UNIJERPS
Unizik Journal of Educational Research and Policy Studies VOL.16 (1);
https://unijerps.org
2021 Impact Factor: 5.641; 2020 Impact Factor: 5.355.
July-December, 2023
Indexing and Impact Factor URL: http://sjifactor.com/passport.php?id=21363

VIRTUAL TEACHING-LEARNING FACTORS AND STUDENTS' ATTITUDE TO LEARNING IN TERTIARY INSTITUTIONS IN OYO STATE.

Samuel Oroghenemudiake Ukutegbe & **Dr. Olayemi Jumoke Abiodun-Oyebanji**
E-mail: samukutegbe@gmail.com; 07034332603;
E-mail: olayemi.oyebanji@yahoo.com 08156485841

Department of Educational Management, University of Ibadan, Nigeria.

And
Prof. Senimetu Esther Ileuma
E-mail: ileumaesther@gmail.com; 08038047958
Department of Arts and Social Sciences Education,
Lead City University, Ibadan.

ABSTRACT

The study investigated virtual teaching-learning factors (technology, technical know-how and economic status) and students' attitude to learning in the tertiary institutions (public and private) of Oyo State. Descriptive research design of the survey type was adopted. Three null hypotheses were formulated to guide the study. A total of 610 undergraduates students were selected from five tertiary institutions through multi-stage sampling technique. A validated questionnaire vetted by experts in measurement and research was used as an instrument for data collection. Using the Cronbach's Alpha, the result of the reliability test of the instrument was determined to be 0.78. The data collected were analyzed using inferential statistics. Hypothesis one was tested using Correlation Matrix. Hypotheses two and three were tested using Multiple Regression Analysis at a 0.05 level of significance. The study revealed that there is a significant relationship between virtual teaching-learning factors and students' attitude to learning. It also showed that there are significant relative contributions of virtual teaching-learning factors towards students' attitude to learning in tertiary institutions in Oyo state. The results further revealed that there is significant joint contribution(s) of Virtual Teaching-Learning factors towards students' attitude to learning in tertiary institutions in Oyo state. Based on these findings, the researchers recommended that there is the need for the authorities and stakeholders of tertiary institutions to ensure hitch-free use of computer and internet for virtual teaching-learning to take place so that it can bring its benefits to the students as well as stimulates students' critical thinking for improved academic performance.

Keywords: Economic status, Students' attitude, Technical know-how, Technology, Virtual teaching-learning.

Introduction

An attitude is an opinion or feeling about a person, object, situation or problem either positive or negative. It is developed through direct experiences, social influence, or media exposure and is built on three pillars of emotions, behaviour, and cognition. In line with the foregoing, Bakanauskas, Kondrotienė, and Puksas (2020) posited that attitude is related to personal experience and is formed through personal experience and evolves from positive or negative experiences (cognitive aspect) associated with the specific object being assessed to which the attitude is expressed. The cognitive component includes an individual's knowledge, beliefs and perceptions about the object of an attitude, acquired through direct experience of that object and the evaluation of new incoming and old available information, expressing an evaluation of an object with a certain emotional reaction, a certain favourability or unfavourability.

In the school system, students' attitude to learning is a key factor in achieving the goals of education. It is also a key element of fostering more and better learning that improves their performance in internal and external examinations. Over the years, poor students' attitude to learning in the tertiary institutions in Nigeria is one of the problems that is increasingly challenging the school system which has resulted in poor performances in examination and also led to consequent production of sub-standard graduates. The poor attitude of students to learning in the tertiary institutions is exhibited in the form of irregular class attendance, poor study habits in terms of poor reading culture, truancy and refusal to do class work or assignments as well as lack of interest to learn in the case of class participation or listening attentively to teachers in classrooms. The instance of students with consistent negative attitudes to learning as a result of peer influence can instigate or bring other students into the same emotional state, disrupt classes, and put a serious drain on teachers' emotional health and attention thereby making it difficult to achieve the objectives of the planned academic activities. The attitudes that learners hold towards schoolwork more often than not influence their intentional behaviors and commitment towards their studies (Chata, Kangumu and Abah, 2019).

To deal with student attitudes can pose a challenging experience for educators. Students with negative attitudes find it difficult to succeed in school activities hence they cannot advance academically. The negative attitude of students in schools also keeps students behind from attaining their actual potential abilities but dealing with minor attitudes of students before they grow into bigger issues requires pragmatic skills of suppressing your feelings and employing workable methods to stop the behaviour as educators with experience. It should be noted that a positive attitude is a powerful tool that fosters enthusiasm, promotes self-esteem, and creates an atmosphere conducive to learning. Achievement in educational targets or objectives relies not only on intellectual capacity, but also on the learner's attitudes to learning. Attitudes could be viewed as a tendency to respond positively or negatively towards a certain thing, idea, person,

