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Perception of Gender and Academic Qualifications on The Application of Computer-Assisted Instruction in Secondary Schools in Ukwuani LGA, Delta State

La Portée Du Genre Et Des Titres Académiques Sur L'enseignement À L'aide De L'informatique Dans Les Écoles Secondaires D'ukwuani, Dans L'état Du Delta

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Abstract

The study examined the perception of gender and academic qualifications on the application of computer-assisted instruction in secondary schools in Nigeria. The study was delimited to Ukwuani LGA, Delta state. Two research questions with two hypotheses propelled the direction of the study. A descriptive design of the survey method was utilized for the study. The population consisted of all secondary school teachers in Ukwuani LGA, Delta state. The simple random sampling technique was employed in selecting twenty (20) secondary schools from which an average of eleven teachers (11) were purposively selected from each school, constituting a total sample of 211. The instrument used to obtain information from respondents was the questionnaire titled: Computer Assisted Instruction Inventory (CAII). The items were designed by the researcher. The instrument was divided into three sections: A, B and C. Section A constituted the biographic information of respondents, B contained items on teachers' application of CAI method in teaching secondary school students and C was concerned with the aspects of the challenges facing Computer Assisted Instruction. The questionnaire adopted a 4-point Likert-type scale. The data collected were analyzed with frequency distribution, descriptive statistics, the t-test (IST) and the one-way analysis of variance. The statistics were chosen for the analyses because of their robust nature of comparing the means of two or 3 variables. Hypotheses were tested at 0.05 significant levels. The outcome of the research revealed that teachers do not readily apply CAI method in teaching secondary school students in Ukwuani LGA, Delta state. Challenges in the effective application of CAI method in teaching secondary school students in Ukwuani LGA, Delta

state were indeed enormous. However, gender and academic qualifications did not have a significant effect on the use of CAI by teachers. Based on the conclusion reached, several recommendations were made which include among others that teachers' should be adequately trained in computer education to maximize the use of Computer- Assisted Instruction method in teaching Secondary schools. Government should provide computers and related software in secondary schools by either supplying them directly or making financial provisions for school heads to purchase them and the government should provide solutions to the challenges of Computer Assisted Instruction services in schools by providing enabling environment in schools.

Key Words: *Computer Assisted Instruction, secondary education, secondary school teachers*

Resume

Cette étude a abordé la perception du genre et des titres universitaires sur l'enseignement à l'aide de l'informatique dans les écoles secondaires au Nigeria. L'étude a été concentrée à la region d'Ukwuani en état Delta. Deux questions de recherche et deux hypothèses ont déterminé la trajectoire de l'étude. L'étude a été réalisée selon la méthode d'enquête descriptive. La population était composée de tous les enseignants du secondaire de la région d'Ukwuani, dans l'État du Delta. La technique d'échantillonnage par randomisation simple a été employée pour choisir vingt (20) écoles secondaires à partir desquelles une moyenne de onze (11) enseignants a été choisie à dessein dans chaque école, constituant ainsi un échantillon total de 211 personnes. L'instrument employé pour obtenir des informations des répondants était le questionnaire intitulé : Computer Assisted Instruction Inventory (CAII). Les questions ont été conçues par le chercheur. L'instrument était divisé en trois sections : La section A contenait les informations biographiques des personnes interrogées, la section B contenait des questions sur l'application par les enseignants de la méthode CAI dans l'enseignement aux élèves du secondaire, tandis que la section C concernait les aspects des défis auxquels l'enseignement à l'aide de l'informatique se fait face. Le questionnaire a adopté une balance de type liket à 4 points comme format dactylographié. Les données recueillies ont été analysées à l'aide de la distribution des fréquences, de statistiques descriptives, du test t (IST) et de l'analyse de variance à sens unique. Ces statistiques ont été choisies pour les analyses en raison de leur nature robuste de comparaison des moyennes de deux ou trois variables. Les hypothèses ont été évaluées à un niveau de signification de 0,05. Le résultat de la recherche a révélé que les enseignants n'appliquent pas facilement la méthode CAI dans l'enseignement aux élèves

