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ASSESSMENT OF THE LEVEL OF ECONOMICS TEACHER'S AWARENESS OF THE APPLICATIONS OF ARTIFICIAL INTELLIGENCE IN TEACHING AND LEARNING ECONOMICS

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Abstract

This study was conducted to assess teachers' awareness of the applications of artificial intelligence (AI) in teaching. The study adopted a descriptive design. The population comprised 56 teachers in Owerri Education Zone2 of Imo State which were manageable for the study. Thus, there was no sampling since the whole population of teachers in the study area participated in the study. Teachers' Awareness of the application of AI Questionnaire (TAAAITQ) was used as the instrument for data collection. The reliability of the instrument was determined to be 0.89 using Cronbach alpha method. Mean and standard deviation were used to answer research questions while independent samples t-test and ANOVA were used to test hypotheses at 0.05 level of significance. The result showed that teachers have a low level of awareness of applications of AI. Furthermore, it was revealed that gender, experience and qualification do not significantly influence teachers' level of awareness of the applications of AI. Based on findings, it was recommended among others that, the government should organize workshops for the training of teachers on the application of AI in teaching and learning.

Keywords: artificial intelligence, awareness, economics.

Introduction

There is a great worry on the poor performance of secondary school students in the subject economics. Because of the importance of the subject in a nation's economy, researchers developed interest in finding solution to the poor academic achievement in economic. According to Ezeudu and Jolaosho (2021), Economics as a subject can be defined as a social science that deals with production and distribution of goods and services. However, one could say that economics is a social science study which deals with consumption, production and the distribution of goods and services in order to satisfy human want and need. Ezeudu and Jolaosho (2021), stated that the study of economics is very importance because the study of economics permits us to make appropriate decision, economics makes an individual to be rational, it help people to be objective in dealing with live endeavours. The study of economics also enables a nation to be self-sufficient and self-reliance. However, for students to attain these objectives there is need for students to do well in their academic achievement.

Despite the importance of economics to individuals, students and the nation at large, students' academic achievement in recent year has been very poor. The poor academic achievement of students in economics is common in Nigeria, Imo state particularly in Owerri Education Zone 2 of Imo State this is evident in West African examination council chief examiner's report 2020, 2021, 2022 and 2023. Džinović, Đević and Đerić (2019) asserted that academic achievement is the grades used by teachers, schools and examination bodies to explain the level of students' learning outcomes based on the outlined objectives. Academic achievement is the level to which learning have been attained. Baker, (2021) pointed that there is a growing demand that Artificial intelligence should be deployed in teaching and learning as it can help to enhance student's knowledge and academic achievement, particularly in economics. According to Mohamed, Ayanwale, Sanusi, Adelana, Aruleba and Oyelere (2022) Artificial Intelligence is a learning machine that focuses on enabling computer systems to learn and make decisions or predictions based on data, without being explicitly programmed. Yaping, Junjie and Nor (2022) define artificial intelligent as the ability of computers to understand, interpret, and create human language as well as enabling tasks like machine translation, speech recognition and sentiment analysis. Artificial Intelligence could be seen as the development of computer systems that is capable of performing tasks that actually require human intelligence. Most teachers may not be able to apply artificial intelligence in teaching while some are not aware of the existence of artificial intelligence. Teachers' awareness of artificial intelligence represents a combination of artificial intelligence knowledge, understanding, observation and application that enables teachers to effectively meet the needs of their students. Abdulkarim, Nsofor, Tukura and Falode, (2022) viewed Teachers' awareness as the teacher's understanding and sensitivity towards the social, emotional, and cultural needs of their students. Ferikoglu and Akgun (2022) conducted a study on the Investigation of teachers' artificial intelligence awareness: A scale development study. The study was carried out in Bahcesehir University on the findings of the study shows that private schools teachers were found to have more awareness of AI than the teachers in public schools. Another factor that is capable of affecting teachers' awareness is the teachers' qualifications, gender and years of teaching experience. According to Doo, Bonk and Kim (2021) the amount of time a person has spent working as a teachers is called years of teaching experience. Kin and Kim (2022) addressed that years of teaching experience significantly influence teachers' application of artificial intelligence in teaching. Kin and Kim further explained that teachers' educational qualification is an important factor that affect teachers' applications of artificial intelligence in teaching.

