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Reframing barriers to e-learning adoption: An entrepreneurial and strategy perspective

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The changing landscape of higher education orchestrated by the growing use of e-learning presents significant opportunities and threats to higher education institutions in developing countries like Nigeria. However, e-learning is not widely adopted by Nigerian institutions due to contextual and individual barriers. This study aims to advance our understanding of the determinants of e-learning adoption by reconceptualising e-learning adoption barriers from an entrepreneurial and strategic perspective. Using Partial Least Square approach to Structural Equation Modelling (PLS-SEM) to analyse data collected from 305 respondents, the findings of the study demonstrate that entrepreneurial orientation and strategic planning significantly influence e-learning adoption. The findings of the study advance our understanding of e-learning adoption barriers and also provide new insights to managers of higher education institutions with regards to e-learning adoption.

Key words: E-learning, e-learning adoption, entrepreneurial orientation, strategic planning, higher education institutions.

INTRODUCTION

The changing environment of higher education

The environmental landscape of higher education has been undergoing significant changes in the last two decades due to the dramatic growth of the internet and web-based technologies. These changes are especially visible in higher education as the use of e-learning gains prominent role in delivering education to geographically dispersed learners (Keats and Schmidt, 2007; Williams and Goldberg, 2005; Sekulovska–Jovkowska and Tosheva, 2021). E-learning, aided by rich multimedia resources, enables teaching and learning to take place over the internet. The use of e-learning has attracted more students to enrol in higher education institutions and it has also increased the social and demographic

diversity of the student population (Cox, 2021). Rather than the traditional age cohort of 18-24 years old, the profile of students in higher education institutions has changed to include a large and growing number of part-time students that require flexible delivery of education (Williams and Goldberg, 2005), especially to meet the demands of lifelong learning (Eynon and Malmberg, 2021; Lock et al., 2021) The use of e-learning has resulted in the need for educational programmes to be demand driven, student-centred, customizable and highly scalable in an evolving technological environment (MacDonald et al., 2001; de Souza Rodrigues et al., 2021). It is therefore necessary for course contents, learning programmes and pedagogy offered by higher education institutions to suit the needs of students.

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The changing environment of higher education orchestrated by e-learning presents significant opportunities as well as threat to higher education institutions in developing countries such as Nigeria. E-learning has the potential to address educational inequalities by increasing access to cost effective and flexible education (Maphalala and Adigun, 2021). This is especially important for Nigerian institutions to resolve the issues of access, quality and cost of higher education (Bamiro, 2012). In other words, e-learning can be used to increase access to higher education without significant increase in cost or effect on quality. Moreover, the availability and affordability of the internet across Nigeria makes e-learning adoption feasible and viable for Nigerian institutions. On the other hand, e-learning presents a threat to Nigerian institutions as new global private higher education providers (Keats and Schmidt, 2007) and the globalization of established higher education institutions (Bound et al., 2021) emerges to compete in the Nigerian higher education space. Hence, without innovation and adaptation to the evolving e-learning environment, Williams and Goldberg (2005) predict that only institutions with strong brand equity may survive the changes taking place in the higher education sector.

Considering the opportunities and threats presented by the evolving e-learning environment in higher education, developing countries cannot afford to act passively if they are to compete in the global economy (Sekulovska–Jovkowska and Tosheva, 2021). Thus, it is expected that higher education institutions in Nigeria will make the cultural shift (Keats and Schmidt, 2007) of integrating e-learning with their existing systems and that e-learning will be widely adopted. Contrary to this expectation, many higher education institutions in Nigeria are yet to adopt e-learning (Kuliya and Usman, 2021).

Several studies have investigated the barriers to e-learning adoption in higher education institutions (Al-Azawei, Parslow, Lundqvist, 2016; Ali et al., 2017; 2008; Ansong, Lovia Boateng, Boateng, 2017; Folorunso et al., 2006; Jimoh-Kadiri and Bupo, 2011; Jones, 2004; Kanwal and Rehman, 2017; Kisanga and Ireson, 2015; Mtebe and Raisamo, 2014; Nwabufo et al., 2013; Ololube et al., 2007; Oluyinka and Endozo, 2019; Rakhyoot, 2017; Regmi and Jones, 2020; Sife et al., 2007; Tagoe, 2012; Unwin et al., 2010). From these studies, barriers to e-learning adoption in higher education institutions can be summarized into contextual and individual factors. Contextual factors are issues relating to the availability of adequate e-learning infrastructure and poor institutional support for e-learning adoption (Kisanga and Ireson, 2015; Mtebe and Raisamo, 2014; Sanga et al., 2013; Sife et al., 2007; Turnbull et al., 2021; Unwin et al., 2010). While individual factors relate to knowledge gap such as technical know-how necessary for designing, implementing and supporting e-learning programmes and behavioural barriers such as academic staff's attitude

towards e-learning and resistance to change (Folorunso et al., 2006; King and Boyatt, 2015; Maphalala and Adigun, 2021; Regmi and Jones, 2020; Renda dos Santos and Okazaki, 2016; Chu and Chen, 2016).