situation etc. In agreement with the above statement, Orunaboka (2011) emphasized that "attitudes are formed by people as a result of some kinds of learning experience, if the experience is favourable, a positive attitude is found and vice versa. The attitude people hold can frequently influence the way they act in person and larger situation. For this reason, educationists, researchers, administrators, psychologists and sociologists are concerned with attitude development, how they affect behavior and how they can be changed''. Moreover, Musengimana .Kampire and Ntawiha (2021) in their study to investigate the common factors affecting students' attitudes toward chemistry found out that factors such as instructions methods, teaching aids and availability of infrastructure, students' interest, classroom environment, gender, grade level, teachers' behaviors or characteristics, social, environmental factors that (include parent, peers, friends, socio-economic class, and social-cultural context), perceived difficulty of science/chemistry or how science is perceived, and self- directed effort were found to affect attitudes of students toward the subject positively. The curriculum's relevance negatively affected students' attitudes, and few studies showed no effect. Similarly, Uden, Sulaiman and Lamun (2022) in their study titled *Factors Influencing Students' Attitudes and Readiness towards Active Online Learning in Physics* which was set out to investigate if the four factors, computer skills, learning preferences, prior knowledge, and motivation, affect students' attitudes toward their active online learning in physics. The two phases of the study showed that students' attitudes changed in the post-implementation phase. During the pre-implementation phase, students considered learning preferences and motivation as the two factors that they believed would affect their learning. However, after the implementation, their attitudes changed. Post-implementation findings showed that all the four factors were important. This is not a surprise because computer skills are necessary to enable students to carry out online learning tasks. Students without these skills would have to learn them and they would be distracted from the learning of the subject.

The 21st century has brought about a massive change in the world of education. Gone are those days when teaching and learning were limited only within the confines of a classroom. The internet has brought about a paradigm shift in the fundamental way in which learning is done. It has taken learning beyond the hallowed walls of the universities and into the palms of everyone (Sarkar, 2020). The importance of virtual teaching-learning cannot be overemphasized in this modern age. In recognition of this fact, Caprara and Caprara (2021) stated that educators are increasingly turning to digital online tools and resources to supplement and enhance their teaching in the classroom. Independent of the move to online learning as a result of the COVID-19 pandemic, there is a clear upward trend to the prevalence and variety of online learning opportunities available to students of all ages. Meyer (2020) strongly advocated for and recommended virtual teaching-learning for both teachers and students as a result of the following reasons: Virtual learning is not

"extra" or "same thing, but online." It is a "different learning experience." An important distinction is that the term "virtual teaching-learning" is not a traditional classroom activity moved online; rather, it is a learning experience integrated within the curriculum that is specifically designed to be experienced online. It lives online regardless of whether a classroom is face-to-face or remote. Students engage in core learning processes and outcomes in a virtual teaching-learning instructional sequence, which will require different types of computer technologies.

However, Eze., Chinedu-Eze, Okike and Bello (2020) in their study which explored factors influencing the use of e-learning by students in private Higher Educational Institutions in Nigeria using Technology-Organisation-Environment (TOE) framework, came up with the findings which revealed that technology-related factors (ease of use, speed accessibility and service delivery), organisation-related factors (training support and diversity), environment-related factors (attitudes of the users) and impact-related factors (learning experience, skill development, academic performance, and degree of engagement) influence the students' adoption of e-learning facilities.

Furthermore, Pokhrel and Chhetri (2021) noted the importance of virtual teaching and learning process during the COVID-19 pandemic which was characterized by lockdown and stay-at-home policies in which E-learning tools played a crucial role during the pandemic in helping schools and universities to facilitate students' learning during the closure of universities and schools. They pointed out that, while adapting to the new changes, staff and student readiness needs to be gauged and supported accordingly. The learners with a fixed mindset find it difficult to adapt and adjust, whereas the learners with a growth mindset quickly adapt to a new learning environment since there is no one-size-fits-all pedagogy for virtual teaching-learning. Almahases, Mohsen and Amin (2021) corroborated that the benefits were mainly self-learning, low costs, convenience, and flexibility. It should be noted that technology is the product of the reflection of learning competence, which is one of the basic characteristics of human beings on the problem solving process. It is a fact that technology is pervasive and intertwined in many aspects of modern life and society. The digital revolution that is sweeping the world today has registered its importance in all areas of human endeavor and it is not out of place that it has begun to infiltrate the realm of education. Technology is rapidly transforming the way students learn, and as a result, it is expected to improve the face of education by making it more inexpensive and accessible to all learners and intending ones (Meral 2019, Capara and Capara 2021 and Haleem et al 2022).

