



DIGITAL TEACHING SKILLS AND MANAGEMENT OF STUDENT-TEACHERS IN HIGHER INSTITUTIONS

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ABSTRACT

Objectives: Digital proficiency is one of the most essential skills educators must possess in the modern world, as it is becoming increasingly significant in the classroom. While most existing models and frameworks focus on the pre-university level, there is growing interest in the digital competencies of university lecturers—defined as the combination of knowledge, skills, and attitudes required to use technology effectively in teaching. This study examined the relationship between digital teaching skills and the management of student-teachers in higher education institutions in Nigeria. A structured survey was used to collect quantitative data for the study. The target population comprised undergraduate students from the faculties of education in public universities in Kwara State, Nigeria.. The data were analysed using SmartPLS tools.

Results: The findings suggest that the management of student-teacher relationships in higher education institutions is significantly influenced by effective digital teaching skills, such as the use of Learning Management Systems (LMS), a student-centric approach, and networking.

Conclusions: The study's conclusions show that learning management systems (LMS), student-centric approaches, networking, and the development of future instructors in higher institutions have a good and significant association.

Implication: According to the study, to increase the quality of future teachers in higher education, school administrators should keep pushing lecturers to use LMS, student-centric approaches, and networking effectively.

Novelty/Original: This study provides evidence that digital teaching skills (learning management systems and networking) have a positive relationship with the management of student-teachers. This study also sheds light on how student-centric approaches can enhance the management of student-teachers in higher institutions.

KEYWORDS: Digital, LMS, Student-centric approach, Higher educational institution

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1. INTRODUCTION

The introduction of digital technologies has led to a significant shift in the educational landscape in recent years. Higher education institutions are increasingly recognizing the significance of digital teaching skills for student teachers (Hurtado-Mazeyra et al, 2022). As the educational environment becomes more technology-driven, it is crucial to investigate how the enhancement of digital teaching skills among student teachers can contribute to their professional development and, consequently, to improved learning outcomes for students. As higher education strives to prepare future educators, understanding and enhancing digital teaching skills among student teachers emerge as crucial components for the advancement of pedagogical practices and the overall improvement of student learning experiences (Burkholder and Krauskopf, 2022).

The emergence of the digital age has brought forth an unparalleled period of connectedness and information availability (Rodríguez-García et al., 2019). In the realm of education, this digital revolution has prompted a paradigm shift in teaching methodologies and necessitated a re-evaluation of the skills required for effective pedagogy. Student teachers, positioned at the forefront of this educational transformation, are tasked with the responsibility of not only mastering traditional teaching methods but also adapting to the dynamic demands of the digital age (Otero et al., 2021).

Digital teaching skills refer to the skills, knowledge, and abilities that educators need to effectively leverage digital technologies in the teaching and learning process (Humphreys, 2023). These competencies have become increasingly essential in modern education as technology plays a significant role in shaping how information is delivered, accessed, and shared. Digital teaching skills are dynamic and continually evolving as technology advances. Educators with a strong foundation in these skills are better equipped to create engaging and effective learning environments for their students in the digital age (Fernández-Batanero et al., 2021).

Digital teaching skills can be viewed as the set of knowledge, competencies, and attitudes that educators

possess to integrate technology into their teaching practices effectively (Molina et al., 2021). In the modern era, where technology plays a significant role in education, digital teaching competence has become essential for educators to meet the diverse needs of students and prepare them for the demands of the digital age. This competence extends beyond basic technical skills and encompasses the ability to use digital tools strategically to enhance teaching and learning experiences (Abdullahi and Tijani, 2019; Mykhnenko, 2016). In this study, digital teaching skills refer to a learning management system, a student-centric approach, and networking.

Learning Management System (LMS) is a software platform designed to manage and facilitate the administration, delivery, and tracking of educational content and training programmes. LMS is widely used in various educational settings, including schools, universities, corporate training, and online learning environments (Abdullahi, 2020). Learning Management Systems play a crucial role in modern education, offering a centralized and efficient way to manage and deliver educational content (Cavas, 2015; Marissa et al, 2020). They contribute to the digitization of education, providing a streamlined and interactive learning experience for a diverse range of users (Zanjani et al, 2016).

A Student-Centric Approach in education refers to a philosophy, strategy, or instructional methodology that prioritizes the individual needs, preferences, and learning styles of students. In a student-centric approach, the focus shifts from a traditional, teacher-centred model to one that revolves around the learners. This approach recognizes that students are unique individuals with varying abilities, interests, and ways of learning, and it aims to tailor educational experiences to meet their specific needs (Nuñez Enriquez et al., 2021; Murphy et al., 2021). A Student-Centric Approach recognizes that students are active participants in their learning journey, aiming to create an environment that empowers students to thrive academically, socially, and emotionally (Dagago and Kaino, 2015). It emphasizes the importance of tailoring education to meet the diverse needs of individual learners, promoting a more inclusive and effective educational experience.

