns, Chang, et al (2004) opined that “many exercises that depart from traditional method are now readily accessible on the web” (p. 521), even though teachers do not use these facilities. They further showed that the interactive approaches to lecturing significantly enhance learning.

Computer has been found to be the most suitable, reliable and versatile medium for individualizing instruction. It is able to deal simultaneously with large number of students on individual basis and this tends to lower the cost, in the long run (Yuen & Ma, 2002). With the advent of computer-based learning, instructions are shifting from traditional methods of instruction to computerized methods of instruction in developed nations.

Nigeria Government appreciate these facts, in 1998, the Federal Government of Nigeria launched the National Policy on Computer Literacy at primary, secondary and tertiary levels of education (FRN, 1988). As at year 2000, nine ICT for education initiatives at various stages of development was established. These are being carried out by the education coordinating agencies of government and the Federal Ministry of Education. Computer science was also incorporated into secondary school curriculum. Non-governmental organization such Parent Teachers Association (PTA), SchoolNet Programme and many others had donated computers with internet facilities, Uninterrupted Power Supply (UPS), and standby generator to some selected public schools in Nigeria. Studies have revealed that there is a wide gap between policy development and implementation in the Nigerian schools as regards computer education in Nigerian schools (Jegede & Owolabi, 2003).
In Nigerian schools, computers are used not only as a means of helping schools for analyzing data, it is also a pervasive tool toward optimizing student learning. For example, students are regularly using the Internet to gather and assimilate information for use in research assignments. They are preparing "electronic" presentations using computer presentation programs and LCD projectors. They are using word processing programs to create various other reports. Students are even using spreadsheets to increase their experiences with mathematical concepts. In addition, many schools have incorporated interactive computer-assisted-instruction into their program to provide students opportunities to master specific educational objectives or standards (Oyelekan & Olorundare, 2009; Patrick, 2003). Part of this study is to investigate students’ perception towards the use of computer for learning.

Yusuf (2005) noted that the full potential of computers is yet to be exploited within the Nigerian school system. Successful implementation of computer education can only be assured through teachers who have acquired necessary knowledge and skills. If computer education is to succeed in Nigerian schools, teachers must be competent in the use of computers. Sufficient computer literacy in students is a necessary condition for successful autonomous learning in a CAI environment (Reed, Drijvers and Kirschner 2010). Yusuf and Balogun (2011) reported that majority of the student-teachers have positive attitude towards the use of ICT and they are competent in the use of few basic ICT tools. Overall, no significant difference was established between male and female student-teachers’ attitudes and use of ICT.

CAI brings with it several potential benefits as a teaching/learning medium. These include self-paced learning, self-directed learning, the exercising of various senses and the ability to represent content in a variety of media. With self-paced learning, learners can move as slowly or as quickly as they like through a program. If they want to repeat some task or review some material again, they can do so as many times as they choose. The program will not tire or complain about repetitions. Learners can skip over a topic if information is already known, making the learning process more efficient. With self-directed learning, learners can decide what they want to learn and in what order (Gambari, 2010). CAI software teaches specific skills and knowledge, often narrowed to a specific content area and grade range. This type of software is in contrast to tool software that can be used in general to help students through problem processing at any grade level and in any content area, such as: word processors, newsletter programs, spreadsheets, databases, audio-video editors, or presentation programs.

ICT has taken advantage of computer algebraic system to allow students and teachers access to various topics in mathematics. Similarly, computer animation can make mathematics more interesting and stimulating that students want to learn more. Computer can be used to explain certain mathematical concepts in calculus, vectors, orthogonal polynomials, numerical approximations. Fourier series and Laplace Transforms, are topics that can be introduced in a motivated way using computer animation. It is obvious that the Computer-Assisted Instruction exerts a tremendous influence in reshaping and transforming the ways mathematics is taught and learned. Yusuf and Balogun (2011) reported that majority of the student-teachers have positive attitude towards the use of ICT and they are competent in the use of few basic ICT
tools. Mwei, Too, and Wando (2011) reported higher achievement and positive attitudes with those students taught mathematics using computer. CAI offers a valuable means for improving mathematical knowledge and skills and hence performance in Mathematics. Also, Anyamene, Nwokolo, Anyachebelu and Anemelu (2012) reported that students taught mathematics using (CAI) package performed significantly better than their counterparts taught using the conventional method of instruction. In another study, Reed, Drijvers and Kirschner (2010) revealed that using computer as a mathematical tool enhanced positive attitudes towards mathematics and augmented their learning behaviours.