Conceptualizing e-learning adoption barriers by modelling only these two factors (contextual and individual factors) present a narrow perspective and inadequate explanation why e-learning is not widely adopted by many higher education institutions in Nigeria. Thus, there is the need to conceptualize e-learning adoption barriers from a broader perspective. In trying to fill this gap, we conducted extensive review of the extant literature to identify other factors that may provide more insight on e-learning adoption barriers. Based on the literature reviewed so far, there seems to be no study that conceptualized e-learning adoption barriers from an entrepreneurial and strategy perspective. An entrepreneurial and strategy perspective enables organizations to take proactive measures to identify, evaluate and commit resources to adapt to changes in their environment. Hence, this study seeks answers to the question, what are the impacts of entrepreneurial orientation and strategic planning on e-learning adoption in higher education institutions in Nigeria?

This study aims to fill this gap and advances our understanding of e-learning adoption barriers by making three important contributions. First, we demonstrate that entrepreneurial orientation and strategic planning play significant roles in determining the adoption of e-learning in higher education institutions. We re-conceptualized the determinants of e-learning adoption from an entrepreneurial and strategic planning perspective thereby broadening the determinants of e-learning adoption. Barriers to e-learning adoption in higher education institutions are therefore reframed as an entrepreneurial and strategic planning problem. Viewing e-learning adoption barriers from these perspectives provide a broader approach to theoretically and practically investigate the determinants of e-learning adoption. We theorize that entrepreneurial orientation and strategic planning will better explain barriers to e-learning adoption for two reasons. First, entrepreneurial orientation explains the willingness of institutions to engage with new technology and extend their activities to accommodate innovations such as e-learning. Without entrepreneurial behaviour, institutions are likely to maintain status quo and not respond to changes in their environment. Second, strategic planning demonstrates an institution's commitment towards the adoption of e-learning. Without strategic plans, institutions are likely not to understand the contextual (Kisanga and Ireson, 2015) and individual (King and Boyatt, 2015) factors required to inculcate e-learning into their existing systems.

Second, the study examines the role of strategic planning as an important factor that mediates the relationship between entrepreneurial orientation and e-learning adoption. This is important for two reasons.

First, strategic planning induces strategic thinking (Alatailat et al., 2019) that enables institutions to adequately diagnose their e-learning adoption requirements as well as potential e-learning adoption barriers. Understanding these two factors (e-learning adoption requirements and potential e-learning adoption barriers) creates opportunities for institutions to attempt to mitigate their impact on their e-learning adoption efforts. Second, we integrate strategic planning into our conceptual model in support of research that advocates that the configuration of entrepreneurial orientation and strategic planning lead to high performance (Rigtering et al., 2017). Thus, in this study we examined the impact of entrepreneurial orientation and strategic planning on e-learning adoption.

Third, we conducted an empirical study to test our hypotheses and to measure the impact of entrepreneurial orientation and strategic planning on e-learning adoption. The study also contributes to practice by drawing the attention of managers of higher education institutions to the value of entrepreneurial behaviour and strategic planning in aiding e-learning adoption.

Access to higher education in Nigeria and the need for e-learning adoption

There is a growing trend in the worldwide demand for higher education. This growing demand for higher education has led to a significant increase in the higher education participation rate across the world. Agboola and Ofoegbu (2010) described the higher education participation rate as the percentage of 18-35 years enrolled in higher education institutions. According to Marginson (2016), the worldwide higher education participation rate grew from 9.9% in 1971 to 32.9% in 2013; while the estimated higher education participation rate in Nigeria was 8.1% in 2010 (Agboola and Ofoegbu, 2010; Okebukola, 2008).

Like many developing countries, Nigeria is faced with inadequate resources to accommodate all candidates seeking admission to higher education institutions. The collective carrying capacity of all higher education institutions in Nigeria is significantly lower than the number of applications received from qualified candidates (Akinyemi and Basse, 2012; Aluede et al., 2012; Odia and Odia, 2020; Okeke, 2009). Between 2013 and 2017, about six million candidates were denied admission into universities due to the inadequate carrying capacity of the institutions (Daily Trust, 2018). Similarly, in 2017 the National Universities Commission (NUC) reported that only 30% of the 1.7 million of the candidates who applied to universities were accommodated by the Nigerian university system (Punch Newspaper, 2017). According to Aluede et al. (2012), only about 5.2 to 15.3% of candidates applying for admission to higher education institutions in Nigeria get admitted every year. Thus, there is a significant demand-supply gap in the higher

education system in Nigeria.

The government of Nigeria is trying to address this issue by building new institutions. For example, between 1999 and 2019, the National Universities Commission granted operating licences to 138 new universities. Although the establishment of these new institutions have increased the capacity of the higher education system in Nigeria, it has not been able to significantly address the demand-supply due to a fast-growing population with growing demands for higher education.

Prior studies suggest the adoption of e-learning as a viable and cost-effective alternative to rapidly expand access to higher education (Algahtani, 2011; Arkorful and Abaidoo, 2015; and ease the admission crisis (Kanyip, 2013) in Nigeria's higher education system. Moreover, the on-going digitization of all aspect of the global society, especially the discourse about the future of higher education in a digitized world (Rabin et al., 2020), necessitates the adoption of e-learning. However, many higher education institutions in Nigeria are yet to adopt e-learning (Kuliya and Usman, 2021).

