INVESTIGATIVE STUDIES ON TEACHER'S LEVEL OF PREPAREDNESS TOWARDS THE ADOPTION OF COMPUTER-ASSISTED INSTRUCTION(CAI) IN SCHOOLS

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Abstract— The role of teacher in any instructional situation as that of communicator cannot be overstated. The teacher tries to effect changes in the behaviour of the learners by presenting facts and integrating teaching rules and procedure, catching learners' attention by actively involving them in meaningful participation boosting their thinking and stimulating their imagination for effective transfer of knowledge. This is done through spoken words, public address systems, radio, prerecord tapes, computer and other related materials of which computer-assisted instruction (CAI) has been proved effective. Therefore, this research work focuses on the primary school teachers' level of preparedness with respect to their knowledge, skills, attitude and access to computer in preparation for the adoption of CAI. The study adopted a descriptive survey design. The sample of the study was 200 primary school teachers randomly selected from 10 schools in Ibadan North Local Government of Oyo State. Four research questions were generated to guide this study. The instrument used for this study was a prepared questionnaire on the attitude of the teachers towards computer, level of competence of the teachers and the extent of access to computer tools. SPSS was used to analyse the data gathered. The result shows that larger portion (83%) of the teachers have been trained in the use of computer but only 4% of them have been trained in the area related to teaching and learning. It shows that teachers generally have a positive attitude towards the use of computer for instruction, the overall level of competency of the teachers is averagely alright and that teachers' access to computer at school is very low. It is recommended that public and private schools in Nigeria should endeavour to broaden the knowledge of their teachers on the need to adopt computer-assisted instructional package for effective teaching and learning strategies that will allow them to bring out the desirable learning outcome in their learners.

Index Terms— Computer assisted instruction, Teachers, Learning strategies, Attitude, Preparedness

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1 INTRODUCTION

THE adoption of Computer-Assisted Instructions (CAI) as means of enhancing academic achievement tests in the global educational institutions is rapidly diffusing into secondary and primary schools' levels. This growing trend is attracting more researchers' interests. Numerous research studies have been carried out on the influence of CAI on the learning outcomes and performance of students in primary and secondary schools. Salih et.al (2004) investigated the effect of CAI material related to photosynthesis topic on student cognitive development, misconceptions and attitudes. The study was conducted in the year 2002-2003 academic years and was carried out in different classes taught by the same teacher which contain fifty-two grade high school students in central city of Trabson in Turkey. The results obtained showed that the use of CAI materials in teaching photosynthesis topic was very effective for students to reach comprehension and application and cognitive domain.

In Basturk (2005) work, the influence of CAI on the participants in identical mid-term and final examinations was studied. The scores obtained revealed that participants in the lecture plus CAI sections obtained higher averages on mid-term and final examination than participants in the lecture only section. The higher averages were as a result of their better performance on concepts and practices that were taught with both regular and CAI packages in introductory statistics.

Pilli and Aksu (2013) also examined the effect of computer software in Frizbi mathematics 4 and 4th grade students' mathematics achievement, retention, attitude towards mathematics and attitude towards computer assisted learning. In the author's research work, two groups (experimental and control) of primary school students from "Sht. Osman Ahmet" primary school in Gazimagusa, North Cyprus were used in the study. The control group was taught using a lecture-based traditional instruction and the experiment group was taught using educational software called Frizbi Mathematics 4. The control group consists of 26 pupils while the experiment group is made up of 29 pupils. Their findings indicated that frizbi mathematics 4 for learn-

ing and teaching mathematics at the primary school level in Turkish Republic of Northern Cyprus (TRNC) is an effective tool. Furthermore, Serin (2011) study aimed at investigating the effects of CAI on the achievements and problem-solving skills of the science and technology students. The project adopted a design which was based on pre-test and post-test control group. The participant of the study is fifty two students; using 26 in the experimental group and 26 in the control group. The experimental group received the computer-based instruction in science and technology in three hours for three weeks. In Serin's results analysis, the independent group t-test was used at the outset of the study to find out whether the levels of the groups were equivalent in terms of their achievements and problem-solving skills. The results obtained revealed that there is statistically significance increase in the achievement and problem-solving skills of the students in experimental group that received the computer-based science and technology instructions.