Despite the good number of tertiary institutions in Oyo state with adequate number of students, the attitude of students to learning seems to be responsible for the poor performance of the students in both internal and external examinations. This factor also has adverse effect on the quality of their skills, knowledge and competencies needed by employers of labour in the present

Nigerian economy. Some researchers' works have attested to the aforementioned problem. It is also a pointer to the fact that this could be caused by some debatable factors such as student's upbringing, parental background, socio-economic status, teachers' skills, environment and peer group influence to mention but a few. Meanwhile, as a result of the Information Communication Technology (ICT) era we found ourselves, it is imperative to note that there is a dire need to investigate how virtual teaching-learning can be used to influence the tertiary students' attitude to learning in order to bring about positive behavioural change(s). This would go a long way to complement the emergence of internet technology which has brought profound growth in the virtual teaching-learning culture of tertiary institutions in many countries. Adversely, it is very unfortunate that most Nigerian tertiary institutions and their students are yet to fully embrace and implement these virtual teaching-learning opportunities beckoning them. It is against this background that this study investigated how virtual teaching-learning can be applied meaningfully to improve students' attitude to learning in tertiary institutions in Oyo state. To this end, the study specific objectives are:

i. To find out if there is any significant relationship between virtual teaching-learning factors (technology, technical know-how and economic status) and students' attitude to learning in tertiary institutions in Oyo State.

ii. To find out the relative contributions of virtual teaching-learning factors (technology, technical know-how and economic status) to students' attitude to learning in tertiary institutions in Oyo State.

iii. To find out the joint contributions of virtual teaching-learning factors (technology, technical know-how and economic status) towards students' attitude to learning in tertiary institutions in Oyo State.

Statement of the problem

Students' attitude to learning is paramount to attainment of educational objectives. However, it is appalling to note that poor or negative students' attitude to learning in tertiary institutions in recent times has caused high rate of poor performances in both internal and external examinations as well as other academic activities. This manifests in lack of interest to learn, irregular class attendance or poor study habits which often leads to production of half-baked or sub-standard graduates that cannot contribute meaningfully their quotas to societal growth. This factor has also adversely affected the quality of their skills, grades, knowledge and competencies expected of them after graduation. The ICT revolution makes it imperative to note the need of complementing the emergence of internet technology which has instigated meaningful development of virtual teaching-learning culture in many tertiary institutions worldwide while yielding positive attitudinal changes among students. Sadly, it is very unfortunate that most Nigerian tertiary institutions and their students have not fully adopted these virtual teaching-learning culture and opportunities. This study hereby investigated the virtual teaching-learning factors and students' attitude to learning in tertiary institutions in Oyo state as well as the relationships, contributions and applications of the independent variable(s)

geared towards ensuring positive attitude to learning.

Hypotheses

The following null hypotheses which further guided the study were tested at 0.05 levels of significance:

Ho_1: There is no significant relationship between virtual teaching-learning factors (technology, technical know-how and economic status) and students' attitude to learning in tertiary institutions in Oyo state.

Ho_2: There is no significant relative contributions of virtual teaching-learning factors (technology, technical know-how and economic status) and students' attitude to learning in tertiary institutions in Oyo state.

Ho_3: There is no significant joint contribution(s) of virtual teaching-learning factors (technology, technical know-how and economic status) towards students' attitude to learning in tertiary institutions in Oyo State.

Research Method

The Research design adopted for this study is a survey research design. The population of the study comprised the undergraduate students of the twenty nine (29) tertiary institutions in the three senatorial districts of Oyo state. That is, students at first year (100 level) to final year in the universities, Colleges of Education, Polytechnics, Monotechnics and Specialized Institutions.

The sample for the study comprised 610 students who are undergraduates in tertiary institutions across the three senatorial districts of Oyo State, Nigeria at the time of this study. The aforementioned figure was made up of 283 males and 327 female learners selected from five tertiary institutions. A multistage sampling technique (total enumeration, stratified, purposive and simple random sampling techniques) was used to select five tertiary institutions from the three senatorial districts in which two were selected from Oyo South, two from Oyo central and one from Oyo North being the only tertiary institution in that senatorial district to get the representative sample. Data were gathered through primary source via the questionnaire. The questionnaire titled **"***Virtual Teaching-Learning Factors and Students' Attitude to Learning in Tertiary Institutions in Oyo State" (VTLFSALTIOSQ)* which contained forty (40) items was used to elicit information from the targeted respondents. To ensure the validity of the instrument, the draft questionnaire was presented to the research experts from Arts and Social sciences Department and Guidance and Counselling Department in the Faculty of Education, University of Ibadan. Useful suggestions and corrections were made and effected on the instrument so as to improve the quality of the validity of the questionnaire. In ensuring the reliability of the items in the instrument, using the Cronbach's Alpha, the result of the reliability test of the instrument (VTLFSALTIOSQ) was determined to be 0.78 where 0.7 and above was regarded as excellent according to Cohen, Manion and Morrison (2009) as cited by Van Wyk (2012). The data collected in this study were analyzed using inferential statistics. Inferential statistics of Pearson's Product Moment Correlation Coefficient (PPMC) was used to test hypotheses 1 and 2 while hypothesis 3 was tested with Multiple Regression Analysis. The analyses for the

hypotheses above were carried out at a level of significance $p < 0.05$.

