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FALADE, AYOTUNDE ATANDA
Department, of Educational Technology
University of Ilorin, Ilorin, Nigeria
falade.aa@unilorin.edu.ng

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FALADE, AYOTUNDE ATANDA

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Abstract

Innovative and educational tools known as "emerging technological tools" are added to conventional teaching and learning methods to improve students' academic achievement. They have not been completely employed for learning among Nigerian students, despite their instructional advantages. Therefore, the research looked at how undergraduates in South-West Nigeria regarded the utility, ease of use, attitude, and intention to utilize emerging technologies. The study used a survey-style quantitative research approach. The sample of 1,412 undergraduate students from 12 Federal and State institutions in South-West, Nigeria was purposefully selected from the population of all students in the region. A validated questionnaire created by the researcher was used to gather data. While the independent t-test and Analysis of variance (ANCOVA) were used to evaluate the hypotheses at the 0.05 level of significance, percentages and mean scores were employed to address the research questions. According to the results, there was no discernible correlation between students' attitudes, intentions, perceived utility, and ease of use of emerging technologies in southwest Nigeria. The research found that, when properly incorporated into teaching and learning, emerging technological tools are superior learning methodologies for all undergraduate students and may enhance their academic performance. The research suggested, among other things, that students should get the assistance they need to properly use the newly developing technologies for learning, including all essential facilities.

Introduction

The COVID-19 epidemic has changed almost everything across the globe, including teaching and learning, and business education programs are no exception. The COVID-19 pandemic in 2020 posed significant challenges for the world economy, including school lockdowns and the shift from in-person education to online resources. To inform instructional design, assessment, evaluation, and educational policies on developing technologies in higher education institutions' instruction and learning, this led to a great deal of action research on new information conducted by many stakeholders and educational professionals.

Emerging technologies are essential to the new normal in education brought about by the COVID-19 plague. In fact, most nations view education in general and educational technology programs in particular as a way to prepare students for careers in a variety of social and economic sectors by giving them the information, attitudes, and practical skills necessary for such careers. The World Bank Group, UNESCO, and ILO (2020) stated that the focus is currently on future skills and deskilling, especially learning-to-learn skills. This would make educational systems more receptive to new trends and enable learners to adjust to changes in the employment market in the future through lifelong learning. Institutions of higher learning must work closely with research, education, and industry to enable the provision of skills training in growing fields. In addition, a significant focus on technology in education is necessary to help students adjust to a world where digital duties are replacing manual labour in the job.

Using new technologies in teaching and learning is necessary to ensure that students are prepared for the workforce of the twenty-first century and beyond. This paper focuses on emerging technologies: Ubiquitous Computing (UC), which makes computing power available anywhere, anytime; Collaboration Technologies (CT), which makes it easier to work together in real time with anyone; Extended Reality (ER), which propels the integration of digital and physical worlds into teaching and learning; Artificial Intelligence (AI), which makes it possible to enable robots to interact with humans in learning settings and acquire knowledge on their own; and Block Chain (BC), which uses computers with privacy and security guarantees. According to Grech and Camilleri (2017), with the advent of the "new normal," technology is being used more and more in all facets of society, including education. There are a lot of obstacles and worries in educational settings about the perceived simplicity of usage and desire to use emerging technology in

education. Although these technologies bring several challenges that must be overcome in order to effectively integrate them, they also present intriguing prospects to improve the learning experience. Thus, this study examined the relationships between undergraduates in South-west Nigeria's perceived utility, usability, disposition, and plan to use new technology.

Purpose of the Study

This study's primary goal is to ascertain the relationships between undergraduates in South-west Nigeria's perceived utility, usability, disposition, and plan to use new technology. This study established the correlation between undergraduates' attitude, intention, perceived utility, and how simple it is to employ new technology for education.