Sabzian and Gilakjani (.2013); Adedamola (2015); Dhamija and Kumari (2016); Olanreaju et al (2016); Valencia (2016); Suleman et al (2017); Ode (2018) and Julius (2018) also submitted in their work that CAI increased students' success. In Nigeria, some encouraging efforts have been made on the study that focuses on the effect of CAI on the academic achievement test and performance index of children in our schools. Yusuf and Afolabi (2010) research on the effects of computer assisted instruction on secondary school students' achievement and proved its effectiveness when used in teaching Biology. Yusuf and Afolabi 2010, Anyaneme et al (2012; Fakomogbon et al (2014); Chinwendu and Agommuoh (2017), research papers focused on the effectiveness of CAI and proved its effectiveness in mathematics, geometry, physics, chemistry and biology. Cepni et al (2004) also found in their research work that CAI has a positive effect on the achievement of pupils in science and technology subjects. Anyamene et.al (2012) in their work on the effect of CAI package in mathematics showed that students taught with CAI packages perform significantly better than their counterparts taught using the conventional method of instruction. A robust literature review showed that significant efforts have been made by several researchers in the country on the study of effect of CAI on various subjects offered in primary and secondary schools. The use of CAI package has been proved to be effective for teaching and learning. Government had also made some effort in the integration of ICT in the basic schools by making provision for computers in our basic schools. Despite all these efforts, the role of the teacher in the cause of implementation of the ICT policy is paramount. The teachers' perception towards the adoption of CAI in teaching and learning processes cannot be excluded. The teacher is key to effective implementation of the use of computers in the educational system and given that the teachers have tremendous potential to transmit beliefs and values to their learners. Teachers' attitude towards computer affect the successful use of computers in the classroom and these attitudes, whether positive or negative affect how the teachers respond to

technologies (Sabzian and Gilakjani ,2013). Mukti (2000) carried out a research work on the teachers' background, characteristics, attitudes and concerns in Malaysia and the result of the study showed that these factors have a great significance in the degree of the classroom computer used. Buabeng-Andoh (2012), on a study to explore teacher's skills, perceptions and practice about ICT in second-cycle institutions in Ghana. Questionnaires were distributed to 273 teachers in different department, the validity of the questionnaire was done by the panel of experts in the field. The correlation analysis reveals positive correlation between ICT use and Teachers competency. The teachers' perceptions in terms of the usage of ICT were also found to be positive but statistically not significance. The descriptive analysis of their result indicated that teachers' knowledge in basic ICT application as well as integrating ICT into teaching and learning processes was low. The result of Buabeng-Andoh in Ghana provide evidence that the introduction of ICT in teaching and learning has not brought significant change in the delivery of lessons in second-cycle schools in Ghana which implies that teachers have not shifted from the teacher-centered to learner-centered learning. In Nigeria, Aremu and Adeddiran (2011) studied the readiness of the secondary schools' teachers to integrate information and communication technology into teaching and learning processes. The study adopted a descriptive survey using two questionnaires (teachers technology preparedness questionnaire and basic information and technology practical skills activities) was used to collect data from a total of 470 teachers who were selected through the simple random technique. The result reveals that the teachers have a positive attitude towards the use of information and communication technology though the teachers have low level of knowledge of ICT and also lack adequate IT skills. Okeyo (2013), conducted a research work on the training levels of the head teachers and the usage of computers in public primary schools. The research was also aimed to determine the attitude of the teachers towards the use of computer in teaching and learning processes. The findings reveal that, there are very few ICT literate head teachers and they all have a positive attitude towards the use of computer in teaching in public primary schools. Similar studies on attitudes and perception of teachers towards adoption of CAI have also been reported in Serin et al (2015); Zupanec et al (2017) and Molenje et al (2017).

Despite the aforementioned tremendous efforts, robust research works have not been made on the level of the teachers' preparedness in the adoption of CAI into basic schools' subjects' teaching. If CAI is to be properly adopted into the basic school system, there is a need to examine the level of preparedness of the basic school teachers. A lot of research work had been done on the use of CAI and prove effective and just few were done on the readiness of the teachers in terms of skills, knowledge and attitudes of the teachers towards CAI. This research gap serves as a strong motivation for the present study. Therefore, this paper focuses on the level of preparedness of the basic school teachers towards the adoption of CAI package using selected schools in

Akinyele Local Government of Ibadan in Nigeria as a case study.