Presentation of Results

Hypothesis one: There is no significant relationship between virtual teaching-learning factors (Technology, technical know-how and economic status) and students' attitude to learning in tertiary institutions in Oyo state.

Table 1 Correlation matrix showing relationship among the variables of Virtual Teaching-Learning Factors (Technology, technical know-how and economic status) and Students' Attitude to Learning in Tertiary Institutions in Oyo state.

Variables	Students' attitudes	Technology Factor	Economic Status Factor	Technical Know-how Factor
Students' attitudes	1			
Technology Factor	0.579** 0.000	1		
Economic Status Factor	0.173** 0.000	0.487** 0.000	1	
Technical Know-how Factor	0.280** 0.000	0.504** 0.000	0.610** 0.000	1
Mean	33.6131	26.6590	19.8689	29.1082
Standard Deviation	4.27938	2.42763	3.40035	6.03314

****denotes correlation is significant at the 0.05 level**

Table 1 shows the result of hypothesis 1 testing for the relationship among the variables of Virtual Teaching-Learning Factors (Technology, technical know-how and economic status) and Students' Attitude to Learning in Tertiary Institutions in Oyo state. The mean value for technology factor and students' attitude to Learning are given as 26.66 and 33.61 respectively; the standard deviation of technology factor is 2.43 and that of students' attitude to learning is 4.28 2.80; r is 0.579 and p-value is given as 0.000. The result shows that there is significant relationship between technology factor and students' attitude to Learning as p-value < 0.05. The positive r value (r = 0.579) indicates a direct relationship between technology factor and students' attitude to Learning, that is as technology factor increases students'' attitude to learning increases also. Based on what the result shows, there is significant relationship between technology factor and students'

attitude to Learning in tertiary institutions in Oyo State, Nigeria.

The result in table 1 also shows the testing for the relationship between economic status factor and students' attitude to learning in tertiary institutions in Oyo State. The mean value for economic status factor is given as 19.87 and for students' attitude to learning is given as 33.61; the standard deviation of economic status factor is 3.40 and that of students' attitude to learning is 4.28; r is 0.173 and p-value is given as 0.000. The result indicates that there is significant relationship between economic status factor and students' attitude to Learning as p-value < 0.05. The positive r value (r =0.173) indicates a direct relationship between economic status factor and students' attitude to learning, that means as economic status factor improves students' attitude to learning improves also. Based on what the result shows, there is significant relationship between economic status factor and students' attitude to Learning in tertiary institutions in Oyo State, Nigeria.

Table 1 further shows the result of the testing for the relationship between technical know-how factor and students' attitude to learning. The mean value for technical know-how factor is given as 29.11 and that of students' attitude to learning is 33.61; the standard deviation of technical know-how factor is 6.03 and that of students' attitude to learning.is 4.28; r is 0.28 and p-value is given as 0.000. The result shows that there is significant relationship between technical know-how factor and students' attitude to learning as p-value < 0.05. The positive r value indicates a positive relationship between technical know-how factor and students' attitude to learning in tertiary institutions in Oyo state which means as technical know-how factor increases, students' attitude to learning increases. Generally, table 1 reveals that significant direct relationship exist among the variables of virtual teaching-learning factors (technology, technical know-how and economic status) and students' attitude to learning in tertiary institutions in Oyo state, Nigeria. Based on the results, Hypothesis 1 is therefore rejected.

Hypothesis Two (Ho2): There is no significant relative contributions of virtual teaching-learning factors (Technology, technical know-how and economic status) and students' attitude to learning in tertiary institutions in Oyo state.

Table 2: Summary of Multiple Regression Analysis Showing Relative Influence of the Explanatory Variables on Students' Attitudes.

Model	Unstandardized Coefficients		Standard Coefficients			
	Beta (β)	Std. Error	Beta (β)	T	Sig.	Remark
1 (Constant)	6.993	1.553		4.503	.000	S
Technology factor	1.109	.069	.629	16.068	.000	S
Economic status Factor	-.223	.054	-.177	-4.140	.000	S
Technical Know-how Factor	.050	.031	.071	1.642	.101	NS

a. Dependent Variable: Students' Attitude. Note: S = Significant at p<0.05; NS = Not Significant at p>0.05

Table 2 shows the three virtual teaching-learning factors with their unstandardized regression weights and corresponding standard errors, Beta (β) coefficients and t-values. It reveals that technology factor has the highest significant influence on students' attitudes to learning in tertiary institutions in Oyo State (β=0.629; t=16.07; p <0.05). The economic status factor has a very weak and negative relationship (β=-0.177). Though, it has a significant relative influence on students attitudes to learning in tertiary institutions as its p=0.000 (β= -0.177; t= -4.14; p < 0.05). These two factors (technology factor and economic status factor) were found to be significant .But technical know-how factor, p > 0.05) has a very weak and positive relationship (β=0.071), has no significant relative influence on students'' attitudes to learning in tertiary institutions as its p=0.101 (β=0.071; t=1.64; p > 0.05). The implication of this is that the explanatory variables could be adjudged to be quite relevant in determining students' attitudes to learning in tertiary institutions in Oyo state, Nigeria. Since two out of the three virtual teaching-learning factors are significant at p<0.05, as shown in Table.2, hypothesis 2 was therefore rejected. This implies that, virtual teaching-learning factors have significant relative influence on students' attitudes to learning in tertiary institutions in Oyo State. Nigeria.