Teachers' educational qualification can be defined as the academic training and credentials that a teacher has acquired which qualifies him to teach. Cardoso (2022) stated that educational qualifications of the teachers' does not have any significant effect on the teacher's awareness on the applications of artificial intelligence in teaching. Cardoso (2022) however, describe that gender is a factor which can affect the applications of artificial intelligence. According to Yaping, Junjie and Nor (2022), gender is a social construct that is allocated to people as either male or female. Khanal, Belbase and Joshi (2020) asserted that gender does not significantly influence teachers'

awareness on the applications of artificial intelligence in teaching and learning. Whereas Ayanwale, Sanusi, Adelana, Aruleba, and Oyelere (2022) addressed that gender significantly influences teachers awareness of the applications of artificial intelligence in teaching. This inconsistency and the concepts above created the need for this study.

Purpose of the Study

The purpose of this study was to investigate Economics teachers' awareness of the application of artificial intelligence in teaching and learning Economics. Specifically, the study sought to determine the extent to which;

a) Economics teachers' are aware of the application of artificial intelligence in teaching and learning economics.
b) gender influences mathematics teachers' awareness of the application of artificial intelligence in teaching and learning economics.
c) years of teaching experience influence economics teachers' awareness of the application of artificial intelligence in teaching and learning economics.
d) educational qualification influence economics teachers' awareness of the application of artificial intelligence in teaching and learning economics.

In agreement with the purpose of the study, the following research questions were posed for the study.

1. To what extent are economics teachers aware of the applications of artificial intelligence in teaching and learning economics?
2. To what extent does gender influence economics teachers' awareness of the application of artificial intelligence in teaching and learning economics?
3. To what extent do years of teaching experience influence economics teachers' awareness of the application of artificial intelligence in teaching and learning economics?
4. To what extent does educational qualification influence economics teachers' awareness of the application of artificial intelligence in teaching and learning economics?

In agreement with the research question the following null hypotheses were formulated for the study include.

Ho_1: Gender does not significantly influence economics teachers' awareness of the application of artificial intelligence in teaching and learning economics.

Ho_2: Years of teaching experience do not significantly influence economics teachers' awareness of the application of artificial intelligence in teaching and learning economics.

Ho_3: Educational qualification does not significantly influence economics teachers' awareness of the application of artificial intelligence in teaching and learning economics

Method

The study adopted descriptive research design. Descriptive research design is a design whose objective is to collect and describe data in a systematic manner to ascertain the features, characteristics and facts about a particular phenomena or population that are of interest to the researcher (Nworgu, 2015). This design is appropriate for the study because the researcher have interest in collecting data about the awareness on the application of artificial intelligence and describing the data in a systematic manner. The study was conducted in Owerri Education Zone 2 of Imo state which comprised of 4 Local Government Area; Aboh Mbaise L.G.A, AhiazuMbaise L.G.A, Ezinihitte L.G.A and Ngor-Okpala L.G.A in Imo State. The population of the study comprised of all the 56 senior secondary school II Economics teachers in 2023/2024 academic session in Owerri Education Zone 2 of Imo state. All the 56 Economics teachers from 4 local governments that makes up the zone. The entire population was used because the population is manageable and no need for sampling. The 4 local government in Owerri education zone which were used for the study comprising of 9 male 6 female economics teachers in 15 public secondary schools in Aboh Mbaise, 8 male 5 female in 14 public secondary schools in Ezinihitte, male 4 female 6 in 10 public secondary schools in Ahiazu Mbaise and male 7 female 10 in 17 public secondary schools in Ngor-Okpala. Making a total of 56 economics teachers from Owerri Education Zone 2 of Imo State.