des écoles secondaires dans la region d'Ukwuani, Delta state. Les défis de l'application efficace de la méthode CAI dans l'enseignement aux élèves des écoles secondaires d'Ukwuani , Delta State, sont en effet immenses. Cependant, le rôle du sexe et des titres universitaires n'a pas eu d'effet significatif sur l'utilisation de l'EAO par les enseignants. Sur la base des conclusions tirées, plusieurs recommandations ont été formulées, dont les suivantes : les enseignants devraient recevoir une formation adéquate en informatique afin de maximiser l'utilisation de la méthode d'enseignement assisté par ordinateur dans les écoles secondaires. Le gouvernement devrait fournir des ordinateurs et des logiciels connexes dans les écoles secondaires, soit en les fournissant directement, soit en faisant des provisions financières aux chefs d'établissement pour les acheter, et le gouvernement devrait apporter des solutions aux défis des services d'enseignement à l'aide informatique dans les écoles en fournissant un milieu favorable dans les écoles.

Mots clés: *Enseignement à l'aide informatique, enseignement secondaire, enseignants des écoles secondaires*

Introduction

The world is in a state of unprecedented technical transformation and education is not left out as it continued to benefit from various scientific reforms. Computer and computer-based gadgets have translated teaching and learning into electronic form. This development has revolutionized education and brought innovation to it. The world is now in the computer age and there is a need for stakeholders in education to acquire the necessary knowledge and skills on the use of computer hardware and software which can be achieved by introducing computer education in school (Ajibade, 2006).To this end, Ogunloye (2009) has averred that for instructional processes to become effective, innovative and contemporary ICT tools need to be integrated into educational practices while teachers need to be educated for the purpose.

Electronic learning is progressively becoming acceptable in schools globally and more schools are gradually adopting it. Digital learning utilizes information and communication technologies (ICTs) in the enhancement of learning, instruction and research (Eteng & Ntui,

2009). E-learning evolved from traditional teacher-directed of teaching to contemporary strategies where computer and computer-based technologies improve the effectiveness and efficacy of the teaching and learning objectives. World Wide Web, multimedia, information exploration and e-libraries are components of electronic learning (Ogunlela & Ogunloye, 2014). Today, teachers require appropriate knowledge of information technology and skills to effectively comprehend educational resources, develop and design course contents and translate them to learners in the classroom (Rosenberg, 2001).

Computer-assisted training (CAI) is an interactive instructional process where computers are utilized in presenting course contents and scrutinising the knowledge outcomes. CAI refers to the use of computer tools to ease and advance teaching. Because of the advancement of computer technology, the application of Computer Assisted Instruction (CAI) has become a trend in schools (Yang & Wang, 2001). CAI employs the use of tutorials, practice, recreation, and problem-solving strategies during class lessons. Computers have tremendous benefits in schools as they can be readily employed to assist students in every aspect of the school syllabus.

Evidence abounds on the need for the introduction of computers in our schools. World Bank (2004) stipulated that ICTs should be incorporated in schools for the review of the core curriculum, enhancement of teaching and improvement in learning. CAI has the potential to improve the educational achievement of slow learners and students who are physically or mentally challenged. CAI uses a variety of resources like animation, words and pictures to engage the different sense organs in the process of learning. Computers can stimulate various senses and present information in a variety of ways that enhance the learning process. CAI can help learners' to develop knowledge and skills in literacy as well as inculcate information and communication technology skills that are essential in the world of work (CILIP, 2005; Ogunloye, 2010). With self-directed learning, learners can move at their pace and can decide what they want to learn during their study.

Irrespective of the dazzling prospects of CAI in schools, many hurdles are militating against its effective applications in Nigeria. With self-paced programmes, learners are often left alone and may feel inundated by the available information and resources on the website. The study of Folorunso, Ogunseye and Sharma (2006) and the work of Resnick (2002) indicated poor level of awareness, computer illiteracy and high cost as responsible for the lack of accessibility and acceptability of digital learning to Nigerians. Schulmeister (2006) opined that the benefits of the application of computer-assisted instruction are yet to be fully deployed and the rationale for the use of instructional technology has not been transformed into actual improvement in learning.