Hypothesis Three (Ho3): There is no significant joint contributions of Virtual Teaching-Learning factors (Technology, technical know-how and economic status) towards students' attitude learning in tertiary institutions in Oyo State.

Table 3: Summary of Multiple Regression Analysis Showing Joint Contributions of Virtual Teaching-Learning Factors (Technology, Technical know-how and Economic Status) towards Students' Attitude to Learning in Tertiary Institutions

Model Summary					
R	.365[a].				
R Square	0.133				
Adjusted R Square	0.132				
Standard Error of the Estimate	3.98699				
a. Predictors (constant), Students' attitude					
ANOVA					
Model	**Sum of Squares**	**Df**	**Mean Squares**	**F**	**Sig.**
Regression	1487.854	1	1487.854	93.599	.000[b]
Residual	9664.841	608	15.896		
Total	11152.695	609			
a. Dependent Variable: Students' Attitude;					
b. Predictors: (Constant), Virtual Teaching-Learning Factors.					
Level of Significance= 0.05					

Table 3 presents the analysis of hypothesis 3 testing for the joint influence of virtual teaching-learning factors (technology, technical know-how and economic status) on students' attitude to learning in tertiary institutions in Oyo state. The model summary shows an R Square value of 0.133. This means that 13.3% of the total variance in students' attitude to learning in tertiary institutions in Oyo State, Nigeria is attributed to the joint influence of all virtual teaching-learning factors. The Analysis of Variance (ANOVA) shows that the F-test is significant ($F_{(1, 609)} = 93.599$; $p < 0.05$).

Table 3 reveals that the independent variables (virtual teaching-learning factors) jointly influence the dependent variable (students' attitude) (R= 0.365). This led to the fact that the independent variable accounted for 13.2% of the total variance in the students' attitude to learning in tertiary institutions in Oyo State (Adjusted $R^2 = 0.132$). This indicates that the independent variable (virtual teaching-learning factors) and the dependent variable (students' attitude to learning) have linear and significant relationship.

This joint contribution is shown to be statistically significant ($F_{(1, 609)} = 93.599$; $p < 0.05$), therefore the hypothesis is rejected. This implies that there are joint contributions of virtual teaching-learning factors (technology, technical know-how and economic status) towards students' attitude to earning in tertiary institutions**.** Based on this result, hypothesis 3 was rejected.

Discussion of Results

The results revealed that technology factor has the highest significant influence on

students' attitudes to learning in tertiary institutions in Oyo State (β=0.629; t=16.07; p <0.05). This is in line with the findings of Pilli, Fanaeian and Al-Momani (2014) in their study that as technology becomes more integral to the function of educational organizations as whole, the ability of students to integrate a new technology into their learning process becomes an ever-larger determinant of success. This advancement in technology affected the educational environment and helped to develop Electronic learning (E-learning) as a new learning paradigm. This is also line with the views of Geladze (2015) who asserted that using computers and the internet technology makes the learning process more interesting and diverse and leads to increase in cognitive activity.

The economic status factor has a very weak and negative relationship (β=-0.177). Though, it has a significant relative influence on students attitudes to learning in tertiary institutions as its p=0.000 (β= -0.177; t= -4.14; p < 0.05). These two factors (technology factor and economic status factor) were found to be significant .But technical know-how factor, p > 0.05) has a very weak and positive relationship (β=0.071), has no significant relative influence on students'' attitudes to learning in tertiary institutions as its p=0.101 (β=0.071; t=1.64; p > 0.05). The implication of this is that the explanatory variables could be adjudged to be quite relevant in determining students' attitudes to learning in tertiary institutions in Oyo state, Nigeria. Since two out of the three virtual teaching-learning factors are significant at p<0.05, as shown in Table 2, hypothesis 2 was therefore rejected. This implies that, virtual teaching-learning factors have significant relative influence on students' attitude to learning in tertiary institutions in Oyo State. Nigeria. This is in agreement with Usha and Dhanalakshmi (2022) who stated that computer literacy appears to be influenced by student background (economic status) , including familiarity with computers, as well as the emphasis placed on it in classrooms and schools and the support provided by ICT in education systems.