THEORETICAL FRAMEWORK AND HYPOTHESES

E-learning and e-learning adoption

E-learning is a new and evolving method of delivering education driven by development in internet and web-based technologies. E-learning enables the delivery of education to geographically dispersed persons. Hence, e-learning is sometimes confused with distance education. However, as Gros and García-Peñalvo (2016) pointed out, e-learning and distance education are different concepts, even though e-learning can be described as a natural evolution of distance learning (Sangrà et al., 2012; Tokarieva et al., 2021). While distance education offers teaching materials and tutorials by correspondence, e-learning emerged with the growth of the internet (Friesen, 2009). Distance education is designed around tutorial materials delivered by correspondence. E-learning is designed around multimedia materials delivered over the internet. Therefore, e-learning is the use of the internet and web-based technologies to deliver education to geographically dispersed persons. Hence, e-learning adoption is defined as the implementation and consistent use of e-learning methods to deliver the teaching and learning of courses and programs to geographically dispersed persons.

Entrepreneurial orientation and e-learning adoption

Entrepreneurial orientation is the level of entrepreneurial behaviour in an organization that enables the organization to take actions and initiatives that transform or extend its scope of operations into new domains in response to changes in the environment (Guth and

Ginsberg, 1990; Bloodgood et al., 2015; Kuratko and Morries, 2018; Ruba et al., 2021). Entrepreneurial orientation is usually credited as the driving force behind the pursuit of new concepts, products, process and markets (Covin and Wales, 2012, 2019). The pursuit of these new activities is aimed at improving the performance of an organization (Naldi et al., 2007) as well as responding to the changes in the environment (Balasubramanian et al., 2020). Several studies found positive association between entrepreneurial orientation and performance (Abdalla and Mohamed, 2020; Basco et al., 2020; Diaz and Sensini, 2020; Soares and Perin, 2020). Entrepreneurial orientation aid performance by instigating changes in the activities of organizations such as technological changes and changes in consumers' behaviors. Hence, the changing landscape of higher education (Keats and Schmidt, 2007; Williams and Goldberg, 2005) presents opportunities for entrepreneurial institutions to expand their scope of operations to include e-learning in response to changes in students' profile (Williams and Goldberg, 2005) and aligns their pedagogy to suit students' demand (Engelbrecht, 2003).

Covin and Slevin (1998) describe entrepreneurial orientation as an entrepreneurial-conservation continuum scale where organizations that score low on the scale are termed to be conservative, while those that score higher are termed to be entrepreneurial. Entrepreneurial organizations are more likely to instigate changes, are proactive, aggressive and are continually prospecting for new ways to alter their industry to their advantage and to outperform their competitors (Miles et al., 1978; Miller and Friesen, 1982; Miller, 1983). Considering the role of entrepreneurial orientation as the driving force behind the pursuit of new concepts (Covin and Wales, 2012), entrepreneurial institutions in Nigeria are more likely to adopt e-learning irrespective of the contextual factors (Kisanga and Ireson, 2015; Sife et al., 2007; Unwin et al., 2010; Mtebe and Raisamo, 2014; Sanga et al., 2013). Thus, we theorize that entrepreneurial institutions are more likely to adopt e-learning for two reasons.

First, contextual factors such as inadequate infrastructure (Kisanga and Ireson, 2015) and financial constraints (Bischoff et al., 2020) are the norm rather than the exception in Nigeria. These factors are instinctively designed into the activities of entrepreneurial organizations operating Nigeria. In other words, entrepreneurial organizations operating in Nigeria usually take proactive measures to try to mitigate the negative impact of these environmental factors on their activities by using other creative means that compensate for some of the inadequacies in the environment. Second, the availability of free e-learning tools such as Google Classroom, Zoom Learn and Moodle negate the necessity for institutions to invest in expensive learning managements systems. Additionally, according to the Nigerian Communications Commission (2021), there

were 154 million internet users in Nigeria, representing 73% internet penetration as at December, 2020. Hence, two of the major infrastructural components required for institutions to use e-learning (learning managements systems and the internet) are available to higher education institutions in Nigeria. However, availability does not necessarily translate into use. Entrepreneurial institutions will recognize the availability of these e-learning components and take proactive measures to annex them in their e-learning adoption efforts. Considering that entrepreneurial institutions are opportunity seeking and that the perceived benefits of e-learning adoption (Algahtani, 2011; Arkorful and Abaidoo, 2015; Rakhyoot, 2017) presents an opportunity to respond to and take advantage of the changing higher education landscape, we argue that entrepreneurial institutions are more likely to adopt e-learning. Thus, the following hypothesis is proposed:

Hypothesis (H1): High levels of entrepreneurial orientation in higher education institutions will positively influence e-learning adoption in the institutions.

Strategic planning and e-learning adoption

Several authors have attempted to define the concept of strategic planning (Akinyele and Fasogbon, 2010; Alosani et al., 2019; Armstrong, 1982; Eigerman, 1988; Hopkins and Hopkins, 1997; Ketokivi and Castaner, 2004; Ocasio and Joseph, 2008). These studies typically conceptualize strategic planning as a tool that guides organizations to a desired future position. Therefore, strategic planning is seen as an approach that organizations use to set objectives, generate and evaluate strategies, monitor results and obtains commitments (Armstrong, 1982; Hopkins and Hopkins, 1997).