Various barriers to Computer Assisted Instruction in Nigerian schools are poor infrastructure, erratic power supply, unqualified resource persons, poverty, poor funding and unstable accessibility to internet facilities (Aladejana, 2007; Jegede, 2005). The high cost of accessing the internet in Nigeria is still unbearable as students find it unaffordable (Arikpo, Osofisan, & Usoro, 2009). Some students do not own their personal computers due to their high costs against the backdrop of the low wages of employees in Nigeria (Ajadi, Salawu, &Adeoye, 2008). Uneven access to technology among students is also a challenge to the application of computer-assisted instruction in Nigeria (Omofaye, 2007). Diane , Camilla , David , Ruben., Shibley, and Morton (2007) stressed that gender differences in the performance of mathematics and related sciences could be due to differences in interests and intellectual abilities. The above factors explained why teaching and learning strategies have remained unchanged from the old practices to contemporary computer-driven instructions.

National Policy on Education (2004) brought to the fore the importance of CAI learning in our school system. It stipulated the provision of highly skilled manpower for national development which can only be achieved through the application of computer-assisted teaching, learning and research. Effective utilization of new technologies requires teachers to possess in-depth knowledge of computer applications and be proficient in integrating the skills into instruction. Teachers, irrespective of gender, need to improve their academic

qualifications and reduce gender bias in science-related disciplines (Amede, 2020).

Computers have been provided in many institutions in Nigeria by the government, school proprietors and philanthropists with the sole objective of inculcating technological skills in teachers and students. However, to maximize computer skills and efficiently utilize them in the development of individuals and society, it is important to commence such an adventure at an early age. This makes this study expedient; to examine perceived teachers' gender and academic qualifications on the application of computer-assisted instruction in secondary schools in Ukwuani LGA, Delta state.

Statement of the Problem

Computer Assisted Instruction is a giant attempt at integrating the application of computer-assisted instruction in school to enhance effective learning, especially at the secondary school level. Nigeria is yet to be maximally benefited from the potential of technology in the enhancement of teaching and learning. Many of our schools are lagging in integrating technology into teaching. Most parents cannot afford computers for their wards, school proprietors manage schools without computers and internet facilities, and governments leave school libraries ill-equipped technologically. Lack of digital technology limit students from attaining their full academic potential thereby denying the nation of much-needed human capital.

No doubt, Computer Assisted Instruction has numerous advantages to individuals and societies. It affects opportunities for learning course contents through words, pictures and animation and can repeatedly help students to retain information. These advantages can only be fully maximized when teachers improve their academic qualifications and bridge the gap between gender biases in the sciences. This forms the nexus of this research undertaking; to examine teachers' gender and academic qualifications in the application of computer-assisted instruction in secondary schools in Ukwuani LGA, Delta state.

Purpose of the study

The study examined the influence of teachers' gender and academic qualifications in the application of computer-assisted instruction in secondary schools in Nigeria. The study was delimited to Ukwuani LGA, Delta state. Specific objectives of the study are to:

1. Ascertain the extent to which teachers apply CAI method in teaching secondary school students in Ukwuani LGA, Delta state.
2. Examine the challenges encountered by teachers in the effective application of CAI method in teaching Secondary school students in the Ukwuani LGA, Delta state.
3. Determine the gender effects of the teachers in the application CAI method in teaching secondary school students in Ukwuani LGA, Delta state.
4. Establish the difference in the application of CAI method in teaching secondary school students based on teachers' academic qualifications.

Research Questions

The following research questions guided this study:

1. To what extent do teachers apply CAI method in teaching secondary school students in Ukwuani LGA, Delta state?
2. What are the challenges encountered by teachers in the effective application of CAI method in teaching secondary school students in Apapa Lagos?

Hypotheses

H_1. There is no significant difference between male and female teachers in the application of CAI method in teaching secondary school students in Ukwuani LGA, Delta state.

H_2. There is no significant difference in the application of CAI method in teaching secondary school students in Ukwuani LGA, Delta state based on teachers' academic qualifications.