Economics Teachers Awareness on the application of artificial intelligence Questionnaire (ETAAAIQ) was used as instrument for data collection. The instrument contains two sections; sections X and Y. Section X elicited demographic information of the respondents while section Y contains 10 items related on a four-point scale. 4-very high extent, 3-high extent, 2–low extent and 1–very low extent. The instrument was validated by three experts in Measurement and Evaluation from the Department of Science Education, Faculty of Education in University of Nigeria, Nsukka. The instrument (ETAAAIQ) was trial tested on 20 economics teachers from Mbaitolu L.G.A and a reliability estimate of 0.89 was obtained using Cronbach Alpha reliability estimate. In order to get maximum return of instruments, the data was collected on the immediately. The data collected was analyzed using mean and standard deviation while Analysis of Variance and independent sample t-test were used to test the hypotheses at 0.05 level of significant.

Results

Table 1: Mean and standard deviation of the extent are economics teachers aware of the application of artificial intelligence in teaching and learning economics

S/N	ITEM STATEMENTS	N	Mean	Std. Deviation	Remark
1	I have a good knowledge of artificial intelligence tool.	56	2.36	.75	LE
2	I have used AI-powered tools or platforms in your teaching	56	1.98	.67	VLE
3	I believe AI can enhance the teaching and learning experience	56	2.09	.86	VLE
4	I believe AI could support teachers in their roles	56	1.80	.80	VLE
5	I believe AI can improve student engagement	56	1.89	.62	VLE
6	I am aware of any ethical considerations related to AI in education	56	1.73	.70	VLE
7	I believe AI could support teachers in their roles	56	1.96	.81	VLE
8	I stay informed about new developments in AI for education	56	2.29	.89	VLE
9	I believe AI could help reduce the workload for teachers	56	1.86	.77	VLE
10	I have collaborated with AI developers	56	1.77	.63	VLE
	CLUATERMEAN	**56**	**1.97**	**.35**	**VLE**

Table 1 shows the means and standard deviations of the extent are economics teachers aware on application of artificial intelligence in teaching and learning economics**.** For the fact that items 2 to 10 show very low extent (VLE) of teachers' awareness and applications of artificial intelligence in teaching and learning. This implies that economics teachers are not aware of the application of artificial intelligence in teaching and learning economics**.** The grand mean of 1.97 with a standard deviation of 0.35 also shows that economics teachers are not aware of the application of artificial intelligence in teaching and learning economics.

Tale 2: Mean analysis of the influence of gender on economics teachers' awareness of the application of artificial intelligence in teaching and learning economics

Gender	N	MEAN	SD	Df	t-value	Sig.(2-tailed)
Male	32	1.95	0.36	54	0.80	0.62
Female	24	2.00	0.33			

Table 2 above shows the mean and standard deviation on the extent gender significantly influence economics teachers' awareness of the application of artificial intelligence in teaching and learning economics. The table indicates the mean of 1.95 with standard deviation of 0.36 for male and 2.00 with standard deviation of 0.33 for females. Therefore, the table shows that there are differences in the means and standard deviation but the means and standard deviations differences are not significant.

Table 2 above shows the mean and standard deviation on the extent gender significantly influence economics teachers' awareness of the application of artificial intelligence in teaching and learning economics. The table indicates the mean of 1.95 with standard deviation of 0.36 for male and 2.00 with standard deviation of 0.33 for females. Therefore, the Table shows that there are differences in the means and standard deviation of male and female teachers. The result also indicated a t-value of 0.80 with Sig. (2-tailed) of 0.62 hence the hypothesis was not rejected. This implies that gender does not have any significant influence on economics teachers' awareness of the application of artificial intelligence in teaching and learning.

Table 3: ANOVA for the influence of years of teaching experience economics teachers' awareness of the application of artificial intelligence in teaching and learning economics

Years of teaching Experience	N	Mean	Std. Deviation
0 to 5 yrs	27	1.94	.32
6 to 10yrs	21	1.95	.37
11 and above	8	2.20	.40
Total	56	2.00	.35

The result in Table 3 shows that economics teachers from 0 to 5 years of teaching experience had 1.94 mean with 0.32 standard deviation, but teachers within 6 to 10 years teaching experience had 1.95 mean and 0.37 standard deviation while teachers from 11 years teaching experience had 2.20 mean with 0.40 standard deviation and a total mean of 2.00 with a standard deviation of 0.35.