Some studies have identified positive association between strategic planning and organizational performance (Aboramadan and Borgonovi, 2016; Andersen, 2000; Kornelius et al., 2021; Owolabi and Makinde, 2012; Song et al., 2011; Tapinos et al., 2005; Wood and La Forge, 1979). For example, in a study conducted at Babcock University, Nigeria, Owolabi and Makinde (2012) found positive correlation between strategic planning and the performance of the institution. Other studies (Fredrickson and Mitchell, 1984; Robinson and Pearce, 1983) dispute the positive effect of strategic planning on performance. Robinson and Pearce's (1983) study of small banks in America found no significant difference in the performance of banks that instituted strategic planning and those that did not. Falshaw et al. (2006) argue that strategic planning may even inhibit performance as centralized planning may limit autonomous actions and adaptive behaviour of managers. However, Andersen (2000) states that autonomous action (and adaptive behaviour) of managers

moderates the relationship between strategic planning and performance, and directly impacts performance. Therefore, autonomous actions and adaptive behaviour especially of mid-level managers complement strategic planning and enable organizations to achieve better performance. Priem et al. (1995) argue that the relationship between strategic planning and organizational performance is moderated by the environment. Stable environments are more predictable, thus making strategic planning more feasible and impactful. However, in dynamic environments, changes occur rapidly, which makes predictability difficult; hence strategic planning may not significantly influence performance. Thus, the strategy literature is inconclusive with regards to planning-performance relationship (Andersen, 2000).

This study aligns with the position that strategic planning will positively influence the planning-performance relationship with regards to e-learning adoption in higher education institutions in Nigeria. We support this position for two reasons. First, higher education institutions in Nigeria operate in a relatively stable environment which aids strategic planning. Higher education institutions in Nigeria are highly regulated by governmental agencies. Policy changes in higher education are usually extensively debated before being adopted, thereby providing institutions ample time to prepare and adapt to policy changes. In other words, predictable policy changes create a predictable environment that enables impactful planning-performance relationship.

Second, key elements of strategic planning (such as mission statements, goal setting, strategic action plans and on-going controls) (Anderson, 2000) will aid e-learning adoption in higher education institutions. Mission statement (in this case e-learning policy statement) describes an institution's e-learning purpose and guides its e-learning activities. Ireland and Hitt (1992) argues that an effective mission statement provides motivation and direction to an organization by describing its unique purpose, scope of operations and product/service offerings. Thus, e-learning policies will guide e-learning decision-making process, thereby improving the ability of institutions to meet their e-learning goals (Patrick and Caplow, 2018). According to Beal (2017) and Robertson (2018), goal setting is the process of establishing clear and usable targets or objectives that an organization aspires to achieve. This is consistent with Locke (1968)'s goal-setting theory which suggests that people are motivated to strive towards goals (Landers et al., 2015). Thus, institutions with clear e-learning goals will be motivated towards achieving them. Considering that higher education institutions operate in a relatively stable and predictable environment and that effective deployment of key elements of strategic planning is capable of aiding e-learning adoption, we therefore propose the following hypothesis:

Hypothesis (H2): Strategic planning of the implementation and use of e-learning in higher education institutions will positively influence to e-learning adoption in the institutions.

Strategic planning, entrepreneurial orientation and e-learning adoption

As argued above, both entrepreneurial orientation and strategic planning have significant influence on e-learning adoption. We argue further that the impact of entrepreneurial orientation on e-learning adoption is enhanced when mediated by strategic planning. Strategic planning aids entrepreneurial pursuit by clarifying and organizing entrepreneurial activities into clearly defined, articulated and documented organizational objectives/goals. While institutions take entrepreneurial decisions to adopt e-learning, strategic planning provides the tools that enable the institutions to identify and allocate resources required to exploit e-learning opportunities and to monitor and evaluate the progress of their e-learning adoption efforts. Additionally, strategic planning interprets entrepreneurial decisions into a clear and common vision among employees (Guo et al., 2020). Therefore, strategic planning aligns the leadership, employees and resources of institutions to aid e-learning adoption, while reducing the probability of e-learning adoption failures (Al-araibi et al., 2019; Romiszowski, 2003). Hence, the following hypothesis is proposed:

Hypothesis (H3): The relationship between entrepreneurial orientation and e-learning adoption in higher education institutions is mediated by the institutions' strategic e-learning plans.

METHOD

Research population

The population for this study includes all higher education institutions in Nigeria. We define higher education institutions in Nigeria to include only universities, polytechnics and colleges of education. Other forms of post-secondary education institutions are excluded from the population. There were 438 higher education institutions in Nigeria at the time the study survey was conducted. According to the National University Commission (2019), there were 165 universities. While the National Board for Technical Education (2019) and the National Commission for Colleges of Education (2019.) listed 130 polytechnics and 143 colleges respectively on their website. Polytechnics are post-secondary technical institutions designed to train mid-level technical managers. While Colleges of Education are post-secondary institutions dedicated to the training of primary and secondary school teachers.