The result of the study also shows the testing for the relationship between economic status factor and students' attitude to learning in tertiary institutions in Oyo State. The mean value for economic status factor is given as 19.87 and for students' attitude to learning is given as 33.61; the standard deviation of economic status factor is 3.40 and that of students' attitude to learning is 4.28; r is 0.173 and p-value is given as 0.000. The result indicates that there is significant relationship between economic status factor and students' attitude to Learning as p-value < 0.05. The positive r value (r =0.173) indicates a direct relationship between economic status factor and students' attitude to learning, that means as economic status factor increases students' attitude to learning increases also. Based on what the result shows, there is significant relationship between economic status factor and students' attitude to Learning in tertiary institutions in Oyo State, Nigeria. This in agreement with Finau (2021) who emphasized that low socio-economic status (SES) affects the cognitive development of children leading to

disadvantages in the classroom as they progress through school. This is also in line with the study of Abduh, Purwanta and Hermanto (2023) which emphasized that due to the rapid development and dynamics of education, parents are becoming increasingly focused and concerned about their children's education. Parents have a significant influence on students' academic performance based on various perspectives, one of which is socioeconomic status (SES).

The findings further shows the result of the testing for the relationship between technical know-how factor and students' attitude to learning. The mean value for technical know-how factor is given as 29.11 and that of students' attitude to learning is 33.61; the standard deviation of technical know-how factor is 6.03 and that of students' attitude to learning.is 4.28; r is 0.28 and p-value is given as 0.000. The result shows that there is significant relationship between technical know-how factor and students' attitude to learning as p-value < 0.05. The positive r value indicates a positive relationship between technical know-how factor and students' attitude to learning in tertiary institutions in Oyo state that is, as technical know-how factor increases, students' attitude to learning improves. This in line with the study of Li and Lee (2016) which stated that computer literacy is the basic condition for technology **l**earning environment. Amimi and Oluyide (2020) corroborated that the distance learning students of the National Open University of Nigeria showed competencies in the use of ICT to deepen knowledge.

Generally, the result reveals that significant direct relationship exist among the variables of virtual teaching-learning factors (technology, technical know-how and economic status) and students' attitude to learning in tertiary institutions in Oyo state, Nigeria. This in agreement with Boca (2021) who posited that more universities are adopting coherent strategies for integrating technology into the educational process and the media used in both internal and external communication tend to migrate to online.

On the significant joint influence of virtual teaching-learning factors (technology, Technical Know-how and Economic status) and students' attitude to learning was tested on students in tertiary institutions in Oyo state, the results revealed that a significant mutual relationship of the explanatory variables on attitudes of students to learning. This in agreement with the findings of Anghelache (2012) which pointed out that there is a statistically significant interrelationship between attitude, performance (technical know-how) and the other factors.

The finding further showed the three virtual teaching-learning factors with their unstandardized regression weights and corresponding standard errors, Beta (β) coefficients and t-values. It reveals that technology factor has the highest significant influence on students' attitudes to learning in tertiary institutions in Oyo State (β=0.629; t=16.07; p <0.05). This in line with Rhema and Miliszewska (2014) who posited that student attitudes towards learning have been identified as critical to the success of e-

learning such that in developing countries the most significant factors were related to increasing technology awareness and improving attitude toward e-learning, enhancing basic technology knowledge and skills, improving learning content, requiring computer training, motivating users to utilise e-learning systems, and requiring a high level of support from the university. The economic status factor has a very weak and negative relationship (β=-0.177). Though, it has a significant relative influence on students attitudes to learning in tertiary institutions as its p=0.000 (β= -0.177; t= -4.14; $p < 0.05$). These two factors (technology factor and economic status factor) were found to be significant .But technical know-how factor, $p > 0.05$) has a very weak and positive relationship (β=0.071), has no significant relative influence on students'' attitudes to learning in tertiary institutions as its p=0.101 (β=0.071; t=1.64; $p > 0.05$). The implication of this is that the explanatory variables could be adjudged to be quite relevant in determining students' attitudes to learning in tertiary institutions in Oyo state, Nigeria. Since two out of the three virtual teaching-learning factors are significant at $p<0.05$, as shown in Table 2, hypothesis 2 was therefore rejected. This implies that, virtual teaching-learning factors have significant relative influence on students' attitudes to learning in tertiary institutions in Oyo State. Nigeria.

The study also presents the result of the analysis of hypothesis 3 testing for the joint influence of virtual teaching-learning factors (technology, technical know-how and economic status) on students' attitude to learning in tertiary institutions in Oyo state. The model summary shows an R Square value of 0.133. This means that 13.3% of the total variance in students' attitude to learning in tertiary institutions in Oyo State, Nigeria is attributed to the joint influence of all virtual teaching-learning factors. The Analysis of Variance (ANOVA) shows that the F-test is significant ($F_{(1, 609)} = 93.599$; $p < 0.05$). This findings reveals that the independent variables (virtual teaching-learning factors) jointly influence the dependent variable (students' attitude) (R= 0.365). This led to the fact that the independent variable accounted for 13.2% of the total variance in the students' attitude to learning in tertiary institutions in Oyo State (Adjusted R^2 = 0.132). This indicates that the independent variable (virtual teaching-learning factors) and the dependent variable (students' attitude to learning) have linear and significant relationship. This is supported by Falode, Chukwuemeka and Mohammed (2020) who asserted that the use of technology tools in teaching and learning is bringing significant changes in ways teachers conceive, organize instruction, and evaluate their students as well as ways in which learners learn as well as advances in educational technology have transformed systems of communication and lesson ideas; teachers' professional development and expedite resourcefulness; learning resources, and learning efficiency.