Table 4: ANOVA for the influence of years of teaching experience on economics teachers' awareness of the application of artificial intelligence in teaching and learning economics

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.292	2	.146	1.196	.311
Within Groups	6.478	53	.122		
Total	6.770	55			

Result in Table 4 shows that Years of teaching experience do not significantly influence economics teachers' awareness of the application of artificial intelligence in teaching and learning economics, F (1,53) = 1.196, p = .311) because the p-value of .311 is greater than 0.05 level of significance stated in this study, the null hypothesis is accepted. Therefore, the researcher concludes that Years of teaching experience do not significantly influence economics teachers' awareness of the application of artificial intelligence in teaching and learning economics.

Table 5: Mean analysis of the influence of educational qualification on economics teachers' awareness of the application of artificial intelligence in teaching and learning economics

Educational Qualification	N	Mean	Std. Deviation
NCE/OND	21	1.98	.34
BSC/HND	15	1.89	.33
MASTER	11	1.96	.37
PHD	9	2.10	.40
Total	56	1.97	.35

The result in Table 5 shows that economics teachers whose educational qualification are NCE/OND had 1.98 mean with 0.34 standard deviation, but teachers with BSC/HND had 1.89 mean and 0.33 standard deviation while teachers that are masters holder had 1.96 mean with 0.37 standard deviation while teachers that are PhD holder had 2.10 mean with 0.40 standard deviation and a total mean of 1.97 with a standard deviation of 0.35.

Table 6: ANOVA for the influence of educational qualification on economics teachers' awareness on the application of artificial intelligence in teaching and learning economics

Educational Qualification	Sum of Squares	df	Mean Square	F	Sig.	decision
Between Groups	.243	3	.081	.644	.590	Do not reject Ho
Within Groups	6.427	52	.126			
Total	6.770	55				

Result in Table 6 shows that Educational qualification does not significantly influence economics teachers' awareness on the application of artificial intelligence in teaching and learning economics, F (3,52) = 0.644, p = .590) since the p-value of .590 is greater than .05 level of significance stated in this study, the null hypothesis is accepted. Therefore, the researchers concludes that educational qualification of teachers does not significantly influence economics teachers' awareness of the application of artificial intelligence in teaching and learning economics.

Discussion

The findings of this study show that teaching experience, educational qualifications and gender do not have any significant influence in teaching. The findings of this study is in consonant with the findings of Chiu and Chai (2020) who pointed out that years of the teachers' experience does not significantly affect teacher awareness and applications of artificial intelligence in teaching and learning. The findings of this study is in agreement with the findings of Kin and Kim (2022) who addressed that years of teaching experience does not significantly influence teachers' application of artificial intelligence in teaching. The findings of this study are also in line with the study conducted by Cardoso (2022) who find out that educational qualifications of the

teachers' do not have any significant effect on the teachers awareness on the applications of artificial intelligence in teaching. Again Uygun (2024) that pointed out that level of education of the teacher does not significantly influence teachers' awareness and application of artificial intelligence in teaching and learning. Furthermore, the finding of this study is in consonant with the findings of Khanal, Belbase and Joshi (2020) who asserted that gender does not significantly influence teachers' awareness of the applications of artificial intelligence in teaching and learning. However, the findings of this study disagree with the findings of Ayanwale, Sanusi, Adelana, Aruleba, and Oyelere (2022) that gender significantly influences teachers' awareness of the applications of artificial intelligence in teaching. However, the findings of this study are in line with the study carried out by Uygun (2024) who addressed that there is no significant effect of gender on the awareness and the application of artificial intelligence in teaching and learning.

Conclusion

The study shows that teachers have very low awareness and applications of artificial intelligence in teaching and learning. Furthermore, teaching experience was found to have no significant effect on teachers' awareness and application of artificial intelligence in teaching and learning. The study also shows that educational qualifications and gender do not have any significant influence on the awareness and the applications of artificial intelligence in teaching and learning. Therefore, one can conclude that if teachers are aware of the application of artificial intelligence in teaching and learning students' academic achievement will improve and teachers as well as educational objective will be attained.

Recommendations

1. The government should organize in-service training on artificial intelligence for teachers
2. Principals should encourage teachers to apply artificial intelligence in teaching.
3. Female and male teachers of any educational qualification should be taught AI
4. Despite the level of teachers' experience he/she should be taught how to apply AI tools

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