Scale development

Guided by the literature, we developed a testable conceptual model as depicted in Figure 1. The conceptual model includes patterns of interaction between entrepreneurial orientation, strategic planning

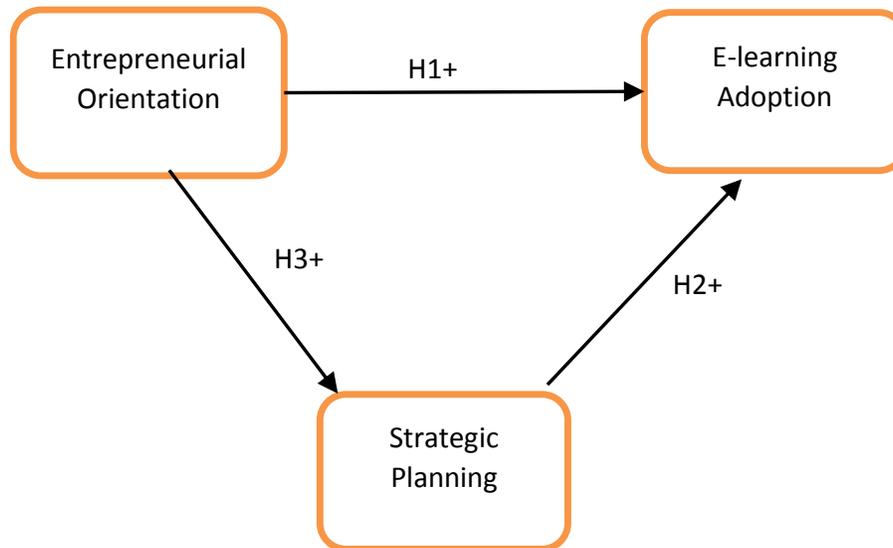


Figure 1. Conceptual framework showing strategic planning mediating the relationship between entrepreneurial orientation and e-learning.

and e-learning adoption. The study employed a self-administered questionnaire. All items in the questionnaire were drawn from previous studies and are based on a five-point Likert scales using statements anchored “Strongly disagree” (1) to “Strongly agree” (5). However, the items were adapted to the current study. Entrepreneurial orientation was measured as a unidimensional construct using seven items obtained from Hughes and Morgan (2007). Strategic planning was measured with five items from Andersen and Nielsen (2009) and Gaebel et al. (2014); while e-learning adoption was measured with three items obtained from Gaebel et al. (2014) and Chu and Chen (2016). A pilot study was conducted in four higher education institutions in Nigeria. The institutions include two universities, one polytechnic and one college of education. Feedback from the pilot study was also used to modify the questionnaire. Additionally, the reliability and validity of the scale was assessed as described in the measurement model.

Sampling and data collection

The study employed a cross-sectional survey and quantitative design to examine the impact of entrepreneurial orientation and strategic planning on e-learning adoption in higher education institutions in Nigeria. Self-administered questionnaires were used to collect data from the survey respondents. The survey for the study was administered using the online survey administration app ‘Google Forms’ and also by traditional printed paper forms in 44 higher education institutions in Nigeria. Online survey is cost effective and enables us to administer the survey in all regions of the country. To conduct the online survey, we collected details (names and emails) of potential respondents from their institution’s website. However, many institutions especially polytechnics and colleges of education either did not have a website or did not display details of potential respondents on their website. This necessitated the use of printed paper survey.

To administer the online survey, details of potential respondents were obtained from the websites of 29 purposively selected universities. The 29 universities were selected using two criteria. First, we wanted the selected universities to be spread across all six

geopolitical regions in the country to avoid obtaining data only from a section of the country. Thus, eleven institutions were selected from South-West, six from South-East, five from South-South, four from North-Central, two from North-West and one from North-East Nigeria. The number of institutions selected from each region is a rough estimation of the percentage representation of the number of institutions per region. For example, 34% of all universities are located in the south-west region, while only 9% are located in the north-east region. Second, the selected universities should have a good mix of federal, state and private institutions. Hence, the selected institutions included ten federal universities, eight state universities and eleven private universities. We sent 1,015 emails inviting potential respondents to complete the online questionnaire. However, only 609 emails were delivered (406 emails returned as failure delivery). We received 84 responses from the online survey. All responses were usable.

In addition to the online survey, we visited 15 purposively selected institutions in two geopolitical regions (south-west regions and south-south). These regions have the largest concentration of higher education institutions in the country. The institutions visited included six universities, three polytechnics and five colleges of education. The questionnaire was distributed and collected using the administered-on-site method. The administered-on-site method significantly improves the response rate of questionnaire surveys (Snow and Thomas, 1994). However, this method is limited by the availability of potential respondents on-site at the same time of the survey. We collected 253 completed questionnaires from respondents. However, only 221 were usable. In total, we received 305 usable responses from both online (84 responses) and printed paper questionnaires (221 responses). Both the online and printed questionnaires were administered to academic staff only. We focused our attention only on academic staff because they are most likely to make e-learning adoption decisions in their institutions. Following the suggestions of Hair et al. (2014), we consider that the sample size is adequate for the study. According to Hair et al. (2014), the desired sample size should be 15 to 20 observations for each independent variable. Considering that the current study consists of only two independent variables, we consider the sample size of 305 appropriate.

Table 1. Demographic information of the respondents.