Gender is one of the factors affecting students’ performance in mathematics at senior secondary schools. Anekwe (2006) stated that one of the reasons male students perform better than female students in mathematics is that more attention is given to male students than the female students. He also recommended that equal attention should be given to both male and female students. Derbyshire (2003) conducted a study in four African countries identified that while in principles girls are given the same opportunity as boys of access to computer, gender equity does not exist in practice. Studies had established that females tend to be less interested in computer and use them less often in their spare time (Schaumburg, 2001). Female also have more negative attitude towards computer (Bebetsos & Antoniou, 2008), thus they are often less computer literate than males (Kadel, 2005; Schaumburg, 2001; Townsend, 1997), thus they are often less computer literate than males (Schaumburg, 2001) and this may result in different ways of using the computer (Jackson, Ervin, Gardner, & Schmitt, 2001). Yusuf and Balogun (2011) found no significant difference was established between male and female student-teachers’ attitudes and use of ICT.

Based on the aforementioned review, it’s obvious that the effectiveness and efficient use of these CAI packages has not been felt. Schools have been equipped with computers mostly by non-governmental organization such as the SchoolNet programme. Computer-Assisted Instructional packages were developed by various programmers and software developers for various subjects and used in private schools while many public schools have no electricity talkless of computer. Most studies that examined effectiveness of CAI on students’ performance were conducted outside Nigeria; in fact, studies on students’ perception towards the use of CAI for teaching mathematics are unknown. Therefore, gaining an appreciation of students’ perception toward the use of CAI may provide useful insight into the future of technology integration, acceptance and usage in teaching and learning in Nigerian secondary education institutions and other developing countries. Thus, this study investigates the use of Computer-Assisted Instruction Package on learning mathematics among senior secondary school students in Minna, Niger State.

**Purpose of the Study**
The purpose of this study was to investigate the perception of mathematics students towards the use of Computer-Assisted Instruction packages for learning mathematics. The specific objectives of the study are to:
(i) Determine the students' perception towards the use of Computer-Assisted Instruction in learning mathematics base on school type.

(ii) Examine the difference between male and female students’ perception towards the use of Computer-Assisted Instruction in learning mathematics.

Research Questions
(i) Is there any difference in the perception of secondary school students' towards the use of Computer-Assisted Instruction in learning mathematics?
(ii) What are the differences among secondary students' perception towards the use of Computer-Assisted Instruction in learning mathematics based on school type?
(iii) Is there any difference between male and female students’ perception towards the use of Computer-Assisted Instruction in learning mathematics.

Research Hypotheses
(i) There is no significant difference among senior secondary students' perception towards the use of Computer Assisted Instruction in learning mathematics based on school type.
(ii) There is no significant difference between male and female students' perception towards the use of Computer Assisted Instruction in learning mathematics.

Methodology
Research Type
Survey research type was adopted for the study. According to George (2004) survey design is the study of a group of people, collecting and analyzing data from a few people considered to be representatives of the entire group. The design was therefore appropriate for the study since it was to solicit information from senior secondary school students on their perception towards the use of computer-assisted instruction for learning mathematics.

Participants
The population of this study was made up of all senior secondary school mathematics students in Minna, Niger State. Purposive sampling technique was used to select eight co-educational secondary schools from Minna metropolis, Niger State, Nigeria based on the following criteria: equivalence (laboratories, facilities and manpower), school ownership (public and private schools), ICT facilities (computer laboratories under the SchoolNet programme), and candidates' enrolment (Senior Secondary School Certificate in Education in physics for a minimum of ten years). The student-teachers were stratified into male and female. The distribution of sample along the variables is as shown in Table 1.
From Table 1, six senior secondary schools comprised of 540 students, 90 from each school (45 male and 45 female). Two private schools (owned by individual), two public schools (owned by Niger State government) and two unity schools (owned by Federal Government of Nigeria) participated in the study.

Research Instrument

The survey instrument used for this research was developed by the researchers based on established procedures in literature. The survey instrument contained four sections. Section A includes three questions and it focused on demographic information of student: School, Class, and gender. Section B focused on students’ perception towards Computer-Assisted Instruction (CAI). The section contained 25 items and the Likert response mode of Strongly Agree (SA coded as 4), Agree (A coded as 3), Disagree (D coded as 2) and Strongly Disagree (SD coded as 1) were used.