Networking involves establishing and nurturing professional relationships with others to exchange information, resources, and support. It is a proactive and strategic approach to building a web of connections that can offer various benefits, such as career opportunities, knowledge sharing, and business growth (Mozhaeva, 2014; Noskova & Pavlova, 2011). The goal is to make information and resources inclusive and understandable to people with various linguistic backgrounds, thereby reducing language barriers and promoting equal access to services.

Student-teacher refers to an individual who has the capacity, aptitude, or qualifications to become a teacher but may not be currently engaged in the profession (Tang 2023). It suggests that the person possesses the necessary attributes, such as knowledge, skills, and interpersonal abilities essential for effective teaching. A student pursuing a teaching profession may be in the process of completing their education or training, or they may be considering a career change to enter the teaching profession. In a broader sense, students pursuing the teaching profession can also encompass individuals who may not have formal qualifications but have a natural ability and passion for sharing knowledge and facilitating learning. It implies that with the right opportunities, support, and development, the individual has the potential to excel as an educator (Abdigapbarova & Zhiyenbayeva, 2023). Improvement of students pursuing the teaching profession in this study refers to the achievement of leadership skills and Passion for Learning and Teaching.

Leadership skills encompass a set of qualities and abilities that individuals possess to effectively guide, inspire, and influence others toward achieving common goals and objectives. These skills are not limited to specific roles or positions; they can be demonstrated in various contexts, including professional settings, community involvement, and educational environments (Kin and Kareem, 2019). Leadership skills are often considered essential for individuals in managerial or supervisory roles, but they are also valuable for anyone looking to make a positive impact on a group or organization. Leadership skills about teaching" refer to the set of abilities and qualities that educators possess to effectively guide, inspire, and

influence students, colleagues, and the skills about teaching" refer to the set of abilities and qualities that educators possess to effectively guide, inspire, and influence students, colleagues, and the educational environment as a whole. In the context of teaching, leadership goes beyond traditional notions of authority and involves fostering a positive and dynamic learning environment (Yani, 2021).

Passion for Learning and Teaching refers to a profound and enthusiastic commitment that educators have towards the processes of acquiring knowledge themselves and facilitating the learning experiences of their students (Juliani, 2014). This passion involves a genuine and enduring love for learning, a continuous quest for personal and professional development, and a sincere dedication to instilling a similar enthusiasm for learning and others (Atikson and Sandwith, 2012). Educators with a passion for learning and teaching are driven by an intrinsic motivation to inspire and empower students, fostering an environment that encourages curiosity, critical thinking, and a lifelong love of education (Serin, 2017). This concept underscores the idea that effective teaching goes beyond the dissemination of information; it involves creating an engaging and transformative educational experience that ignites curiosity, nurtures intellectual growth, and contributes to the holistic development of individuals. Passionate educators often exhibit a strong sense of purpose, creativity, and adaptability in their teaching approaches, making a positive impact on the lives of their students and contributing to the broader educational community.

Numerous research studies have been conducted on digital skills and the improvement of higher education institutions. Molina et al. (2021) investigated digital teaching skills in a comparative study of higher education. The study used a quantitative methodology, descriptive, comparative, and explanatory level, with a population of 4440 students. The instrument was subjected to validity and reliability tests for both content and construct. The study's goal was to determine whether teachers at the various Senati headquarters located in Lima Metropolitan and Callao had significantly different digital competencies. The p-value (0,000) and F (11,819) in the main results

demonstrate that at least two population means disagree. This shows that Lima Cercado's headquarters performed better compared to the other headquarters.

Also, Díaz-García et al. (2023) focus on managing digital transformation digitally: a case study in a higher education institution. The paper seeks to delineate the primary drivers and enablers of digital transformation in higher education institutions. These findings indicate that to convert the existing conventional culture into a digital culture, the right technological advancements must be implemented along with the establishment of suitable channels for communication. The organization can adjust to evolving circumstances by implementing data-driven decision-making and cultivating a participative leadership approach. However, it is worth noting that none of the authors cited in this study specifically addressed the digital teaching skills and management of student-teachers. Additionally, previous studies did not emphasize the importance of a learning management system, student-centric Approach, and networking as essential variables for assessing digital teaching skills. The great variety in the geographic locations and regions covered by the available studies is another important gap that inspired this investigation. Therefore, this study aims to close the gaps left by other researchers.

Research aims and objectives

- a) Determine the significant relationship between Learning Management Systems (LMS) and management of student-teacher relationships in higher institutions.
- b) Examine the relationship between the Student-centric approach and management of student-teacher relationships in higher institutions.
- c) Determine the relationship between networking and management of student-teacher in higher institutions.