Methodology

The descriptive approach using the survey design was utilized for this research work as it is an efficient method of gathering data directly from respondents and for the convenience and quick return of data. The population consisted of all secondary school teachers in Ukwuani LGA, Delta state. The simple random sampling technique was used to select twenty (20) secondary schools in Ukwuani LGA, Delta state. An average of eleven (11) teachers was purposively selected from each school, constituting a total sample of 211. The instrument used to obtain information from respondents was the Questionnaire titled: Computer Assisted Instruction Inventory (CAII). The instrument which was designed by the researcher was sub-divided into three sections: A, B and C. Section A constituted the biographic information of respondents, B contains items on teachers' application of CAI method in teaching secondary school students while section C was concerned with the aspects of the challenges facing Computer Assisted Instruction. The questionnaire adopted the 4-point Likert scale, ranging from strongly agree to strongly disagree.

Validation of the Instrument

The instrument was validated by presenting it to some experts in the Faculty of Education, at the National Open University of Nigeria to make necessary corrections. Due to the experts' contributions and corrections made, the instrument was considered valid, as it measures what it tends to measure for the study.

To determine the reliability of the instrument, it was administered to a sample of 30 students from schools in Agege in Lagos state, which was outside the intended study population. The test re-test method was utilized in the pilot study. Cronbach alpha statistics was used to analyze the data from both tests and the coefficient reliability of 0.83 was established.

Administration of the Instrument

The researcher solicited the support of principals of selected secondary schools. The questionnaires were distributed to the teachers and subsequently collected. The questionnaires were administered to 220

secondary school teachers. The instruments were administered by the researcher and four research assistants. The purpose and intent of the research were well explained and copies duly distributed. All respondents were given adequate time to fill in the questionnaire and were at no time under any form of duress. Out of the 220 questionnaires administered, 210 were retrieved, which constituted 95%.

Method of Data Analysis

The data collected were analyzed with descriptive statistics, the t-test and the one-way ANOVA at 0.05 significant levels. Descriptive statistics was chosen for the analysis because of its robust nature. A 2.5 weighted mean was used to evaluate the outcomes of the analyses of data on the Research Questions.

Presentation of Results

Research Question 1: To what extent do teachers apply CAI method in teaching secondary school students in Ukwuani LGA, Delta state?

Table 1: Mean analysis of the extent to which teachers apply CAI method in teaching secondary school students in Ukwuani LGA, Delta state.

S/N	RATING ITEMS	N	Sum	Mean	Std. Deviation	Remark
1	Teachers apply the Computer-assisted instruction (CAI) method to present instructional materials in class lessons.	210	445.5	2.12	.71	Disagreed
2	Computer-assisted instruction (CAI) helps teachers to monitor the learning outcome.	210	451.5	2.15	.66	Disagreed
3	Teachers use the CAI method to teach slow learners in school	210	453.6	2.16	.67	Disagreed
4	Teachers use the CAI to record learning materials.	210	438.9	2.09	.60	Disagreed

5	Teachers use the CAI method to teach students handwriting skills.	210	472.5	2.25	.54	Disagreed
6	Teachers use the CAI learning technique to inculcate reading skills in students.	210	441	2.10	.57	Disagreed
7	Computer Assisted Instruction help teachers to effectively utilize various mass media for instruction	210	474.6	2.26	.56	Disagreed
8	Teachers use the CAI method to teach students how to sing and dance.	210	426.3	2.03	.67	Disagreed
9	Teachers use the CAI method to teach students with learning difficulties.	210	499.3	2.38	.81	Disagreed
10	Teachers use the CAI method to teach practical lessons to students.	210	468.3	2.23	.72	Disagreed
	Total	2100	4571.5	2.18	0.61	Disagreed

The result in Table 1 above shows a total of 4571.5, an average of 2.18 and a standard deviation of 0.61. Going by the norm of the scale (CAII), it could be observed that the score fell below the average score of 2.5. It could be concluded that teachers do not readily apply the CAI method in teaching secondary school students in the local government area.

Research Question 2: What are the challenges faced by teachers in the effective application of the CAI method in teaching secondary school students in Ukwuani LGA, Delta state?