Literature Review

Students' Perceived Usefulness, Ease of Use, and Intention to Use Emerging Technologies for Learning

There has been a discernible rise in the usage of new technologies in education during the past couple of years. Higher education institutions use a range of Emerging Technologies in different ways to support teaching and learning. Emerging technologies and tools are clearly becoming more and more common in education, particularly in higher education (Can et al., 2019). For example, the technologies that teachers and students use most for learning include social networking sites and emerging technologies (Shodiyev, 2022). Faculty members and students utilise various technologies and services, including social networking sites (SNSs), media sharing platforms, Moodle, Waggle, Microsoft Team, and other Emerging Technologies software, to either directly or indirectly support learning (Trivedi et al., 2023).

Actually, the usage of resources like Research Gate, Academia, and LinkedIn in the workplace and classroom is improving learning outcomes. Regardless of location, a broad range of educational Emerging Technologies tools, services, and apps are accessible for use in the area of education to improve learning experiences (Can et al., 2019). The question that still has to be answered is how beneficial and simple teaching staff and students think these are to utilise. Perceived usefulness, according to Usoro et al. (2014), is a person's conviction that a technology would improve their quality of work. However, according to Lwoga (2014), perceived usefulness refers to how much students think adopting technology would help them study more effectively. According to several research (Masele, 2014; Mollel, 2013; Kacimi et al., 2012), the adoption,

integration, and continuous using technology in the classroom activities are all influenced by the perceived utility of such technologies. In essence, web-based technologies for education give teachers and students the chance to work together to create and share information.

Accordingly, the acceptance and incorporating web-based technology into instruction depend heavily on components of cooperation, communication, and involvement in the development of new information as well as the evaluation of ideas offered by others (Kazoka & Mwantimwa, 2019; Tatli, et al., 2019). These demonstrate how tools and technology offer an environment for learning where students may design their own learning experiences and work together to produce ideas (Alsadoon, 2018). Web apps, for instance, allow for direct connection between teachers and students (Trilles, 2022). Many constructivist theorists agree that using technology improves communication and information exchange between people in these ways (Deepa, 2022). Additionally, proponents of collaborative learning think that working in groups improves students' retention of knowledge compared to working alone (Hernández et al., 2019).

This is explained by the fact that when Emerging Technologies are employed, teachers and students collaborate to create concepts and materials (Gadanidis, Hoogland & Hughes, 2008). It is clear that adopting Emerging Technologies tools can improve the efficient transfer of knowledge and concepts learnt in one environment to problem-solving processes in other settings and aid learners in understanding difficult materials (Gadanidis et al., 2008). It is also common knowledge that users are better able to apply and retain knowledge when they actively engage in their learning (Ju, et al., 2009). Similarly, research (Jimoyiannis et al., 2013) demonstrates that the use of technology is essential to the meaningful, relevant, and intellectually challenging coursework that today's digital students complete. Apart from that, it's important to remember that web tools improve blended learning and foster a supportive learning environment for instructors and students (Tatli, Akbulut & Altinisik, 2019; Majid, 2014). They also give students the chance to create and modify the content they access (Grosseck, 2009).

Along these lines, using online tools helps teachers build critical thinking abilities and raises learners' self-confidence levels (Tatli et al., 2016). Akdemir et al., (2015); Yuen et al. (2011) investigated attitudes, interests, and applications of emerging technologies in education and discovered that participating educators had favourable opinions about the pedagogical advantages and significance of these tools for instruction and learning. The results also imply that teaching

staff members indicated a desire to learn new skills and become more knowledgeable about technology in order to incorporate them into lessons more skillfully and smoothly. According to the research, having access to emerging technologies improves relevant teaching and learning and builds classroom preparation for their incorporation and use. According to Hortshore and Ajjan's (2009) analysis of students' decisions to use emerging technologies, a large number of students believe that certain applications of these technologies can boost their course satisfaction, enhance their writing and learning skills, and foster stronger relationships between students and faculty. Remarkably, the report also reveals that a small percentage of pupils opted to utilise them in classroom settings.

According to Alsadoon (2018), faculty members' intentions to employ emerging technologies in the classroom are significantly predicted by how valuable they believe these technologies to be. Additionally, online technologies give instructors and students a way to submit their work. According to Ajjan and Hartshorne (2008), the technologies are beneficial when they improve the subjects being taught, students' happiness with their classes, their grades, and their appraisal and availability of learning resources. The impression of emerging technologies is improved by their capacity to alter the exchange, access, and interaction with information (Tarik & Karim, 2011). All things considered, assessing the perceived value of emerging technologies is essential to forecasting their real application in educational endeavours. According to Alsadoon (2018), a technology's perceived utility is a better indicator of its utilisation.