Theoretical Background

The Connectivism Theory by Corbett & Spinello (2020) served as the theoretical foundation for this investigation. A learning theory called connectivism

places a strong emphasis on the function of networks and connections in the learning process. Siemens (2005) correctly pointed out that popular educational theories must keep up with technology breakthroughs, affordances, and knowledge to stay relevant. While appreciating the benefits of various learning theories, including constructivism, behaviourism, and cognitivism, knowledge organization, linkages, and order must be given top priority in mediating learning. Students need to be proactive participants in a digital information system, using it to collaboratively build a knowledge base for both their community and themselves. In connectivism, recent trends in self-directed learning have proven noteworthy.

Siemens (2005) described the various paths and personas that lead to learning. He pointed out that learning is multimodal and that experiences, rather than formal schooling, are what shape it. He continues by highlighting the value of long-term learning and how technology shapes and mediates a variety of educational experiences. With a strong emphasis on knowledge organization (Wafa, 2022), students work together to acquire new abilities. In light of this notion, learning is not as strictly prescribed or stereotyped as it is in education; instead, different facets of learning should be left open-ended rather than guided in specific directions. Connectivism's critics argue that the theory overemphasizes technology and social networks while undervaluing other elements like motivation, individual variances in learning styles, and the teacher's role. However, proponents of the theory contend that connectivism is a fresh and cutting-edge method of teaching that recognizes how knowledge is evolving and how crucial technology is to modern society (Afroz-Alam, 2023). Connectivism posits that learning is a process that occurs within networks of people, resources, and technology, and it aligns with the idea of digital tools facilitating diverse and interconnected learning experiences (Serkan & Gürbüz, 2021). It places a strong emphasis on the connections and networks that learners create to access and construct knowledge.

According to connectivism, seeking out current knowledge and being able to weed out irrelevant and secondary information are two critical abilities that help in learning. In other words, according to Khatibi and

Fouladchang (2015), "the capacity to know is more critical than what is known." One of the key components of learning is the capacity to make decisions based on knowledge that has been obtained.

When applied to education, connectivism theory promotes learner autonomy, encouraging individuals to take control of their learning journey. Students become active participants in seeking and creating knowledge rather than passive recipients. It encourages the creation of networked learning environments where students can engage with a variety of resources, experts, and peers. Online platforms, social media, and collaborative tools facilitate these connections. Consequently, it offers valuable insights for educators aiming to develop and enhance their digital teaching skills. By incorporating frameworks such as LMS, a student-centric approach, and networking into professional development and instructional practices, educators can create engaging and effective digital learning experiences for their students. (See figure 1)

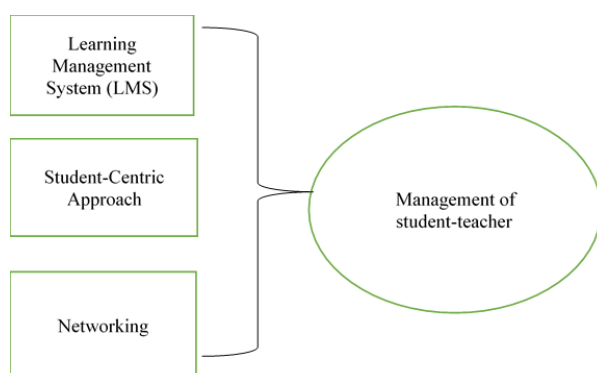


Figure 1: Author contribution

Connectivism theory, as applied to the management of digital teaching skills, involves leveraging the principles to create effective and meaningful learning experiences. Thus, this study is anchored on connectivism theory, which offers a valuable lens through which to understand learning in the digital age. By recognizing the interconnected and dynamic nature of knowledge, educators can design learning experiences that empower learners to navigate, adapt, and thrive in a rapidly evolving information landscape.

Research Hypotheses

The following hypotheses were created and put to the test:

- 1) There is no significant relationship between Learning Management Systems (LMS) and management of student-teacher in higher institutions
- 2) Student-centric approach is not significantly correlated with the management of student-teacher in higher institutions
- 3) There is no significant relationship between networking and management of student-teacher in higher institutions.
- 4) There is no significant relationship between digital teaching skills and management of student-teacher in higher institutions

2. METHODOLOGY

Research Design

This study takes a wholly quantitative method. Analyses using numerical data are known as quantitative data analyses, and they are used to either describe the current state of affairs or forecast future ones. It is possible to establish generalizable facts about a topic using this kind of analytical procedure. One benefit of utilizing quantitative data analysis is its ability to be interpreted through statistical analysis. Since statistics is a mathematical science, the quantitative method is regarded as rational and objective by scientists. Mugenda and Mugenda (2013) and Neuman (2013; Sekaran & Bougie, 2016).

Population and Sampling Procedure

A total of 400 students were selected based on convenience from the Faculty of Education, and 355 students responded to the survey. Some questions were eliminated during data cleaning because they were deemed inappropriate for use in the end. 350 questionnaires were utilized in this research. There were 25 questions on the study's questionnaire. Based on this, the study progressed with 350 correctly answered questionnaires, yielding a response rate was 355/400 for the final assessment of the study hypotheses.