Demographics	Sub-group	Frequency	Percentage
Age of Institution (years)	<10	8	0.03
	10 to 20	78	0.26
	21 to 30	13	0.04
	>30	206	0.68
Type of Institution	Universities	190	0.62
	Polytechnics	53	0.17
	Colleges of Education	62	0.20
Ownership of Institution	Federal	198	0.65
	State	82	0.27
	Private	25	0.08

Data analysis

The Partial Least Square approach to Structural Equation Modelling (PLS-SEM) on SmartPLS Version 3 (Ringle et al., 2015) was employed to analyse the data and test the hypotheses for the study. PLS-SEM was chosen because the conceptual model seeks to measure entrepreneurial orientation and strategic planning prediction of e-learning adoption. PLS SEM is very useful for examining relationships and prediction of constructs. Moreover, the non-parametric distribution of the data supports the use of PLS-SEM (Hair et al., 2019). As suggested by Sarstedt et al. (2017), a two-step approach was used in evaluating the Structural Equation Model. First, the reliability and validity of the measurement model were tested, followed by the significance of the structural path between the latent constructs in the conceptual model.

RESULTS

Demographic profile of the respondents

The demographic profile of the respondents (Table 1) indicates that 3% of the institutions are less than 10 years old. Majority of the institutions (68%) are older than 30 years. Universities make up 62%, polytechnics and colleges of education make up the remaining 38%. The Federal Government of Nigeria owns 65% of the institutions, while state governments and private organizations own 27 and 8%, respectively (Table 1).

Measurement model assessment

The measurement model was assessed using reliability, convergent validity and discriminant validity. Cronbach's alpha (α) and Composite reliability (CR) were used to test the internal consistency reliability of the model. Cronbach's alpha and Composite reliability value should be ≥ 0.70 (Henseler et al., 2016; Urbach and Ahlemann, 2010). Convergent validity was measured using the Average Variance Extracted (AVE). Hair et al. (2014), recommended that the AVE should be ≥ 0.50 for convergent validity to be assured. Discriminant validity is

measured by the loadings of each indicator (Chin, 1998; Urbach and Ahlemann, 2010), the square root of the AVE for each construct (Fornell and Larcker, 1981) and the heterotrait-monotrait ratio of correlations (HTMT) (Henseler et al., 2015).

Initially, the measurement model consisted of fifteen reflective indicators. However, three items were deleted in order to meet the recommended threshold of 0.5 for the average variance extracted (AVE), to reduce collinearity and to improve the model fit. After deleting the three items, the measurement model shows an acceptable fit ($SRMR = 0.043$, $NFI = 0.905$) (Hu and Bentler, 1998).

Convergent validity

As indicated in Table 2, standardized loading values for constructs with multiple indicators exceeded the recommended threshold of 0.5. The AVE for the constructs also exceeds 0.5, while Cronbach's alpha and composite reliability values for all constructs are compellingly higher than the 0.7 threshold.

Discriminant validity

Heterotrait-monotrait ratio of correlations (HTMT) was used to assess the discriminant validity of the model. According to Henseler et al. (2015), HTMT values should be less than 0.90. The results of the $HTMT_{0.90}$ presented in Table 3 indicate that the correlation among the constructs is less than 0.90, indicating good discriminant validity.

Common method bias

As recommended by Kock (2015), if the variance inflation factors (VIFs) in a full collinearity test are equal to or less than 3.3, then the model can be considered free of common method bias. The highest VIF is 2.99.

Table 2. Factor loadings and reliability statistics.

Factor	ADP	EO	SP	α	C.R	A.V.E.
ADP2	0.828	0.542	0.647	0.86	0.86	0.76
ADP3	0.914	0.604	0.713			
EO2	0.436	0.683	0.521			
EO3	0.511	0.757	0.554			
EO4	0.417	0.685	0.541			
EO5	0.517	0.739	0.525	0.81	0.81	0.51
SP2	0.591	0.594	0.775			
SP3	0.622	0.569	0.781			
SP4	0.646	0.575	0.801			
SP5	0.692	0.697	0.908			

ADP = E-learning adoption, EO = Entrepreneurial orientation, SP = Entrepreneurial orientation.

Additionally, following the recommendation of Podsakoff et al. (2003), we obtained responses for the independent and dependent variables from different respondents. Hence, we conclude that common method bias is not a concern (Tables 2 and 3).

Structural model assessment

After assessing the adequacy of the measurement model we proceeded to assess the structural model. In determining the significance of the path coefficients in the structural model, we followed the example of Sarstedt et al. (2017) and applied a bootstrap resampling procedure (with 5000 sub-samples). The result of the analysis suggests that entrepreneurial orientation ($\beta = 0.193$, $p < 0.001$) and strategic planning ($\beta = 0.565$, $p < 0.001$) have significant and positive influence on e-learning adoption thereby supporting H1 and H2. As predicted, strategic planning significantly mediates the relationship between entrepreneurial orientation and e-learning adoption. Hence the result shows that the indirect effect of entrepreneurial orientation of e-learning adoption is significant ($\beta = 0.359$, $p < 0.001$) supporting H3.

To describe the explanatory power of the structural model, the coefficient of determination R^2 was used to ascertain the predictability of the endogenous constructs. The results also show that both e-learning adoption ($R^2 = 0.492$) and strategic planning ($R^2 = 0.401$) have significant R^2 values.