To test the instrument’s validity and reliability, the initial draft was distributed to mathematics, computer and educational technology specialists for face and content validation. Similarly, the draft was administered on 60 students drawn from three selected senior secondary schools (private, public and unity schools) within the population (Niger State). The feedback obtained from specialists and first administration was used to revise the final instrument. The final instrument was tested for reliability using test-retest method of four weeks interval. The reliability coefficients obtained for the instruments was 0.79 using Pearson Product Moment Correlation. Six hundred copies of the questionnaire were distributed to randomly selected students before lecture periods. The questionnaire was administered on the sample during the second semester of the 2009/2010 academic session. On average, students took about fifteen (15) minutes to complete the questionnaire. No questionnaire mortality was recorded (200% return rate) but 60 of it were discarded due to incomplete data, thus were found unusable, at a unusable rate of 90%.

The responses for the respondents were tabulated and compared, and descriptive analysis (percentages and means) were done to present the details about the students’ perception. Also, inferential statistic using t-test, one-way ANOVA, and Scheffe’s post-hoc test were used in analyzing the data obtained from questionnaire. Hypotheses were tested at 0.05 significant level.

<table>
<thead>
<tr>
<th>S/N</th>
<th>School</th>
<th>School Type</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Abu-Turab Islamic College Minna</td>
<td>Private</td>
<td>45</td>
<td>45</td>
<td>90</td>
</tr>
<tr>
<td>2</td>
<td>Fema Schools Minna</td>
<td>Private</td>
<td>45</td>
<td>45</td>
<td>90</td>
</tr>
<tr>
<td>3</td>
<td>Maryam Babangida Science Girls College, Minna</td>
<td>Public</td>
<td>90</td>
<td>-</td>
<td>90</td>
</tr>
<tr>
<td>4</td>
<td>Government Secondary School, Minna</td>
<td>Public</td>
<td>-</td>
<td>90</td>
<td>90</td>
</tr>
<tr>
<td>5</td>
<td>Federal Government College Minna</td>
<td>Unity</td>
<td>45</td>
<td>45</td>
<td>90</td>
</tr>
<tr>
<td>6</td>
<td>Police Secondary School, Minna</td>
<td>Unity</td>
<td>45</td>
<td>45</td>
<td>90</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>270</strong></td>
<td><strong>270</strong></td>
<td><strong>540</strong></td>
</tr>
</tbody>
</table>
Results

The item mean (X) and the criterion means (2.50) were computed and utilized to measure the level of agreement and or disagreement. The decision adopted was that if the item means (X) is greater than criterion mean (2.50), the option is positively rated (agree); if otherwise, the option is rated negatively (Disagree).

Research Question

Is there any difference in the perception of senior secondary students’ on the use of Computer-Assisted Instructional package in learning Mathematics?

Table 2: Number and percentage of secondary school students’ perception on the use of computer-assisted instruction for learning mathematics

<table>
<thead>
<tr>
<th>S/ N</th>
<th>Statement</th>
<th>SD</th>
<th>D</th>
<th>A</th>
<th>SA</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I enjoy using computer to solve mathematical problems</td>
<td>62</td>
<td>122</td>
<td>231</td>
<td>125</td>
<td>2.76</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(11.48%)</td>
<td>(22.59%)</td>
<td>(42.78%)</td>
<td>(23.15%)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Using computer to solve mathematical problems gives immediate feedback.</td>
<td>25</td>
<td>71</td>
<td>233</td>
<td>211</td>
<td>3.13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4.63%)</td>
<td>(13.15%)</td>
<td>(43.15%)</td>
<td>(39.07%)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>I learn faster when I use computer to solve mathematical problems</td>
<td>89</td>
<td>151</td>
<td>173</td>
<td>127</td>
<td>2.52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(16.48%)</td>
<td>(27.96%)</td>
<td>(32.04%)</td>
<td>(23.52%)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>The using of computer to solve mathematical equations can be enjoyable and stimulating</td>
<td>54</td>
<td>78</td>
<td>255</td>
<td>153</td>
<td>2.87</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(10.00%)</td>
<td>(14.44%)</td>
<td>(41.67%)</td>
<td>(28.33%)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>With computer, it is possible to draw various types of Charts</td>
<td>17</td>
<td>46</td>
<td>237</td>
<td>241</td>
<td>3.29</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3.15%)</td>
<td>(8.52%)</td>
<td>(43.89%)</td>
<td>(44.63%)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Computers can help to learn some difficult concepts more easily</td>
<td>35</td>
<td>60</td>
<td>222</td>
<td>233</td>
<td>3.20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(6.48%)</td>
<td>(11.11%)</td>
<td>(41.11%)</td>
<td>(41.40%)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Knowing how to use computers is a worthwhile skill for mathematics students</td>
<td>47</td>
<td>91</td>
<td>235</td>
<td>167</td>
<td>2.97</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(8.70%)</td>
<td>(16.85%)</td>
<td>(43.52%)</td>
<td>(30.93%)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Computer can be exciting when used to solve mathematical problems among the group members.</td>
<td>55</td>
<td>105</td>
<td>243</td>
<td>137</td>
<td>2.90</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(10.19%)</td>
<td>(19.44%)</td>
<td>(45.00%)</td>
<td>(25.37%)</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>I can learn mathematics better from textbooks than from computers</td>
<td>86</td>
<td>104</td>
<td>155</td>
<td>195</td>
<td>2.26</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(15.93%)</td>
<td>(19.26%)</td>
<td>(28.70%)</td>
<td>(39.11%)</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>It takes a long time to finish when I use a computer to solve mathematics problems</td>
<td>191</td>
<td>171</td>
<td>101</td>
<td>77</td>
<td>2.94</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(35.37%)</td>
<td>(31.67%)</td>
<td>(18.70%)</td>
<td>(14.26%)</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>One can learn mathematics using computer without the help of teacher</td>
<td>17</td>
<td>145</td>
<td>146</td>
<td>77</td>
<td>2.24</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3.15%)</td>
<td>(26.85%)</td>
<td>(27.04%)</td>
<td>(14.26%)</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Using computer to learn mathematics will improve my</td>
<td>93</td>
<td>126</td>
<td>183</td>
<td>138</td>
<td>2.56</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(17.22%)</td>
<td>(23.33%)</td>
<td>(23.89%)</td>
<td>(25.56%)</td>
<td></td>
</tr>
</tbody>
</table>
13 Using computer to solve mathematical problem makes me nervous.