Measures

In this investigation, the questionnaire approach was utilized, which consisted of 26 statements about five constructs (Learning Management System, student-centric, networking, leadership skills, and passion for learning and teaching). The instrument was validated by two experts in the Department of Educational Management and the Text and Measurement Department. A research instrument can be viewed as a set of questions and extra incentives designed to get the required information from the targeted responders. Cronbach's alpha (α) is a metric that quantifies how well a set of items (such as test statements or survey questions) assess the same underlying notion or construct. Six items captured the learning management system ($\alpha = .84$). Five items captured student-centric ($\alpha = .77$). Also, six items captured networking ($\alpha = .87$). Finally, eight items captured management of student-teachers ($\alpha = .89$).

All were measured using a four-point Likert scale, 1 was for strongly disagree, 2 for disagree, 3 for agree, and 4 for strongly agree was used. This method of collecting data. The decision to employ a 4-point Likert scale was based on the findings of Mayer (2013), Miller et al (2013), and Diamantopoulos et al. (2012), suggesting that this scale offers a quicker and simpler response format compared to scales with 5 to 7 points.

Independent variables

Learning management system

A learning management system (LMS) refers to a piece of software that facilitates the administration, delivery, and monitoring of online training and learning programmes for businesses and academic institutions. With only one platform, users can design courses, distribute content, monitor progress, and evaluate results. In essence, it functions similarly to a user-accessible virtual classroom with arranged learning resources and activities. The six items used to test LMS were modified from Abdullahi (2020, p. 9). The items underwent modifications to align with the framework of managing digital teaching skills. The scale's items had sufficient internal consistency, with its 0.846 Cronbach's alpha and 0.887 composite reliability values.

Student-Centric approach

Student-Centric Approach refers to a teaching method that focuses on the needs and interests of individual students, allowing learners to take an active role in their learning process. It emphasizes personalized learning experiences and tailoring education to meet the unique needs of each student. The student-centric Approach was measured using a six-item scale developed by (Nuñez Enriquez et al., 2021; Murphy et al., 2021) to measure SCA. Cronbach's alpha value was 0.774, and composite reliability was 0.845.

Networking

Networking is the process of establishing connections between computers and other devices to exchange data and resources. Devices may share files, connect to the internet, and communicate with one another. Networking essentially makes it possible for devices to cooperate and efficiently share information. Using a five-item scale adapted from Noskova and Pavlova (2011) to measure networking. With a Cronbach's alpha score of 0.897 and a composite reliability of 0.908, the construct demonstrated adequate reliability.

Dependent variable- Management of Student-teachers

Management of student-teachers refers to the process of enhancing the skills, knowledge, and abilities of a student-teacher to reach their full potential in their profession. It involves providing training, support, and resources to help teachers become more effective in their roles. Management of student-teacher was measured using nine items adapted from Kin and Kareem (2019) on achievement of leadership skills, with five items, and Juliani (2014) on a passion for learning and teaching, with four items. Cronbach's alpha was 0.892, and composite reliability was 0.913, indicating that the construct exhibited sufficient reliability.

Data collection technique

Data were collected through the distribution of an electronic survey. The survey included an informed consent section, which allowed participants to voluntarily decide whether to take part in the study. All

participants consented freely, with the assurance that they could withdraw at any time without facing any negative consequences. A total of 355 responses were received, and 350 of these were deemed suitable for analysis. To protect participant privacy and ensure data security, the survey did not collect any personally identifiable information. This approach aligns with ethical research guidelines as outlined by Choy (2014) and Dillman et al. (2014).

Data analysis

To evaluate the preliminary relationships between the research variables, SmartPLS was chosen to facilitate an examination of relationships in parallel. The current study's objectives and questions led to the selection of SmartPLS as an effective method for testing the hypotheses. The goal of the reflective measurement model evaluation is to test the validity and reliability of construct measures to provide evidence that their inclusion in the path model is suitable. Convergent validity, indicator reliability, discriminant validity, and composite reliability are the fundamental prerequisites of the reflective measurement paradigm. Structural equation modelling studies can be applied to reflective constructs if all of these requirements are satisfied (Hair, Sarstedt, Ringle, & Gudergan, 2019). In addition, Path coefficients and the coefficient of determination (R²) are evaluated for the structural model. Thus, the measurement and structural modeling test thresholds. SmartPLS comes with a wide range of tools and subroutines for formative and reflective assessments as well as structural models, like goodness of fit, bootstrap-based significance testing, PLS prediction, and the heterotrait-monotrait (HTMT) criterion. Also, it makes it possible to perform extra statistical studies, including tetrad analysis confirmation. Among the methods are latent class segmentation, importance-performance map analysis, and higher-order models. The measuring model had to be made in the first place. Testing is done for discriminant validity, convergent validity, construct validity, and reliability. To test the hypothesis, a second structural model is developed (Hair et al., 2017). Table 1, which also includes the indications and suggested thresholds for the measurement and structure modeling tests, explains the two phases involved in Partial Least Squares Structural Equation Modeling (PLS-SEM).