Table 2: Mean rating on the challenges faced by teachers in the effective application of the CAI method in teaching secondary schools students in Ukwuani LGA, Delta state

S/N	Rating items	N	Sum	Mean	Std. Deviation	Remark
1	Cultural considerations about computer education.	210	656.00	3.12	.71	Agreed
2	Teachers' attitude of teachers towards the use of computer.	210	661.00	3.15	.66	Agreed
3	Learners environment	210	663.00	3.16	.67	Agreed
4	Inadequate information about computer education.	210	656.00	3.12	.60	Agreed
5	Internet accessibility.	210	682.00	3.25	.55	Agreed
6	Poor funding/poverty of computer education.	210	652.00	3.10	.57	Agreed
7	Teachers' computer anxiety.	210	684.00	3.26	.58	Agreed
8	Computer software accessibility.	210	636.00	3.03	.69	Agreed
9	Poor computer-enabling infrastructure.	210	583.00	2.78	.81	Agreed
10	Learner's background knowledge/computer literacy.	210	678.3	3.23	.72	Agreed
	Total	2100	6551.6	3.12	0.66	Agreed

Table 2 revealed the mean rating on the challenges encountered by teachers in the effective application of the CAI method in teaching secondary school students in the local government area. Teachers' computer anxiety top the chart with an average mean of 3.26, closely followed by internet accessibility (3.25), learners' environment (3.16), Teachers' attitude of teachers towards the use of computers (3.15) and lastly poor computer-enabling infrastructure with an average mean of 2.28. The table's average mean of 3.12 is above the weighted score of 2.5. The implication is that the challenges facing the effective application of the CAI method in teaching secondary school students in Ukwuani LGA, Delta state are indeed enormous.

Hypothesis 1: There is no significant difference between male and female teachers in the application of the CAI method in teaching secondary school students in Ukwuani LGA, Delta state.

Table 4: T-test statistics on the difference between male and female teachers on the use of the CAI method in teaching secondary schools students in Ukwuani LGA, Delta state

Gender	N	Mean	Std. Deviation	Std. Error Mean	df	t	Sig.
Male	109	1.45	.500	.05	208	.928	.079
Female	101	1.39	.49	.05			

At .05 significant level

The result in Table 3 above is a t-test analysis on the difference between male and female teachers in the application of the CAI method in teaching secondary schools students in Ukwuani LGA, Delta state, at t (.928), df= 208, P>.05, with a mean of 1.45 for male and 1.39 for female. Hypothesis 1which states that there is no significant difference between male and female teachers in the application of the CAI method in teaching secondary school students in Ukwuani LGA, Delta state was therefore accepted. The implication is that there is no significant difference between male and female teachers' application of the CAI method in teaching secondary school students in Ukwuani LGA, Delta state.

Hypothesis 2: There is no significant effect of teachers' academic qualifications in the application of the CAI method in teaching secondary schools students in Ukwuani LGA, Delta state,

Table 5: Descriptive statistics on the difference between teachers' academic qualifications in the application of the CAI method in teaching secondary schools students in Ukwuani LGA, Delta state

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
NCE	70	1.4795	.50303	.05888	1.3621	1.5968	1.00	2.00
Degree	119	1.4783	.50171	.04679	1.3856	1.5709	1.00	2.00
Post Degree	21	1.5000	.51177	.10911	1.2731	1.7269	1.00	2.00
Total	210	1.4810	.50083	.03456	1.4128	1.5491	1.00	2.00

Table 5 above depicts the descriptive statistic on the difference between teachers' academic qualifications in the application of the CAI method in teaching secondary school students in Ukwuani LGA, Delta state. The table categorises certificates of teachers into NCE, Degree and post-degree. A total of 210 teachers participated in the study. Out of this figure, 70 teachers hold NCE and below, 119 have first degrees and 21 have post-degrees. The mean scores for the NCE, Degree and post-degree are 1.4795, 1.4783 and 1.5000 respectively; with a total mean score of 1.4810.

Table 6: One-way ANOVA statistic on the difference between teachers' academic qualifications in the application of the CAI method in teaching secondary school students in Ukwuani LGA, Delta state

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.009	2	.004	.018	.982
Within Groups	52.415	207	.253		
Total	52.424	209			

The one-way statistics revealed a significant difference between and within groups as shown in Table 6 above with F (.018= df, 2/209, p = .982. The hypothesis which states that there is no significant difference

between teachers' academic qualifications in the application of the CAI method in teaching secondary school students in Ukwuani LGA, Delta state in the study was therefore accepted. A posteriori test was therefore unnecessary since the hypothesis revealed an insignificant difference. The implication is that there are no significant differences between teachers' academic qualifications in the application of the CAI method in teaching secondary school students in Ukwuani LGA, Delta state.