The degree to which an invention (technology) is thought to be simple to comprehend and operate is known as perceived ease of use (Rogers, 2003). When users are exposed to or familiar with a technology, they might judge it to be easy to use (Kazoka, 2016). Users are more likely to begin using a technology when they believe it to be simple to use (Long, 2010). On the other hand, Robinson (2009) claims that innovations and new concepts that are simpler to comprehend are embraced more quickly than those that has a significant learning curve in terms of abilities and comprehension.

Unquestionably, technologies that are simple to incorporate into the classroom environment encourage the use of cutting-edge technology in higher learning institutions (Konstantinids, Theodosiadou, & Pappos, 2013). In addition, the ease of use of interfaces (Adcock &Bolick, 2011), the low degree of skill complexity required for use (Grosseck, 2009), and the rapid and simple

access to a wide range of information and material (Ma et al., 2018) all anticipate the tools' utilisation. Along these lines, teacher and student use of Emerging Technologies is significantly influenced by how simple it is to prepare instructional materials and procedures (Tatli, et al., 2016). Hortshorne and Ajjan (2009) looked at how students choose to utilise emerging technologies and found that usability had a favourable impact on technology adoption.

This suggests that faculty attitudes towards adopting online apps for learning—that is, their intention and actual use—are significantly predicted by user-friendliness. As stated by Davis (1989), perceived user-friendliness refers to how effortless it is to utilise a specific technology. According to research by Dalvi-Esfahani et al. (2018), thought to be user-friendly was one element that influenced students' desire to continue utilising emerging technologies in classroom. Researchers (Ajjan & Hartshorne, 2008; Dearstyne, 2007) discovered that consumers and participants may now share material much more easily thanks to Emerging Technologies technology. The writers elaborate on how the technologies have more learning potential because of how simple it is to create, share, publish, and distribute knowledge. In actuality, the ease of use of emerging technologies—like MOOCs, LMSs, smart whiteboards, and other e-learning tools—determines how well they work for teaching and learning activities.

In this context, Anderson (2007) argues that Emerging Technologies promote widespread engagement and offer an architecture (user-friendliness, convenient tools) that reduces participation obstacles. However, there have not been much research done in underdeveloped nations to look at how simple people think it is to use emerging educational technologies. Many theories were established to forecast technological acceptance, however Usoro, Echeng, and Majewski (2014) point out that they are mostly applicable to industrialised nations and a small number of cultures.

Methodology

This study uses a cross-section survey approach to conduct descriptive research. The research is descriptive in the sense that it presents occurrences exactly as they occur, without any editing. The respondents' perceptions of undergraduates' usage of emerging technologies for learning at a few South-west Nigerian universities were gathered using a questionnaire created by the researcher. The survey approach was selected as it allowed the researcher to compile a lot of data on the undergraduates' opinions of cooperative technology education.

Population, Sample and Sampling Techniques

All undergraduate university students in the southwest states of Nigeria make up the study's population. All undergraduate students in the faculties of science and education at all federal and state institutions in southwest Nigeria were the study's target group. More specifically, the two faculties of the chosen universities were the source of the purposively selected sample. Only federal and state institutions in southwest Nigeria were eligible to participate in the survey. Private university undergraduate students were not approached because they could be reluctant to provide important information about their school. As a result, when the researcher did get in touch with respondents at these institutions, she might not have gotten enough information. The total number of undergraduate students in south-western Nigeria as of the 2016 academic year was used to calculate the general sample size.