14 Computers are difficult to use

15 I have a lot of self confidence when it comes to working with computers

16 Computers can be used successfully with subjects which demand creative activities

17 Learning about computer is not boring to me

18 Using computer to solve problem in mathematics reduce time spent on tasks

19 Working with computers means working on your own, without contacting/getting help others

20 I would never take a job where I had to work with computers

21 I like using computer because it can accommodate different learning styles

22 Students work harder at their assignment when they use computers.

23 All students should have an opportunity to learn about computer at school

24 The computer has calculator and other accessories are embedded, hence making it a useful tool for mathematics

25 When there is a problem in mathematics that I can't immediately solve using computer, I stick with it until I have the answer to it.

Based on the results in Table 2, there is every indication that responses to the positive statements (items 1-8, 12, 15 -16, & 21-25) show that over 50% of the respondents have positive perceptions towards using CAI for learning mathematics. It shows that more respondents believe that CAI could generally provide better learning experience. Students affirmed that it is possible to draw various types of charts with computer. Also, computer can help to learn some difficult concepts more easily, it can accommodate different learning styles,
it is not difficult to use, learning about computer is not boring to me, it reduces time spend on tasks. Similarly, students’ perceived that they should have more opportunity to learn about computer at school, and that accessories embedded in computer makes it a useful tool for mathematics.

However, negative statements (items 9, 11, 13 and 19) show that more than 50% of the respondents disagree or strongly disagree that they learn mathematics better from textbooks than from computers while 56% agree that using computer to solve mathematical problem makes them nervous, 51% perceived that working with computers means working on your own, without contacting/getting help others. Over 53% of the respondent disagree that that one can lean mathematics using computer without the help of teacher. As seen from the analysis in Table 2, students generally have positive perceptions towards using computers for learning mathematics.

**Hypothesis One**
There is no significant difference among senior secondary students perception on the use of Computer-Assisted Instruction in learning mathematics based on school type (Private, Public, and Unity Schools).

To test this hypothesis, responses of private, public and unity school students were computed and compared using mean, standard deviation, one-way ANOVA statistics. The result of the analysis is shown in table 3.

**Table 3: ANOVA of students’ perception towards the use of CAI for learning mathematics base on school type**

<table>
<thead>
<tr>
<th>Source of Variable</th>
<th>Sum of Square</th>
<th>df</th>
<th>Mean Square</th>
<th>F - value</th>
<th>p - value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>0.349</td>
<td>2</td>
<td>0.175</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td>34.069</td>
<td>537</td>
<td>0.065</td>
<td>2.750*</td>
<td>0.065</td>
</tr>
<tr>
<td>Total</td>
<td>34.418</td>
<td>539</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ns: Not significant at 0.05 level of significance

Table 3 shows the ANOVA results of the mean value of students perceptions towards the use of CAI for learning mathematics based on school type. From the table, the results revealed the difference in the mean value of students in the private, public and unity schools was not significant (F = 2.750; df = 537, p = 0.065). On this basis hypothesis one is therefore rejected. This implies that no significant difference exists in the mean value of students’ perception towards the use of CAI for learning mathematics. In other words, students’ perception based on school type was not differed.