According to Cohen (1988), the effect size impact indicator f^2 values of 0.02, 0.15, and 0.35, represent small, medium, and large effects, respectively. Thus, there is a relatively small effect size for the relationship between entrepreneurial orientation and e-learning adoption ($f^2 = 0.044$). The effect size for the relationship between strategic planning and e-learning adoption is large ($f^2 = 0.377$). Similarly, the relationship between entrepreneurial orientation and strategic planning also has a large effect size ($f^2 = 0.676$).

Finally, the predictive relevance Q^2 values are considered as weak ($0.02 \leq Q^2 < 0.15$), moderate ($0.15 \leq Q^2 < 0.35$) and strong effects ($Q^2 > 0.35$) (Henseler et al., 2009). We determine the predictive relevance of the model by using blindfolding procedure on SmartPLS. The results show that Q^2 values of the endogenous constructs have strong effects; e-learning adoption ($Q^2=0.562$), entrepreneurial orientation ($Q^2=0.389$) and strategic planning ($Q^2=0.573$), thereby supporting the predictive accuracy of the model (Table 4 and Figure 2).

DISCUSSION

Entrepreneurial orientation and e-learning adoption

As expected, the findings of the study indicate that entrepreneurial orientation has a positive influence on e-learning adoption ($\beta = 0.193$, $t = 3.522$, $p < 0.001$). Thus, Hypothesis (H1) is accepted. This finding is consistent with the literature which suggests that entrepreneurial orientation aid performance (Rauch et al., 2009). Entrepreneurial orientation enables institutions to pursue new concepts, products and process (Covin and Wales, 2012). Entrepreneurial orientation instigates changes in the activities of institutions especially with regards to technological changes and it enables institutions to take actions and initiatives that transform or extend their scope of operations into new domains. Thus, entrepreneurial orientation instigates institutions to adopt innovations such as e-learning especially in response to changes in the environment of higher education (Williams and Goldberg, 2005; Keats and Schmidt, 2007). However, relying only on entrepreneurial behaviour may not be enough for institutions to achieve the desired e-learning adoption effect. Although entrepreneurial orientation has strong predictive value ($Q^2= 0.389$), the effect size shows that the actual impact is small ($f^2= 0.044$). Thus, in order for entrepreneurial orientation to

Table 3. Testing discriminant validity using the HTMT ratio.

Factor	Mean	Std. Dev.	ADP	EO	SP
ADP	2.654	1.028			
EO	3.285	0.934	0.656		
SP	2.77	1.072	0.78	0.742	

ADP = E-learning adoption, EO = Entrepreneurial orientation, SP = Entrepreneurial orientation.

Table 4. Results of hypotheses testing.

Factor	Path coefficient	T Statistics	P-Value	Result
EO → ADP	0.193	3.522	0.000	Supported
EO → SP	0.635	16.144	0.000	Supported
SP → ADP	0.565	10.101	0.000	Supported
EO → SP → ADP	0.359	8.379	0.000	Supported

Model fit: SRMR = 0.043, NFI = 0.905.

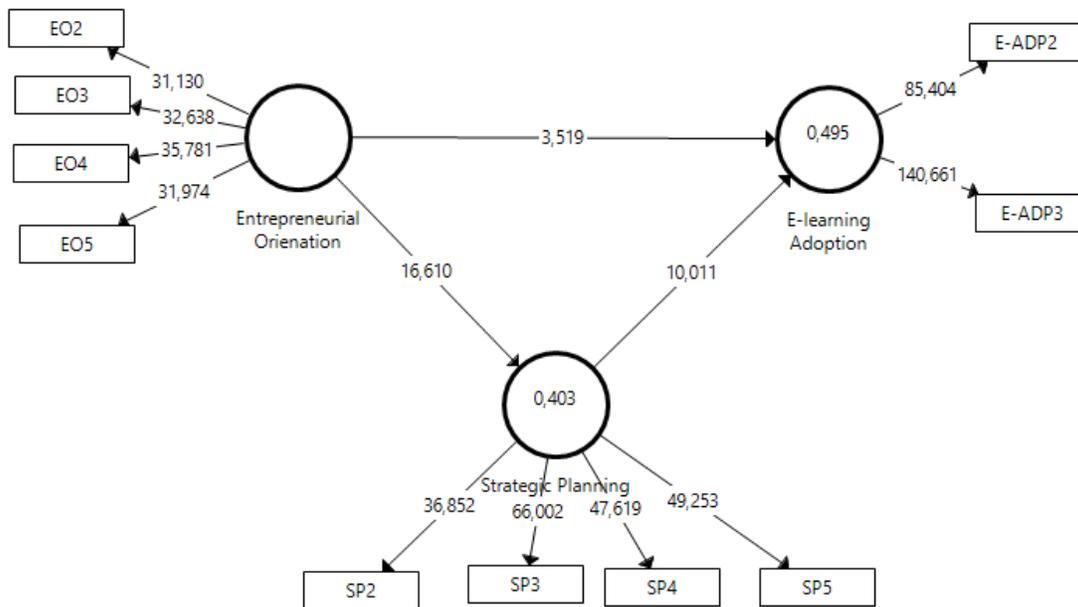


Figure 2. Path analysis showing strategic planning mediating the relationship between entrepreneurial orientation and e-learning.

have a large effect on e-learning adoption, there should be appropriate strategic e-learning plan.