Table 1: An Overview of the Measurement and Structural Model Testing Procedures

	Measurement model tests	Structural model tests
Model criterion	Reliability Loading > 0.70 indicates dependability (Hair et al., 2014; Sarstedt et al., 2021).	The endogenous R ² range was 0-1. (Hair et al., 2017; Wong, 2013)
	The dependability of internal consistency ranges from 0.60 to 0.70 (Hair et al., 2017; Sarstedt et al., 2021).	Hair et al. (2014) and Sarstedt et al. (2021) describe path coefficients, also known as bootstrapping values, and t-values (1.96).
	According to (Hair et al., 2017), Convergent validity AVE > 0.50	Impact Size f ² according to Sarstedt et al. (2021 research, it will be tiny at a value of 0.02, medium at 0.15, and big at 0.35.
	Discriminant Validity AVE. Fornell-Larcker standard (Sarstedt et al., 2021)	

Adapted from (Jalal & Fakhrul, 2023)

3. RESULT

Measurement model assessment

A measurement model is typically evaluated to ensure validity and accuracy (Hair et al., 2021). The construct's reliability is evaluated using the composite reliability measure, which needs to be higher than 0.7 (Hair et al., 2019). Likewise, when each item's loading estimate is more than 0.6 of the factor's loading, a measurement model shows adequate indicator reliability. Also, there must be a greater than 0.5 AVE (Sarstedt et al., 2021). Table 2 and Figure 2 present the aforementioned results (See Table 2 and Figure 2).

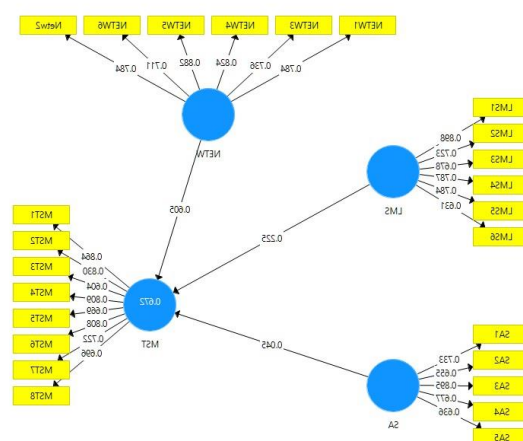


Figure 2: Construct Measurement Model

Table 2: Summary of Measurement Model (Construct Reliability and Validity) ($p < 0.01$)

Constructs	Item/statement	Factor loading	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
Learning Management System (LMS)	1. LMS facilitates flexible learning schedules.	0.898	0.846	0.887	0.570
	2. LMS offers robust analytics and reporting tools to track learner progress.	0.723			
	3. LMS reduces the need for physical resources.	0.678			
	4. LMS fosters a collaborative environment where students can exchange ideas, experience, and feedback	0.787			
	5. LMS platforms support self-paced learning to align academic work with field placement or teaching practice.	0.784			
	6. Helps students build the skills and knowledge necessary to succeed in both their studies and future teaching careers.	0.631			
Student-centric Approach (SCA)	1. SCA promotes a deeper understanding of the subject matter and maximizes academic success.	0.733	0.774	0.845	0.526
	2. SCA creates a positive and inclusive learning environment.	0.655			
	3. SCA promotes the development of critical thinking skills and problem-solving abilities.	0.894			
	4. SCA encourages open communication between educators and students.	0.677			
	5. SCA encourages active participation, leading to better understanding and retention.	0.636			

Networking (NET)	1. networking facilitates mentorship relationships by allowing students to seek guidance.	0.784	0.897	0.908	0.622
	2. opens the door to professional growth opportunities.	0.784			
	3. encourages continuous improvement practices.	0.736			
	4. helps students build peer support groups, improving teamwork and leadership skills	0.824			
	5. helps to gain new insights and stay updated on the latest trends	0.882			
	6. help the student build a personal brand and be more visible in their professional community	0.711			
Management of Student-teacher (MST)	1. promotes a passion for learning.	0.864	0.892	0.913	0.570
	2. encourages leadership skills in coordinating activities.	0.830			
	3. enhances the ability to identify challenges in the learning process.	0.604			
	4. inspire and motivate students to achieve their best and foster a positive attitude toward learning.	0.809			
	5. create a well-structured and conducive learning environment.	0.669			
	6. help students learn self-discipline, time management, and responsibility	0.808			
	7. helps to minimize the likelihood of conflicts and behavioural problems	0.722			
	8. fosters respect and trust between lecturers and students.	0.696			

Cronbach's Alpha and Composite Reliability (CR) were used to determine construct reliability. Table 3 displays the convergent validity and construct reliability for each concept. For every construct, the Cronbach alpha and CR values are above the suggested threshold of 0.600 for the entire sample (Flake, 2022). Convergent validity is supported by the Average Variance Extracted (AVE) for the constructs exceeding 0.500 for the whole of the sample (Hair et al., 2020) (See Table 3).