2 METHODOLOGY

2.1 Research Design

The design selected for these was descriptive survey. Descriptive focuses on determining the status of a defined population with respect to certain variables (Bernard et.al 2014). The major advantage of this is that it helps the researchers to gather a great amount of data in a short period of time. A descriptive survey is a method of collecting information by administering questionnaire to a sample of individual. A descriptive survey provides a quantitative technique providing description of people's trends, attitudes or opinions of a population by studying a sample of the population. Given that in this study, questionnaire was administered to a sample of teachers in Akinyele local government, this design would be most appropriate for the study.

2.2 Target Population

The researcher makes use of public primary school teachers in Akinyele local government of Oyo state. Nigeria. The respondents were chosen due to their day to day contribution in the school administration

2.3 Sampling and Sampling Techniques

The sample for this study consists of two hundred (200) primary schools' teachers from 10 selected schools in Akinyele local government of Oyo state. The sampling was done using simple random sampling technique.

2.4 Research Instrument

In order to explore the level of preparedness of the teachers in the adoption of CAI in public primary schools in Akinyele Local Government, the data was gathered using a descriptive questionnaire. The questionnaire was for only the primary school teachers, thus through the questionnaire, the research question developed by the researchers were answered. The questionnaire covers the following areas; demographic information, attitude of the teachers towards the use of computer in teaching, the level of the teacher's computer knowledge, the skills of the teachers in computer and access to computers in public primary schools to support the general school administration. The choice of this instrument was due to the fact that it gathers data over a large sample, information can be collected from diverse regions and confidentiality is upheld. All these conditions befit these studies that seek to investigate how

prepared are the primary school teachers in using computer assisted instruction (CAI) in Akinyele local government municipal.

2.5 Validity of Instrument
The content validity was used for this research study. The content validity is a measure of the internal degree to which data is collected through a particular concept. Test-retest was done and the items that failed to measure the variables were modified and others that did not relevant were discarded. The school that was used for the piloting was excluded from the main study. A consultations and discussion with the supervisors and experts in the area of technology education was also done to establish the content validity.

2.6 Reliability of the Instrument
Reliability is defined as a measure of consistency of an instrument over a period of time. An instrument is reliable if it yields a consistent result over a period of time. The consistency of the questionnaire used was determined by a test-retest.

The pre-test was done through piloting in one public primary school, thus Pearson's correlation coefficient formula(r) was used and the reliability coefficient was found to be 0.82. The formula for Pearson's correlation coefficient formula is

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

Where:

n = number of pairs of scores

∑xy = sum of the products of paired scores

∑x = sum of x scores

∑y = sum of y scores

$\sum x^2$ = sum of square x scores

$\sum y^2$= sum of square y scores

2.7 Data Collection Procedure
The administration of the questionnaire for the purpose of the data collection was done by the researcher both at the pre-testing stage and the main study. The research permit was gotten from the head of Department of the teacher education of which a copy was presented to the sampled head teacher of public primary schools in Akinyele local government. The sample teachers were given questionnaire to

fill which were collected on a later date agreed upon by the researcher and the respondents.

2.8 Data Analysis Techniques

Analysis of the data started with checking of the gathered raw data for accuracy, usefulness and completeness. Quantitative data which were gathered from the demographic sections of the questionnaires and other closed questions were analysed using statistics that included the use of percentages and frequencies. The qualitative data that are generated from the open-ended questions in the research instrument were organized and categorized through the content analysis and the tabulated. The data was computed using the statistical package for social sciences (SPSS) into descriptive data.

3   RESULTS AND DISCUSSION

3.1 Results: Charts Analysis of Response Data

Fig.1 shows that out of the 200 teachers that participated in this study, 62% are females while 38% are males. Fig.2 shows the professional qualification distributions of the sampled teachers. Out of the 200 teachers involved in this study, 41 and 68 teachers have Masters and Bachelor degrees in education respectively while 47 and 48 respectively have NCE and Diploma. This implies that 54.5% of the teachers that participated in this study have the minimum qualification of Bachelor of education (B.Ed.). Fig.3 shows that approximately 7% of the teachers have more than 20 years of teaching experience. 5%, approximately 19%, 33% and 36% of the teachers respectively have 16-20 years, 10-15 years, 6-10 years and 1-5 years of teaching experience. Fig.4 shows that out of the 200 teachers that were engaged in this study, only 4% have been trained in the use of basic computers that are directly related to teaching. Fig.5 shows the bar charts analysis of research question 2. In 200 respondents were considered in the survey of attitudes of primary school teachers. 91.5 %, 59%, 87%, 74.5%,91.5%,83%,91%,81%,60.5% and 60% are respectively in the agreement that; computer can make teaching easier, computers are not difficult to use, computer knowledge will assist them to do well in their teaching career, anything that computers can be used for can as well be done by other means, computers when used in school will improve educational activities, computers will relieve teachers