This joint contribution is shown to be statistically significant ($F_{(1, 609)} = 93.599$; $p < 0.05$. This implies that there are joint contributions of virtual teaching-learning factors (technology, technical know-how and economic status) towards students' attitude to earning in tertiary institutions**.** This is in

synergy with Racheva (2017) who stated that the benefits derived from virtual learning which include: remote access to an unlimited array of educational services (topics and tutors) offered worldwide; individualized learning process that takes into consideration the personal level of competence, individual needs, and different learning styles; safe and secure learning environment; flexible learning in terms of time, location, and pace; cost-effectiveness, time-effective, easily scalable and much more.

Conclusion

In the light of the findings of the study, it could be concluded that:

1. There are joint contributions of virtual teaching-learning factors (technology, technical know-how and economic status) towards students' attitude to learning in tertiary institutions in Oyo state, Nigeria. .
2. There is a significant mutual relationship of the explanatory variables on attitudes of students to learning in tertiary institutions in Oyo state, Nigeria.
3. The technology factor has the highest significant influence on students' attitudes to learning in tertiary institutions in Oyo State (β=0.629; t=16.07; p <0.05).
4. The economic status factor has a very weak and negative relationship (β=-0.177). Though, it has a significant relative influence on students' attitudes to learning in tertiary institutions in Oyo state..
5. The technical know-how factor has a very weak and positive relationship (β=0.071), but it has no significant relative influence on students' attitudes to learning in tertiary institutions in Oyo state.
6. There is a direct relationship between economic status factor and students' attitude to learning. That means, as economic status factor increases students' attitude to learning improves also.
7. There is a positive relationship between technical know-how factor and students' attitude to learning in tertiary institutions in Oyo State. That is, as technical know-how factor increases, students' attitude to learning improves.

Generally, the result reveals that significant direct relationship exist among the variables (indices) of virtual teaching-learning factors (technology, technical know-how and economic status) and students' attitude to learning in tertiary institutions in Oyo state, Nigeria.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. The importance of virtual teaching-learning cannot be overemphasized in this technology-driven 21st century. Hence, the leadership and stakeholders of all tertiary institutions should compulsorily make adequate preparation and provision for virtual teaching-learning to take place as the need arises because it provides new opportunities for students to participate in classes on their own schedule.
2. The authorities and stakeholders of tertiary institutions should do everything possible to ensure hitch-free use of computer and internet for virtual teaching-learning to take place so that it can bring its benefits to the students by

increasing students' motivation, creativity, knowledge, tolerance and responsibility in learning as well as stimulates students' critical thinking for improved academic performance.

3. Socioeconomic policies of the government at any level or arm should be formulated to enable children from low economic status to have equal opportunity as children from high economic parents to maintain the harmony among them and facilitating the ease of footing academic bills in the process of teaching and learning for [positive behavioural changes..

4. Scholarships and study support via bursaries, grants or study loans should be provided by the government and well-meaning individuals or organizations for students in tertiary institutions to ease their affordability and footing of academic bills.

5. Blended learning should be encouraged in the tertiary institutions among students as it would help in providing a rigorous and enabling learning environment for all learners concerned.

6. Teachers (lecturers) and students should be encouraged to improve their abilities to integrate a new technology into their teaching and learning process respectively which becomes an ever-larger determinant of success as well as develop positive attitude towards virtual learning.

7. Priority should be given to the provision of infrastructural facilities, modern teaching-learning equipment (both physical and virtual), adequate library and laboratory facilities by the government and all stakeholders to aid teaching and learning in tertiary institutions.

References:

Abduh, M., Purwanta, E., and Hermanto, H. (2023) In what Ways Students' Socio-Economic Status affecting Academic Performance? *International Journal of Evaluation and Research in Education, Vol. 12(1), 34-43.*

Almahases, Z. Mohsen, K. and Amin, M.O. (2021) Faculty's and Students' Perceptions of Online Learning during COVID-19. *Frontiers in Education. 6(638470), 1-10.*

Anghelache, V. (2013) Determinant Factors of Students' Attitudes toward Learning. Elsevier, *Procedia Social and Behavioral Sciences, 93(2013), 478 – 482.*

Amimi, C.M. and Oluyide, O.P. (2020) Analysis of ICT Competencies among Distance Learning Students in selected Study Centres of the National Open University of Nigeria. *Journal of Learning for Development,* 7(1), *78-89.*

Bakanauskas, A. P., Kondrotienė, E. And Puksas, A. (2020) The Theoretical Aspects of Attitude Formation Factors and Their Impact on Health Behaviour. *Management of Organizations: Systematic Research, 83(1), 15-36.*