To get unambiguous data for the gender variables utilised in the research, undergraduates from the federal and state universities' faculties of science and education were chosen based on their gender using a stratified random selection approach. This was carried out across departments in each of the institutions' chosen faculties. Based on the population of each university in the Zone and Research Advisors' (2006) model, proportionate sampling was utilised to calculate the right sample size for the study; the total population was 1,534. A questionnaire that was modified from earlier research by Lund (2001), Olasedidun (2014), Moon, Ji-won, and Kim (2001), was used as the study's instrument. The survey entitled "Undergraduate Perception of Emerging Technologies' Usage for Learning" The selection of items was focused on their applicability to attitudes towards usage, perceived usefulness and simplicity of usage, and desire to employ emerging technologies for education.

Validation of the Research Instrument

Four professors from the University of Ilorin's Department of Educational Technology validated the study's instrument to assess its appropriateness and relevance, taking into account the respondents' ability to understand the language, the adequacy of the content coverage, and the relevance of the findings to the stated goals. The device was modified using the suggestions made. Fifty undergraduates from the LAUTECH, Ogbomoso partook in the instrument's pilot test. The trial testing institution was not located in the study's targeted sample area. A total number of 47 of the 50 copies of the trial testing questionnaire that were returned as correctly completed were used

for the reliability analysis. The statistical tool Crombach Alpha was utilised to determine the instrument's section-by-section reliability coefficient. The availability of emerging technologies for learning, undergraduates' perceptions of its usefulness for learning, their perceptions of its ease of use for online collaborative learning, their attitudes towards using it for learning, and their intention to use it for learning were all scored 0.864, 0.56, 0.98, and 0.88, respectively. High internal consistency of the items in the study instruments was demonstrated by all of the outcomes.

Data Collection Procedure

To assist with the dissemination of the surveys, one research assistant was hired from each institution. Undergraduate students from those schools completed copies of the questionnaire. Prior to giving them the instrument, ethical considerations were taken into account throughout its administration. The respondents were informed of the study's purpose, and they were free to complete the questionnaire whenever it was convenient for them. As a result, the data that the respondents supplied was kept completely secret and utilised just for research purposes.

Data Analysis Techniques

Inferential and descriptive statistics were used in the data analysis process for the information acquired from the questionnaire. To respond to the study questions, the frequencies were transformed to means. Multiple regression analysis was used to evaluate the hypothesis. This is because it determined if several characteristics, including perceived utility, thought to be user-friendly, attitude, and intention, had significant correlations with one another. With the use of SPSS version 23.0, the statistical software for social science, hypotheses were evaluated at the significance threshold of 0.05.

Results

Hypotheses Testing

H_01: There is no significant relationship among undergraduates' perceived usefulness, ease of use, attitude, and intention to use Emerging Technologies for learning in South-west Nigeria.

The entry technique was used to conduct a multiple correlation analysis in order to examine the link between ease of use, attitude, and intention on the criteria variables usefulness. Tables 2 present the findings from the analysis.

TABLE 1: MODEL SUMMARY ON PERCEIVED USEFULNESS

R	R^2	Adj.R^2	Std. Err. of Estimate	Change Statistics				
				R^2 Change	F Change	df_1	df_2	Sig. F Change
.497[a]	.247	.245	.39762	.247	153.627	3	1408	.000

a. Predictors: (Constant), Intention to use Emerging Technologies for learning, Perceived ease of use of online collaborative for learning, Attitudes towards the use of Emerging Technologies for learning.

Based on Table 1's outcome, the Adjusted R Square (.25) exhibits a poor match. This showed that the dependent variable (useful) had a variation of.25%, which can be explained by the multiple regression models that was built using the independent variables (perceived ease of use, attitude, and intention to use). Table 3 displays the findings from the model's analysis of variance (ANOVA).

TABLE 2: ANOVA FOR USEFULNESS

	Sum of Sq.	df	Mean Sq.	F	Sig.
Regression	72.865	3	24.288	153.627	.000[b]
Residual	222.605	1408	.158		
Total	295.471	1411			

a. Dependent Variable: Perceived usefulness of Emerging Technologies for learning
b. Predictors: (Constant), Intention to use Emerging Technologies for learning, Perceived ease of use of online collaborative for learning, Attitudes towards the use of Emerging Technologies for learning.

Table 2 displays the findings of the analysis of variance (ANOVA) conducted on the usefulness independent variable. According to the findings, F (3, 1408) = 153.63, p = 0.00. Because the p-value is less than 0.05, this suggests that the association is statistically significant. The outcomes are displayed in Table 2.