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of their routine duties, teaching with computers offers real advantages over traditional method of instructions, computers use fits well into the curriculum, computers use is
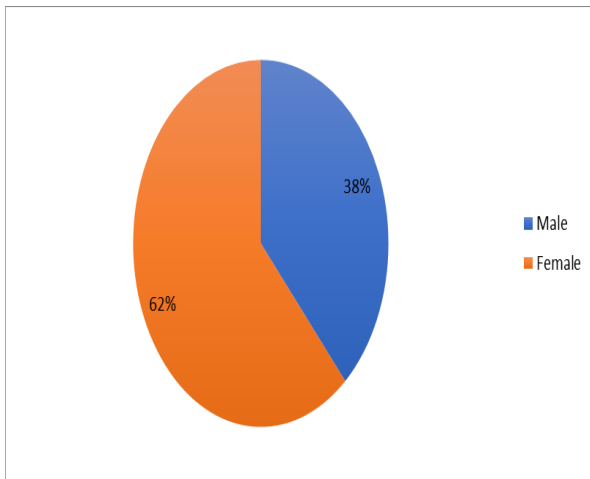
not limited to class time and that computers use will complicate their tasks. Fig.6 gives bar charts analysis of research question 3(RQ3). Analysis of the responses obtained from the 200 teachers shows as follows:

- 88.5% of the respondents can on and off computer
- 94.0% of the respondents can use computer keboard
- 84.5% of the respondents can use a word processing program
- 71.0% of the respondents can use a spread sheet program
- 62.0% of the respondents can use power points program
- 50.0% of the respondents can use a database program
- 67.0% of the respondents can use a printer
- 61.5% of the respondents can use the internet communication
- 60.0% of the respondents can use the world wide web to access information
- 67.0% of the respondents can solve simple problems in computer operation.
- 60.0% of the respondents can use computer for grades keeping
- 72.0% of the respondents can select and evaluate educational software
- 67.0% of the respondents can create and organise files and folders
- 2.5% of the respondents can remove computer viruses

Fig.7 shows bar charts analysis of research question 4 (RQ4). From the response obtained from the 200 teachers that participated in the study, the following analysis is evident:

- At home: 69%, 6%,7.5%,5.5% and 11.5% respondents respectively have access to computers at home daily, 2 or 3 times a day, once a week, once month and neve
- At School: 41%, 9.5%,20%,14% and 15% respondents respectively have access to computers at school daily, 2 or 3 times a day, once a week, once month and never
- Other Sources (e.g cybercafé): 39%, 14%, 23.5%,20% and 2.5% respondents respectively have access to computers from other sources daily, 2 or 3 times a day, once a week, once month and never.

Fig.1: Gender Distribution of Teachers

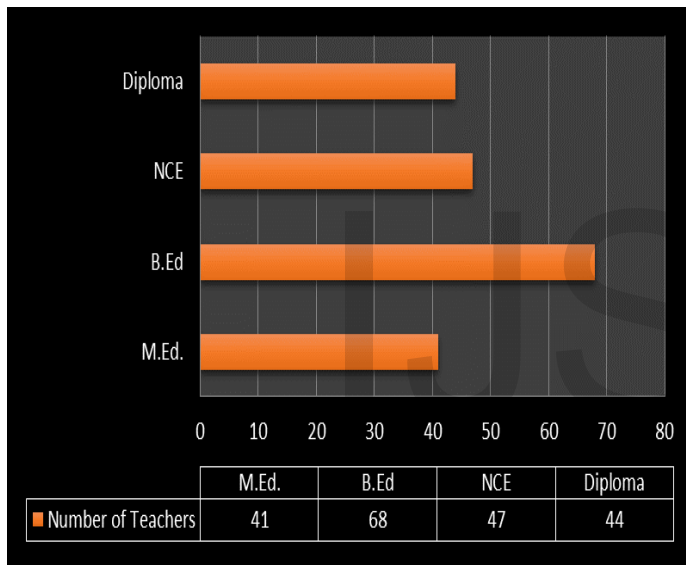|	M.Ed.	B.Ed	NCE	Diploma
Number of Teachers	41	68	47	44