Boca, G. D. (2021) Factors Influencing Students' Behavior and Attitude towards Online Education during

COVID-19. *Sustainability, 13(74690), 1-21.*

Caprara, L. and Caprara, C. (2021) Effects of Virtual Learning Environments: A Scoping Review of Literature. *Education and Information Technologies, 27, 3688-3722.*

Chata, C., Kangumu, B. and Abah, J. (2019) The Attitude of Grade 12 Learners towards Schoolwork in the Zambezi Region, Namibia. *Creative Education, 10(3), 570-582.*

Eze, S. C., Chinedu-Eze, V. C .A., Okike, C. K. and Bello, A. O. 2020. Factors influencing the use of E-learning Facilities by Students in a Private Higher Education Institution, HEI in a Developing Economy. *Humanities and Social Sciences Communications, 7(1), 1-15.*

Falode, O. C., Usman, H., Chukwuemeka, E. J., and Mohammed, A. H. (2020) Improving Secondary School Students' Attitude towards Geography through Physical and Virtual Laboratories in North Central Nigeria. *Pedagogical Research, 5(4), 1-9.*

Finau, J. (2021) *How Socioeconomic Status Affects Students.* Liberal Studies Program, California State University, Chico. https://scholarworks.calstate.edu/downloads/qv33s2864

Geladze, D. (2015) Using the Internet and Computer Technologies in Learning/Teaching Process. *Journal of Education and Practice, 6(2), 67-69.*

Haleem, A. Jahvid, M., Quadri, M. A., and Suman, R. (2022) .Understanding the Role of Digital Technologies in Education: A Review. *Science Direct, 3, 275-285.*

Ibode, F .O. (2017) Attitude of Students towards the Use of Computer in Education. *Nigeria Journal of Computer Literacy, 12(1), 19-27.*

Karunarathna, K. A. N. K. (2021) Effects of Course Related Factors on Academic Performances of Undergraduates-A Study with Science Courses. *Asian Journal of Education and Social Studies, 21(3), 1-12.*

Li, L. and Lee, L. (2016) Computer Literacy and Online Learning Attitude toward GSOE Students in Distance Education Programs. *Higher Education Studies, 6(3), 147-156.*

Meral, S.A. (2019) Students' Attitudes towards Learning: A Study on Their Academic Achievement and Internet Addiction. *World Journal of Education, 9(4), 104-122.*

Meyer, D. (2020) *Virtual Learning is the Way Forward for Educators.* Elmhurst University. Retrieved from https://www.elmhurst.edu/blog/virtual-learning/

Milliou, O. and Angeli, C. (2022) Design Principles for Internet Skills Education: Results from a Design-Based Research Study in Higher Education. *Springer Nature Social Sciences, 2(169), 1-26.*

Musengimana, J., Kampire, E. and Ntawiha, P. (2021) Factors Affecting Secondary Schools Students' Attitudes toward Learning

Chemistry: A Review of Literature. *EURASIA Journal of Mathematics, Science and Technology Education, 17(1),1-12.*

Orunaboka, T. T. (2011) Attitude of Nigeria Secondary School Students towards Physical Education as a Predictor of Achievement in the Subject. *Journal of Education and Practice, 2(6), 71-77.*

Pilli, A. O., Fanaeian, A. Y., and Al-Momani, M. M. (2014) Investigating the Students' Attitude towards the use of E-Learning in Girne American University. *International Journal of Business and Social Science, 5 (5)169-175.*

Pokhrel, S. and Chhetri, R. (2021) A Literature Review on Impact of COVID-19 Pandemic on Teaching and Learning. *Higher Education for the Future, 8(1), 131-141.*

Racheva, V. (2017) *What is Virtual Learning?* Vedamo Virtual Classroom and Learning Management System. https://www.vedamo.com/knowledge/what-is-virtual-learning/

Rhema, A., and Miliszewska, I. (2014) Analysis of student attitudes towards e-learning: The case of engineering students in Libya. *Issues in Informing Science and Information Technology, 11, 169-190.*

Sarkar, S. (2020) *A Brief History of Online Education*. Kolkata, India: Adamas University. https://adamasuniversity.ac.in/a-brief-history-of-online-education/

Uden, L., Sulaiman, F., Lamun, R.F. (2022) Factors Influencing Students' Attitudes and Readiness towards Active Online Learning in Physics. *Education. Sciences. 12(11), 1-22.* https://doi.org/10.3390/educsci12110746

Usha, T. S. M and Dhanalakshmi, K. (2022) Computer Skills: A Critical Literature Review and its Implications. *EPRA International Journal of Multidisciplinary Research, IJMR, 8(8), 268-271.*

Van-Wyk, M. M. (2012) Measuring Students' Attitude to Economics Education: A Factorial Analysis Approach. *Journal of Social sciences, 31(1), 27-42.*