**Hypotheses 2:** There is no significant difference between male and female students’ perception towards the use of Computer Assisted Instruction in learning mathematics.
To test this hypothesis, mean responses of male and female students were computed using t-test statistic. The result is shown in table 5.

**Table 5: t-test analysis of mean value of male and female students’ perception towards the use of CAI for learning mathematics**

<table>
<thead>
<tr>
<th>Variable</th>
<th>No. of Samples</th>
<th>df</th>
<th>Mean (X)</th>
<th>SD</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>270</td>
<td>538</td>
<td>2.72</td>
<td>0.25</td>
<td>2.82</td>
<td>0.66</td>
</tr>
<tr>
<td>Female</td>
<td>270</td>
<td>2.66</td>
<td>0.26</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ns: Not significant at 0.05 level

Table 5 presents the t-test of male and female students’ perception towards the use of CAI for learning mathematics. The mean values of the male students were 2.72 and 2.66 for the female students. The t-value of 2.82 was not significant at the 0.05 level. This indicates that there is statistically no significant difference between the male and female students’ perception towards the use of CAI for learning mathematics, (t = 2.82, df = 538, p = 0.60). Hence, Hypothesis 2 was upheld. Therefore, there is no significant difference between male and female students’ perception towards the use of CAI for learning mathematics.

**Discussion**

The potentials of computer-assisted instruction (CAI) as an educational tool for learning science, technology and mathematics had been well established by several studies. This study investigated the students’ perception towards the use of CAI for learning mathematics in private, public and unity schools in Minna, Niger State, Nigeria. Results from the research question revealed that students held positive perception towards the use of computer-assisted instruction for learning mathematics. This result agrees with the findings of Kennewell and Morgan (2003), Chai, Hong, Huang-Yao, and Teo (2008) and (Yusuf and Balogun (2011) which found that students’ have positive attitude towards the use of ICT. This positive attitude is an important indicator of willingness and first step in effective ICT integration in curriculum. The findings support the earlier findings of Mwei, Too, and Wando (2011) and Reed, Drijvers and Kirschner (2010) who reported higher achievement and positive attitudes with those students taught mathematics using computer-assisted instruction.

The result of hypothesis one reveals that there is no significant difference in the students’ perception towards using CAI for learning mathematics. This result agrees with the reports of Oyelekan and Olorundare (2009) and Patrick (2003) that many schools have incorporated interactive computer-assisted-instruction into their program to provide students opportunities to master specific educational objectives or standards.

The results of hypothesis two shows that there is no gender difference in the perception of male and female students towards the use of computer-assisted instruction for learning mathematics. This finding is in agreement with the results of Yusuf and Balogun (2011) which established no significant difference between male and female student-teachers’ attitudes and use of ICT. It also agree with the finding of Derbyshire (2003) that when girls are given the
same opportunity as boys of access to computer, gender equity does not exist in practice. However, this result is not in agreement with findings of Schaumburg (2001) which established that females tend to be less interested in computer and use them less often in their spare time. It also contradicts the findings of Bebetsos and Antoniou (2008), Kadel (2005), Schaumburg (2001) and Townsend (1997).

**Conclusion**

In this study, it was discovered that students irrespective of school type have positive perception towards the use of CAI and enjoy using it for learning mathematics. Gender had no significant influence on the perception of students towards CAI, and similarly no significant difference was established between male and female student in their interest towards CAI. It was discovered that lack of infrastructural facilities, difficulties in infusing Internet use into the curriculum and also lack of appropriate teacher development are some of the factors impeding the use of CAI in Nigerian schools.

**Recommendations**

The following recommendations were made based on the findings:

(i) Provisions should be made for teachers to be able to integrate ICT-based methodology into their teaching, and also, all classrooms should be equipped with necessary infrastructure and, lastly, all students should be provided with access to media laboratories whenever they want to.

(ii) Since mathematics is one of the subjects perceived as being difficult, the use of using CAI for teaching and learning mathematics in senior secondary schools should be encouraged.

(iii) Seminars, workshops and conferences on the use of CAI and ICT in general should be organized by government and education stakeholders to train teachers in the use of ICT for teaching their various courses.

**References**