Fig.2: Professional Qualification Distribution of Teachers
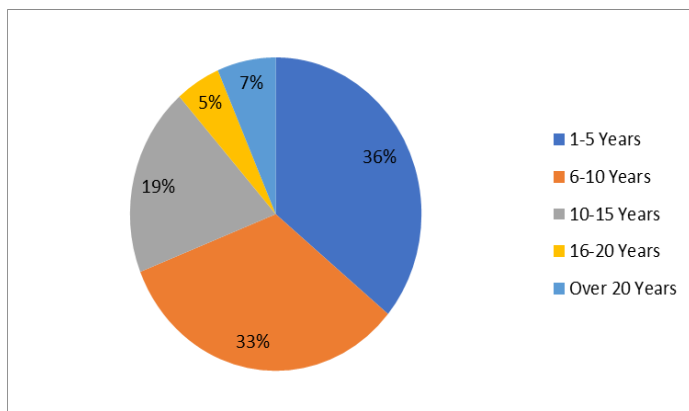

Fig.3: Teachers Years of Teaching Experience

RQ1: To what extent do the primary school teachers acquired ICT training in preparations for the adoption of computer-assisted instruction package?
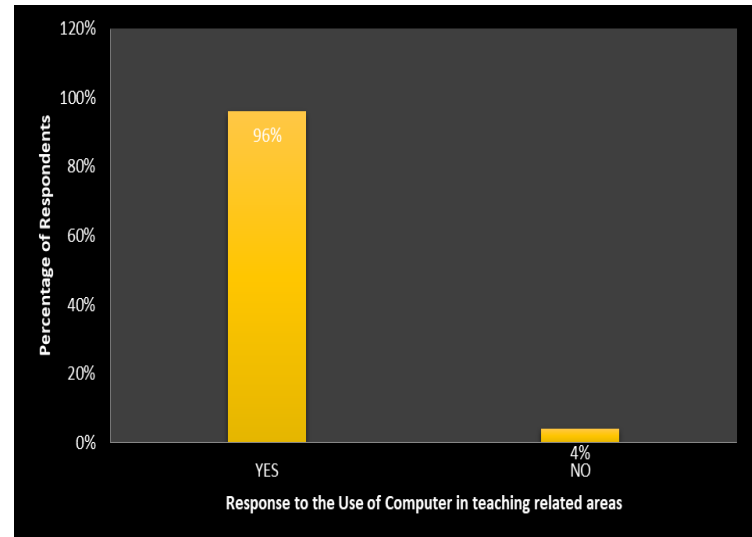

Fig.4: Bar Charts Analysis of RQ1 Item

RQ2: What is the attitude of primary school teacher towards the adoption of computer-assisted   instruction?
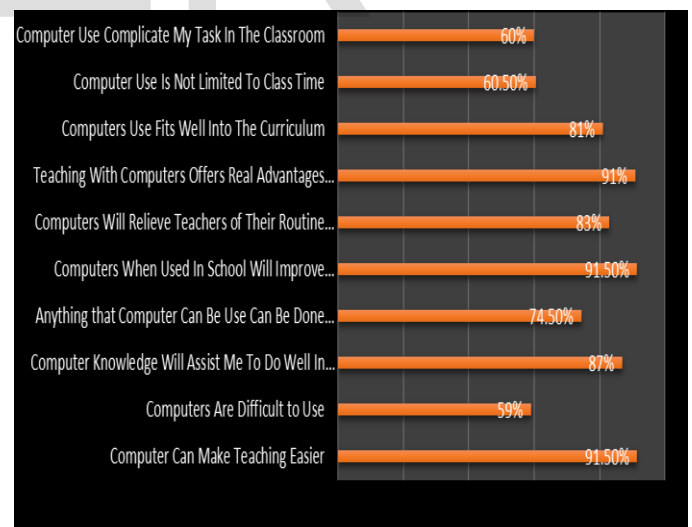