TABLE 3: COEFFICIENT OF PERCEIVED USEFULNESS

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	1.326	.093		14.213	.000
Perceived ease of use of online collaborative for learning	.488	.024	.482	20.618	.000
Attitudes towards the use of Emerging Technologies for learning	.038	.034	.039	1.125	.261
Intention to use Emerging Technologies for learning	.082	.029	.098	2.868	.004

a. Dependent Variable: Perceived usefulness of Emerging Technologies for learning

(a) Because the value of perceived ease of use (β =.48,.00) is smaller than the 0.05 alpha value, the independent variable has the biggest positive impact on the usefulness of emerging technologies. This association is statistically significant.

(b) Because the value of the independent variable, intention to use, was smaller than the 0.05 alpha value, the beta (β =.10,.00) indicates a statistically significant association between the two variables and the usefulness of emerging technologies for learning.

(c) Nevertheless, while the value of the independent variable, attitude to use, was more than the 0.05 alpha value, the beta coefficient (β =.04,.26) did not reveal a statistically significant association between it and the intention to use emerging technologies for learning.

Discussion of Findings

Research Question 2 and Hypothesis 1 were used to investigate the link between Undergraduates' perceived utility, usability, disposition, and goal to employ Emerging Technologies in instruction. Regression research revealed a substantial correlation between their reported usability, disposition, and goal (independent factors) and perceived usefulness (dependent variable). Additionally, the research showed a substantial correlation between their perceived usefulness, attitude, and intention (independent factors) and perceived ease of use (dependent variable). Furthermore, it was shown that the respondents' attitude (a dependent variable) and their perceptions of the utility, simplicity of use, and intention to employ emerging technologies in teaching (independent factors) were significantly correlated. Moreover, there was a noteworthy correlation seen between their intention (a dependent variable) and their attitude (an independent variable) towards the employment of Emerging Technologies in education, as well as their perceived utility and simplicity of use.

These results concurred with those of several academics. According to Yaghoubi and Bahmani (2010), there are substantial correlations between attitude and perceived ease of use, attitude and perceived usefulness, intention and perceived usefulness, and perceived usefulness and attitude with intention and perceived usefulness. The results of Taylor and Todd (1995), Davis (1989), and Cheng, Lam, and Yeung (2006) were likewise in agreement with these. Additionally, Bertrand and Bouchard (2008) discovered a strong correlation between attitude, perceived utility, perceived ease of use, and intention to use. The results, however, were at odds with those of Ifinedo (2006), who discovered that, in the context of web-based learning tools, perceived utility and utilisation has an impact on the desire to continue, but perceived simplicity of use did not. Therefore, it was possible to deduce from the results that the variables of attitude, perceived utility, perceived ease of use, and intention to adopt emerging technologies in teaching were significantly correlated. These all make way for practical use. Undergraduates were thought to have an easy time integrating Emerging Technologies into their teaching as they were already discovered to be in existence.

Conclusion

According to the study, developing technology tools are better learning techniques that can improve academic achievement for all undergraduate students when appropriately integrated into teaching and learning.

Recommendation

The study recommended that undergraduates be given the necessary supports on the provision of all needed facilities for proper use of emerging technology for learning, as there were significant relationships between the variables of perceived usefulness, perceived ease of use, attitude, and the intention to use emerging technologies in teaching.

References

Brown, M; McCormck, M; Reeves, J., Brooks, C., & Grajek, S. (2020). EDUCAUSE Horizon Report. *Teaching and Learning Edition, Louisville, CO: EDUCAUSE*

Chaudhary, S (2017). Artificial Intelligence in Education. *International Journal of Social Science & Interdisciplinary Research, 6*(4), APRIL (2017), 16-28

Chiou, C. K., Tseng Judy, C. R., Hwang, G. J., & Heller, S. (2010). An adaptive navigation support system for conducting context-aware ubiquitous learning in museums *Computers & Education, 55*(2), 834–845