Discussion of Findings

This research study examined teachers' perceived influence of gender and academic qualifications on the application of computer-assisted instruction in secondary schools in Apapa, Lagos. Research Question 1 was: To what extent do teachers apply the CAI method in teaching secondary school students in Ukwuani LGA, Delta state? The outcome of the study revealed that teachers do not readily apply the CAI method in teaching secondary school students in Ukwuani LGA, Delta state. This finding agreed with the viewpoints of Schulmeister (2006) who opined that the advantages of digital learning are not fully exploited since technology is not yet significantly improving the effectiveness of instructions in schools.

Research Question 2 sought to determine the challenges facing the effective application of the CAI method in teaching secondary school students in Ukwuani LGA, Delta state. The findings revealed that the challenges encountered by teachers in the effective application of the CAI method in teaching secondary school students are indeed enormous. This outcome agreed with the finding of Folorunso, Ogunseye, & Sharma (2006) and the findings of Resnick (2002) who implicated low computer literacy level of awareness, poor computer literacy and high cost as factors responsible for non-utilization of digital learning by students and lecturers of Nigerian universities. Arikpo, Osofisan, and Usoro, (2009) are of the view that the cost of accessing the Internet in Nigeria is beyond the reach of most learners.

Hypothesis 1 states: There is no significant difference between male and female teachers in the application of the CAI method in teaching secondary school students in Ukwuani LGA, Delta state. Findings from

the study acknowledge that there was no significant difference between male and female teachers in the application of the CAI method in teaching secondary school students in Ukwuani LGA, Delta state. This outcome agrees with Diane, Camilla, David, Ruben., Shibley, and Morton (2007) who stressed that gender differences in the performance of mathematics and related sciences could be due to differences in interests and intellectual abilities.

The outcome of Hypothesis 2 showed that there are no significant differences between teachers' academic qualifications in the application of the CAI method in teaching secondary school students in Ukwuani LGA, Delta state. This finding agrees with Amede (2016) who stressed that teachers, irrespective of gender, need to improve their academic qualifications.

Implication for Counselling

The findings of this study have far-reaching implications for counselling. Capable and well-trained teachers with computer skills would relieve the workloads of school counsellors. The study would sensitize school counsellors to make appropriate requests for in-service training from the government and school proprietors to improve their capacity. Counsellors should use their lofty positions in the school system to encourage and motivate teachers to undergo professional development in computer skills.

Conclusion

The study examined perceived teachers' gender and academic qualifications in the application of computer-assisted instruction in secondary schools in Ukwuani LGA, Delta state. The outcome of the study revealed that teachers do not readily apply the CAI method in teaching secondary school students in Ukwuani LGA, Delta state. Challenges met by teachers in the effective application of the CAI method in teaching secondary school students in the local government area of Apapa, Lagos are indeed enormous. There is also no significant difference between male and female teachers and between teachers' academic qualifications in the application of the CAI method in teaching secondary school students. However, the government should

allow teachers to attend in-service training and workshops on Computer Assisted Instruction skills for teaching secondary school students.

Recommendations

1. Teachers' should be adequately trained on computer applications to maximize their uses as methods in teaching secondary schools pupil by being adequately trained in computer education. They should be sent for in-service training to acquire computer proficiency.
2. Government should provide computers and related software in schools by either supplying them directly or making financial provisions for school heads to purchase them.
3. Government should provide solutions to the many challenges militating against Computer Assisted Instruction services in schools. This can be achieved by providing enabling environments in schools for teaching and learning with the computer.
4. Government and school proprietors should ensure effective school monitoring to identify and provide solutions to the challenges of Computer Assisted Instruction services in secondary schools by providing enabling environment.
5. Stakeholders in education should de-emphasis gender but emphasise competencies, qualifications and talents in the admission of students and choice of teachers to administer the CAI programme.

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