Fig.5: Bar Charts Analysis of RQ2 Items

RQ3: What is the level of competence of primary school

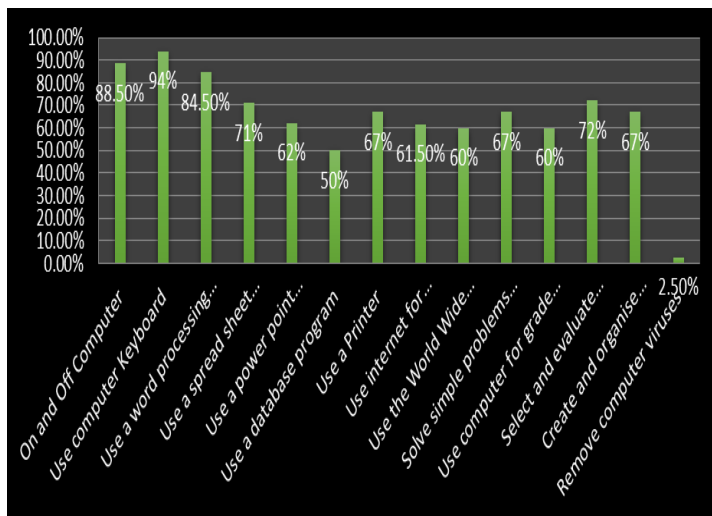teachers in using computer for instruction?

Fig.6: Bar Charts Analysis of RQ3 Items

RQ4: To what extent do the primary school teachers have
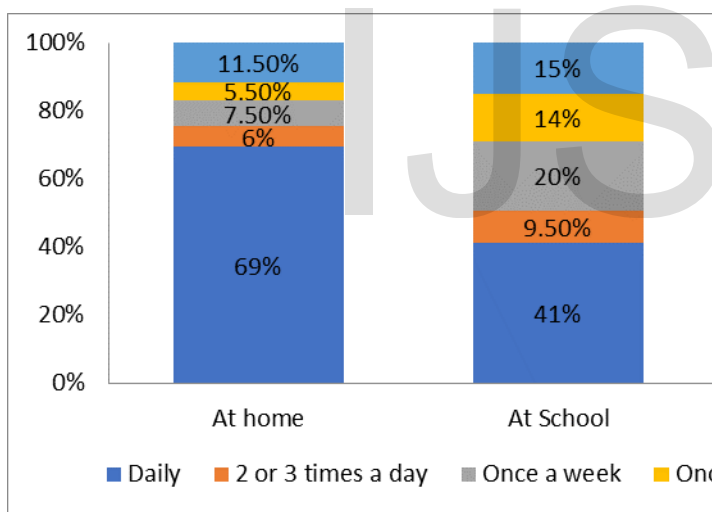
access to ICT tools?

Fig.7: Bar Charts Analysis of RQ4 Items

3.2 Discussion

The results of the first research question reveal that larger proportion of the primary school teachers (about 83%) have received training in the use of computer but only 4% of them that have received training in the area related to teaching and learning. This very low level of training of primary school teachers in the use of computers related to teaching is a serious indication that satisfactory preparations have not been made in the area of ICT training towards the adoption of CAI. This finding is in line with the work of Aremu et al (2011) that found out that the teachers do not have adequate skills in it. The second research ques-

tion result shows that generally the attitude of the teachers toward the use of computer is positive. The weighted average of 3.84 (on a scale of 5) shows that teachers have good attitude towards the use of CAI. This finding is supported by the results obtained in the bar charts analysis that 91.5%, 59%, 87%, 74.5%, 91.5%, 83%, 91%, 81%,60.5% and 60% of the respondents have positive responses to items 1-10 respectively. This finding is in agreement with the work of Baubeng (2012) that carried out a research on teacher's skills, perceptions and attitude on use of ICT as a tool teaching in Malaysia.

The third research question focuses on the competence levels of primary school teachers in the use of computer. With the weighted average of 2.8 (on a 5 scale), the competency level can be considered to be above average and satisfactory. This result is supported from the bar chart analysis of the responses obtained from the participated teachers. Except for item 10 where the competency level of teachers on removal of computer viruses is very low, 88.5%, 94%,84.5%,71%,,62%,50%,67%,60%,72% and 67% of the respondents shows satisfactory positive competency level in items 1-9. The general high competency level obtained is reasoned to be the reflection of positive attitudes outcome of teachers towards the adoption of CAI.