Corinne, M.(2018).E merging Technologies in Higher Education and the Workplace: An Assessment. Published by International Federation of Catholic Universities Higher Education Foresight Unit. Retrieved from Online via www.nap.edu

Enang C. E. & Okute, A. L. (2019). Leveraging on new technologies for skills acquisition of business educators in tertiary institutions in Nigeria for the e-world. Nigerian Journal of Business Education, 6 (1), 331-330, Retrieved from www.nigjbed.com.ng

Federal Republic of Nigeria (2013) National Policy on Education 6th Edition, Lagos, NERDC Press

Fryer,L. K; Nakao,K& Thompson A. (2019).Chatbot learning partners: connecting learning experiences, interests and competence. *Computers in human behaviors,* (93), 279- 289

Grech, A. and Camilleri, A. F. (2017). *Blockchain in Education.* https://ec.europa.eu/jrc/en/publication/eurscientific-and-technical-research-reports/blockchain- education

Hsieh, S.-W., Jang, Y.-R., Hwang, G.-J., & Chen, N.-S. (2011). Effects of teaching and learning styles on students' reflection levels for ubiquitous learning. *Computers & Education*, *57*(1), 1194- 1201

Huang, R. H., Liu, D. J., Tlili, A., Yang, J. F., & Wang, H. H. (2020). Handbook on facilitating flexible learning during educational disruption: The Chinese experience in maintaining undisrupted learning in COVID-19 Outbreak. Smart Learning Institute of Beijing Normal University UNESCO, 1–54. Retrieved from: https://iite.unesco.org/news/handbook-on-facilitating-flexible-learningduring-educational-disruption/

Hwang, G. J., Shi, Y. R., & Chu, H. C. (2010). A concept map approach to developing collaborative mindtools for context-aware ubiquitous learning. *British Journal of Educational Technology* 42 (5), 778–789

ILO (2020). TheDigitizationofTVETandSkillsSystems.Geneva:ILO.

ILO, UNESCO and the World Bank Group (2020). Joint Survey on Technical and Vocational Education and Training (TVET) and Skills Development during the time of COVID-19. https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/documents/genericdocument/wcms_742817.pdf.

Khare, K., Stewart, B. &Khare, A. (2018). *Artificial intelligence and the student experience: An institutional perspective*. The International Academic Forum (IAFOR).

Liu,T.,Y.,Tan,T.,H. & Chu, Y.,L. (2009).Outdoor Natural Science Learning with Supported Immersive Ubiquitous Learning Environment. *Educational Technology &Society,* 12 *(4),* 161– 175

Ma, Yizhi&Siau, Keng L. (2018). *Artificial Intelligence Impacts on Higher Education. MWAIS 2018 Proceedings. 42.* Proceedings of the Thirteenth Midwest Association for Information Systems Conference, Saint Louis, Missouri May 17-18

Oliveira, A; Behnagh, R. F; Ni, L; Mohsinah, A. A; Burgess, K.J; and Guo, L. (2019). Emerging technologies as pedagogical tools for teaching and learning science: A literature review. Human Behaviour& Emerging Technology, (1) 149–160.

Paas, F.;Sweller, J. (2012). An evolutionary upgrade of cognitiveload theory: Using the humanmotor system and collaboration to support the learning of complex cognitive tasks. *Educ. Psychol. Rev (*24*)*, 27–45.

Pomerantz, J. (2019). Teaching and Learning with Extended Reality Technology. *Information and technology transforming lives: connection, interaction, innovation*.

Spector, J. M. (2013). Emerging Educational Technologies and Research Directions. Educational Technology & Society, 16 (2) 21–30.
Teachthought (2016). Specific examples of emerging Educational technologies. Retrieved from Online via www.teachthought.com.
Tuomi, I. (2018). T*he impact of artificial intelligence on learning, teaching, and education. Policies for the future. Retrieved from: http://publications.jrc. ec.europa*eu/repository/bitstream/JRC113226/jrc113226_jrcb4_the_impact_of_artificial_i ntelligen ce_on_learning_final_2.pdf.
UNESCO (2021). Education 2030. Retrieved from: (http://www.unesco.org/open-access/terms-use-ccbysa-en).