Table 3: Construct Reliability and Validity ($p < 0.01$)

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
MST	0.892	0.913	0.570
LMS	0.846	0.887	0.570
NETW	0.879	0.908	0.622
SA	0.774	0.845	0.526

Moreover, the discriminant validity of the construct was evaluated using the HTMT and the Fornell and Lacker criteria. Since the HTMT criteria compute the geometric mean of the average correlations between indicators measuring the same construct and the mean of all correlations between indicators measuring different constructs, they are regarded as reliable for determining discriminant validity (Ab Hamid et al, 2017). Table 4 displays the HTMT values. If this measure's values are less than 0.85, it indicates that the variables are not the same. Also, it can be concluded that this data has no issue of discrimination and convergent validity, showing that the data has been collected fine because HTMT is not greater than 0.85. HTMT is the latest criterion for testing discriminant validity based on internal and external correlation (See Table 4).

Table 4: HTMT values of the construct

	LMS	MST	NETW	SA
LMS				
MST	0.799			
NETW	0.855	0.849		
SA	0.768	0.671	0.714	

The Fornell and Lacker criterion was also evaluated in the second stage to evaluate in-depth discriminant validity. The diagonals represent the square root of the AVEs, and it ought to be greater than the correlation between their variables. Table 5 diagonal values are greater than their corresponding values, which satisfies the Fornell and Lacker requirements and maintains discriminant validity (See Table 5).

Table 5: Fornell and Lacker criterion

	LMS	MST	NETW	SA
LMS	0.755			
MST	0.713	0.755		
NETW	0.750	0.701	0.789	
SA	0.717	0.596	0.623	0.725

Evaluation of the Structural Model

The structural model is presented graphically in Figure 4. This figure illustrates the directional paths between the study's constructs, based on the hypothesized relationships proposed in the conceptual framework. The single-headed arrows in the diagram represent the hypothesized causal directions and are used to assess the significance of the conceptual model. Factor loadings for each observed item are displayed in Figure 3.

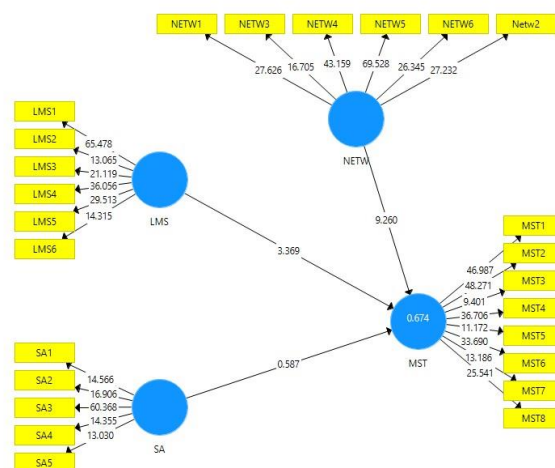


Figure 3: Structural Model of the Study (Bootstrapping @5000)

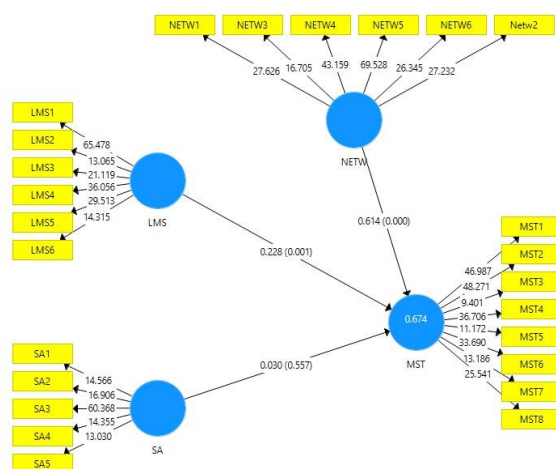


Figure 4: Structural Model of the Study

The results of the structural model confirmed all hypothesized relationships using standardized coefficients. Specifically, the Learning Management System showed a significant positive relationship with the management of student-teachers ($\beta = 0.228$, $p < 0.001$), supporting Hypothesis 1. In contrast, student autonomy (SA) did not exhibit a significant relationship with the management of student-teachers ($\beta = 0.030$, $p = 0.557$), indicating that Hypothesis 2 was not supported. Additionally, networking was found to have a strong positive relationship with the development of students pursuing the teaching profession ($\beta = 0.614$, $p < 0.001$), confirming Hypothesis 3.