The fourth research question also revealed that generally the teachers have access to computer tools at home than in schools. The weighted average of the total access to computer, both at home, school and by other means mean is 3.76. The access of teachers to computer is high at home but low in school. On daily basis, the bar charts analysis shows that 69% of the respondents have access to computers at home while only 41% of them have access at school. A very large number of the teachers have access to computer but small percentages of them have access to compute tools at school.

3.3 Implication of Findings

It is very germane to examine the implication of this study to education at large. There is need for school to inculcate into the learners' good altitude, moral behaviour and societal norms and value. This will help them to understand their physical environment and know how to effectively interact with it and at the same time improve drastically their academic achievements.

Educators are to be enlightened on the needs to adopt effective teaching method and strategies in order to bring out their pupils their natural endowed potentials. CAI has been shown to be an effective and efficient tool in bringing out the desirable learning outcome in children and also increased their attention span. Teachers should be encouraged to have a good attitude towards the adoption computer assisted instructional package. The government should create interest in making provision for the training of the teachers in the area of computer related to teaching and learning. Efforts should be made in order to improve the level of competency of the primary school teachers in their area of computer use which will in turn empower them in using it for instructional purposes. Universities and colleg-

es of education should encourage and expose the teachers-in-training to the use of computer for instructional purpose in order to follow the new trend of development. They should be equipped on how to use computer for instructional purpose in order to bring out the best in the learners. Significant efforts should be made by government to enhance teachers' access to computer at school in order to make it accessible for easy integration of computer-assisted instructional package. Public schools should also ensure that there is adequate use of the available computers in the school and proper maintenance of the systems.

4 CONCLUSION, RECOMMENDATION AND SUGGESTIONS FOR FUTURE RESEARCH WORK

In this study, the following conclusions can be made:

1. Teachers in the selected primary schools have not been trained in the use of computers as effective tools for teaching. This implies that adequate efforts have not been made by ministry of education and schools managements in enhancing the level of preparedness of teachers towards the adoption of computer assisted instruction (CAI) as a teaching package in primary schools.

2. Teachers generally have positive attitudes towards the adoption of computer assisted instruction (CAI) as teaching package for primary school pupils. This general positive attitude is an indication of teachers' high level of preparedness towards the use towards the implementation of computer assisted instruction (CAI) as a teaching package in primary schools.

3. The competency levels of the selected primary schools' teachers in the use of computer assisted instruction (CAI) for teaching is generally high. This general high competency level in the use of computers shows that teachers have the required potentials to learn fast when trained on the use of computer as an effective tool for teaching primary school subjects. The teachers' high competency in computers is an indication of satisfactory level of

their preparedness towards the integration of computer assisted instruction (CAI) in teaching primary school subjects.

4. Access of teachers to computers in primary schools is low when compared to their access in homes. This finding is another indication that the ministry of education and primary schools' management has not properly put measures that equips school computers facilities on ground. This will in no small measure affects the extent of the preparedness of primary school teachers towards the integration of computer assisted instruction (CAI) package as a teaching tool.

5. The level of preparedness of teachers towards adoption of computer assisted instruction (CAI) is capable of enhancing teachers teaching ability and performance which will in turn increase pupils' attention span and their overall academic achievements.

4.2 Recommendations

The following recommendations are made as an aftermath of the findings reported in this work:

1. Public and private schools in Nigeria should endeavour to broaden the knowledge of their teachers on the need to adopt effective teaching and learning strategies which will encourage learners' centred classroom setting of which the interest, needs and the children potentials will be put into consideration in order to bring out the genius in them.

2. The effect of computer-assisted instruction should be projected to both the teachers and parents for them to know the implication on the learners and also help the parents in purchasing computer related learning aids and toys for their children.

3. The learners should be exposed to instructional materials that will not have negative influence their learning thereby motivating the intrinsically to learn. This will definitely improve their academic and moral achievements in school.

4. Parents should be involved in the education of their children; this will thereby help them to plan adequately for their children and in turn move along with the pupils' progress in school.

4.3 Suggestions for future research

The following suggestions are made to the interested re-

searchers who may be willing to further work in this regard:

1. This Study investigated the level of preparedness of the primary school teachers towards the adoption of computer assisted instruction (CAI) package in terms of their knowledge, skills, attitude and access to computer tools. In view of this, further researches may be carried out in other local government areas in the Oyo state (or Nigeria as a whole).

2. The influence of other possible factors such as environment, ages and qualifications of teachers on the level of their preparedness can also be investigated.

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