Strategic planning and e-learning adoption

The findings of the study also show that strategic planning has significant impact on e-learning adoption ($\beta = 0.565, t = 10.101, p < 0.001$), thereby Hypothesis (H2) is accepted. This finding supports the argument that that strategic planning aid organizational performance (Owolabi

and Makinde, 2012; Tapinos et al., 2005; Song et al., 2011; Aboramadan and Borgonovi, 2016) especially in stable environments (Priem et al., 1995). Elements of strategic planning (such as e-learning policies, clear objectives/goals, implementation plans and performance evaluations) aid e-learning adoption by focusing the institutions’ effort on their e-learning plans. For example, e-learning policies and objectives provide guidance on the expected e-learning behaviour and performance expectations. E-learning implementation plans provide clearly defined e-learning activities, while evaluation

measures e-learning performance to ensure that the e-learning objectives are achieved. The findings of Sidhu and Gage (2021) also indicate that institutional plans (that is, strategic e-learning plans) aid the adoption of e-learning among academic staff in higher education institutions. Hence, strategic planning has a high predictive value ($Q^2 = 0.573$) and large effect ($f^2 = 0.676$) on e-learning adoption.

Entrepreneurial orientation, strategic planning and e-learning adoption

Hypothesis (H3) is also accepted. Strategic planning significantly mediates the relationship between entrepreneurial orientation and e-learning adoption ($\beta = 0.359$, $t = 8.379$, $p < 0.001$). Rigtering et al. (2017) also found that the combination of entrepreneurial orientation and strategic planning leads to high performance in organizations. Reflecting on the mediating effect of strategic planning, it makes logical sense that the combination of entrepreneurial orientation and strategic planning should significantly influence e-learning adoption; while entrepreneurial orientation motivates institutions towards e-learning adoption, strategic planning provides clearly defined actionable plans (Andersen, 2000; Camilleri, 2018; Elbanna et al., 2016) that guide e-learning implementation, thus leading to e-learning adoption.

Implication for managers

In this era of digital connectivity, exponential growth in the demand for higher education (Marginson, 2016) and borderless institutions (Kanniainen et al., 2021), the challenge before managers of higher education institutions especially in developing countries like Nigeria is to understand the trend in global higher education market (Zeca, 2021) and find ways of embracing the opportunities offered by the changing technological environment of higher education orchestrated by e-learning. The findings of this study provide managers of higher education institutions a better understanding of the factors influencing e-learning adoption in their institutions. Hence, this study broadens the perception of managers with regards to the determinants of e-learning adoption. Rather than focusing only on inadequate e-learning infrastructure, knowledge gap and behavioral barriers, this study enables managers to examine the level of entrepreneurial behaviour in their institution and how it aids or hinders innovation adoption. To successfully implement e-learning, managers should focus more on strategic planning without losing sight of other factors that influence e-learning adoption (Algahtani, 2011; Ali and Magalhaes, 2008; Jones, 2004; Rakhyoot, 2017; Sanga et al., 2013; Sife et al., 2007; Unwin et al., 2010).

Using higher education institutions in Nigeria as an example, the critical issue before managers is on how to foster entrepreneurial institutions that are adaptive to the evolving environment of higher education (Kanniainen et al., 2021; Zeca, 2021). Equally important is the need for managers to develop strategic e-learning plans that motivate e-learning adoption through clearly defined e-learning policies, objectives, implementation and evaluations.

Conclusion

The e-learning literature identified several factors that hinders the adoption of e-learning in higher education institutions (Algahtani, 2011; Ali and Magalhaes, 2008; Folorunso et al., 2006; Kisanga and Ireson, 2015; Mtebe and Raisamo, 2014). However, there seems to be no study that has investigated e-learning adoption barriers from an entrepreneurial and strategy perspective. This study attempts to fill this gap and contribute to our understanding of e-learning adoption barriers in several ways. First, we reframed the challenges of e-learning adoption in higher education institutions as an entrepreneurial and a strategic planning problem. Conceptualizing e-learning adoption barriers from this perspective provides a broader understanding of the determinants of e-learning adoption in higher education institutions. Second, the study contributes to knowledge by bridging e-learning, entrepreneurial orientation and strategic planning literature to investigate e-learning adoption barriers. Third, the study also contributes to practice by drawing the attention of managers of higher education institutions to the significant roles played by entrepreneurial orientation and strategic planning with regards to e-learning adoption.

Limitations and suggestions for future research

This study focused on entrepreneurial orientation as a unidimensional construct without considering its five dimensions (Lumpkin and Dess, 1996; Miller, 1983). Several studies suggest that the five dimensions of entrepreneurial orientation may have different and unique impact on an organization's performance (Astrini et al., 2020; Brettel et al., 2015; Craig et al., 2014; Dai et al., 2014; Kreiser and Davis, 2010). Thus, future studies could investigate the differential effect of each dimension of entrepreneurial orientation on e-learning adoption. The study employed a cross sectional survey method to examine e-learning adoption barriers. Future studies may adopt a longitudinal approach to examine the barriers faced by institutions especially during the implementation stage of e-learning. Longitudinal approach may provide more insight into specific e-learning implementation barriers. Additionally, the study only establishes that both

entrepreneurial orientation and strategic planning are predictors of e-learning adoption. Future studies may investigate these issues to provide managers with strategic planning tools that may aid e-learning adoption in their institutions.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interest.

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