Quality of fits

According to recommendations in the literature, a goodness-of-fit test should be conducted as a subsequent step in evaluating the structural model. This test assesses the overall fit of the model and helps identify and eliminate redundant information or anomalies. In SMART-PLS, model fit is assessed using the Standardized Root Mean Square Residual (SRMR) and Root Mean Square Theta (RMS-theta).

Research suggests that an SRMR value of zero represents a perfect fit; however, values less than or equal to 0.08 are generally considered acceptable. Similarly, for RMS-theta, a value close to 0.12 is indicative of a good model fit. In the current study, both SRMR and RMS-theta values fall within the

acceptable thresholds, indicating that the model demonstrates a good fit and is suitable for analysing and predicting the relationships among the study's constructs. The specific goodness-of-fit values are presented in Table 6 (see Table 6).

Table 6: Quality of Fits

Goodness of fit	Value	Rule of thumb	Justification	Interpretation
SRMR	.06	<.08	Tuksino (2016)	Fulfill
RMS-theta	.05	<.07	Steiger (2007)	Fulfill
CFI	.95	>.90	Hair, et. al (2013)	Fulfill
TLI	.96	>.90	Awang (2015)	Fulfill
d_ULS	.06	<.08	Hair, et. al (2013)	Fulfill
d_G	.09	<.10	Hair, et. al (2013)	Fulfill
Chisq/df	3.22	<.5.0	Awang (2015)	Fulfill

Hypothesis to be tested (See Figures 3 &4)

Table 7 presents the results indicating a significant relationship between the Learning Management System (LMS) and the Management of Student-Teachers (MST), with a standardized coefficient (β) of 0.228, a p-value of 0.001 ($p < 0.05$), and a t-value exceeding the critical threshold of 1.96. In contrast, Student Autonomy (SA) did not show a significant effect on MST. Although the t-value was above 1.96, the corresponding β value was 0.030, and the p-value was 0.557 ($p > 0.05$), indicating the relationship is not statistically significant.

Additionally, there was a strong and significant relationship between Networking (NET) and MST, with a p-value of 0.000 ($p < 0.05$) and a t-value of 0.614, which also exceeds the critical value of 1.96. These findings support the proposed hypotheses, as the constructs, except for the student-centric approach, demonstrated significant contributions to the development of students pursuing careers in teaching. Each significant construct reported a β value greater than the accepted threshold of 0.10 and t-statistics above 1.96, indicating a meaningful dependency of the dependent variable on the independent variables. In

conclusion, the data support the validity of the hypothesized relationships, except for the Student-centric approach, which did not exhibit a statistically significant effect on management of student-teachers (see Table 7).

Table 7: Result of Structural Model (Path Coefficient)

Hypotheses	Original sample (Beta)	Standard Deviation (STDEV)	t-Value	P Value	Decision
LMS->MST	0.228	0.068	3.369	0.001	Supported
SA ->MST	0.030	0.051	0.587	0.557	Not Supported
NETW ->MST	0.614	0.066	9.260	0.000	Supported

Note: *t-value > $\alpha=0.05$, **t-value > $\alpha=0.01$ with two tailed test

The learning theory of connectivism is appropriate for the digital age. It highlights that learning happens through connections made both within and between various knowledge sources and that these connections are mostly made possible by technology. The connectivism theory supports the three factors in a way that promotes efficient student-teacher management. By providing platforms that let students interact with a variety of materials, learning management systems (LMSs) offer an excellent framework for putting connectivism's ideas into practice (text, videos, forums, databases). As suggested by connectivism allows students to engage with one another, exchange ideas, and develop networks to collaboratively create new knowledge.

A student-centric approach is naturally supported by connectivism, which encourages learner autonomy and accountability for their education. Also, in a student-centric approach, students can take charge of their education by choosing and investigating the links or resources that best fit their needs and interests. By putting students at the centre of an active learning environment where they can learn from peers and instructors alike, connectivism promotes learning from others within a network.

A key central component of connectivism is networking, which is in line with contemporary

methods of teaching, especially in online environments. According to connectivism, networking enables students to connect with classmates, experts, and resources outside of their immediate surroundings, promoting learning through a variety of channels. Students who network are exposed to a greater range of ideas, viewpoints, and experiences, which improves their capacity to comprehend difficult ideas and work cooperatively to solve challenges. Online networks' dynamic nature allows students to interact with peers, fresh material, and ideas constantly, which supports connectivism's premise that knowledge is always changing.

4. DISCUSSION

The purpose of this research was to investigate the relationship between digital teaching skills and management of student-teachers in higher institutions in Nigeria. Digital teaching skill has a positive impact on the management of student-teachers. It is likely said that if digital teaching skills are effective and well managed, they can positively enhance the improvement and performance of students pursuing the teaching profession. In line with the research findings of Fernández-Batanero et al. (2021) and Molina et al (2023), digital technologies serve as pedagogical instruments that foster creativity and offer crucial support for learning when it comes to implementing tailored educational interventions. As per the findings of this study, school administrators can focus more on the effective use of digital teaching platforms such as Learning Management Systems (LMS), student-centric approaches, and networking systems.

This study demonstrates that there is a positive relationship between LMS and MST (Cavus, 2015) specifically, the results suggest that using the LMS platform for teaching facilitates flexible learning schedules, reduces the need for physical resources, ensures consistency in training and educational content as well as provide a standardized approach that helps maintain quality and compliance with educational standards. Kasim and Khalid (2016) claimed that learning management systems (LMSs) are an efficient approach to impart knowledge to learners by providing students with round-the-clock access to course

materials and making course construction and administration easy for teachers. Bradley (2021); and Edebatu et al. (2019) found that LMS are significant because they have features that will make learning more engaging and dynamic for students. They also help to foster a competitive atmosphere and offer a range of course presentation formats that use texts, graphics, images, videos, and presentations to explain concepts, which makes it easier for students to understand the courses. This finding concurred with (Abdullahi, 2020; Kehrwald and Parker, 2019; Díaz-García et al., 2023; and Turnbull et al., 2019) that LMSs allow users to independently fill their emerging needs by communicating with others and checking their progress. However, the findings of this study also remind school managers to encourage the use of LMS while teaching to effectively improve students pursuing teaching professionals' performance in digital skills.

Also, the findings of this study show that student-centric learning has a positive and significant relationship with MST such that it promotes a deeper understanding of the subject matter and maximizes academic success, fosters a sense of autonomy and responsibility for students' learning, creates a positive and inclusive learning environment as well as encourages open communication between educators and students. Tang (2023) claims that Technology usage for research, interactions, gamification, simulations, and feedback is intimately associated with student-centric approaches. Abdigapbarova and Zhiyenbayeva (2023) discovered that students design the learning process in student-centred learning, while teachers' roles are to provide information and make modifications.

The lack of a significant correlation between the student-centric approach and management of student-teachers in higher institutions may stem from the fact that higher institutions often focus on maintaining standards, complying with accreditation requirements, and fulfilling organizational goals. A purely student-centric approach might not align with these institutional priorities, as it may prioritize individual needs over systemic objectives like uniform assessment standards and teaching methodologies. While a student-centric approach emphasizes individual learning needs, management must also ensure academic rigor and

consistency across student-teachers. Focusing solely on individual preferences might lower standards, compromising the quality of teacher education. A student-centric approach might necessitate more personalized instruction and resources in large classrooms or in institutions with limited staff and equipment, which might not be feasible. A vital part of professional development for student-teachers, who are future educators, is comprehending the greater educational context. A student-centric approach might prioritize addressing individual needs over assisting students in developing the independence and responsibility required to manage diverse classes. It might be challenging to use a student-centric approach at the institutional level since student-teachers have diverse needs, backgrounds, and learning preferences. It could be difficult to manage this diversity and uphold equity and fairness while implementing the strategy. Due to the need to balance institutional interests, uphold academic rigour, and deal with resource constraints, the student-centric approach may therefore be less important in managing student-teachers in higher education, even though it encourages individualized learning.

Furthermore, this finding reveals that networking strongly has a significant relationship with MST. As a result, it facilitates mentorship relationships by allowing students to seek guidance, opens doors to professional growth opportunities, encourages the sharing of information, updates, and relevant educational resources, as well as enhances continuous improvement in students' teaching practices. Boronenko (2018) discovered that networking facilitates the exchange of best practices, supports teacher professional development, helps schools expand their capacity, functions as a middleman between centrally planned and decentralized systems, and aids in the process of reorganizing and reshaping educational institutions and systems.

Implications and Limitations of the Study

Indeed, according to the results, digital teaching skills have a significant impact on the management of student-teachers. School administrators and lecturers can then continue to create effective avenues for the encouragement of digital teaching platforms toward

improving students pursuing the teaching profession. Differently, the findings of this study provide new information to the government to provide necessary resources that will aid the effective use of digital teaching platforms to enhance the digital teaching skills of students pursuing the teaching profession in higher education institutions in Nigeria. This study was constrained in several ways, which means that its limits must also be addressed. To get more thorough findings, this research has to be improved and combined. This cross-sectional quantitative survey should be used in conjunction with other approaches to enhance the understanding of student pursuing the teaching profession and their management of digital teaching skills. Thus, qualitative research is also recommended as an improvement to get more detailed information about the reasons behind the findings.

5. CONCLUSION

Based on the findings, it has been determined that effective management of digital teaching skills can help aspiring educators develop their leadership and teaching capacities. Additionally, the conceptual understanding of the relationship between the three independent variables (learning management system, student-centric, and networking) was addressed. These factors have the potential to further the development of aspiring educators at higher education institutions.

Conflict of interest

There is no conflict of interest to state, according to the authors.

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