

Exploring the Intersection of Technology Adoption and Employee Engagement among Teaching Staff at a Private University

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ABSTRACT: This study examined the intersection between technology adoption and employee engagement among teaching staff at a private university. Utilizing the Diffusion of Innovations Theory, it uncovered the various factors that influence attitudes and behaviors toward technological integration. A cross-sectional survey was conducted, employing quantitative methods and secondary data analysis. The findings revealed that 65.11% of respondents were males, 34.88% were aged 56 years or above, 46.51% held Ph.D. degrees, and 81.39% were identified as Yoruba. Furthermore, 53.48% of participants indicated that the technologies adopted were aligned with their learning objectives, while 65.11% believed these technologies enhanced students' learning experiences. Additionally, 46.51% reported an increase in job satisfaction attributed to technology adoption. The study concludes that higher education institutions should prioritize the implementation of contemporary technologies, offer relevant training for staff development, and ensure a reliable Wi-Fi environment to facilitate teaching activities, thereby enabling staff to maintain global competitiveness.

KEYWORDS: Technology Adoption, Employee Engagement, Diffusion of Innovations Theory, Education Sector, Job Satisfaction

INTRODUCTION

Technology has significantly transformed various sectors of society, including education, at both local and global levels (Akinbo & Ogunfayo, 2023; Adeniyi & Omolawal, 2024). Within the educational domain, there is an increasing emphasis on technology adoption due to its capacity to enhance teaching and learning experiences (Emmanuel, 2024). Lecturers serve as pivotal actors within the educational ecosystem, and their role is critical in the successful integration of technology into classroom settings. Nevertheless, despite the burgeoning interest in technological advancements within education, there exists a notable gap in research concerning the factors that influence lecturers' adoption of technology and the subsequent impact on their engagement, particularly in the context of private universities in Nigeria. This gap in the literature creates an opportunity to investigate the factors that shape both technology adoption and employee engagement, as comprehending these dynamics is essential for maximizing the benefits of technological integration.

Employee engagement is a fundamental determinant of organizational success. It is defined as the extent of enthusiasm, involvement, and commitment that an individual exhibits towards their work (Saks, 2020). Central to the lecturers in private universities, elevated levels of engagement correlate with improved teaching quality, enhanced student outcomes, and a more favorable academic environment. Previous studies have indicated that engaged employees generally experience higher job satisfaction and augmented well-being (Wright & Cropanzano, 2017). Engaged lecturers tend to possess a stronger sense of purpose and pride in their work, influencing their readiness to adopt new technologies in their teaching practices. Furthermore, the integration of technology in educational environments has become increasingly linked with organizational sustainability, operational efficiency, and environmental accountability (Reyes-Fiol, 2017). Technology facilitates reductions in environmental impacts and streamlines operations, while simultaneously fostering innovation, rendering it an indispensable tool for modern educational institutions striving for sustainability. These advantages align with the broader global objective of ensuring inclusive and equitable quality education for all, as articulated in the United Nations' Sustainable Development Goal 4 (United Nations, 2015, 2020). In this regard, technology can play a vital role in enhancing educational access, equity, and quality, particularly for marginalized groups and individuals in remote locations (Kizito & Tuyisenge, 2018; Miao & Mishra, 2017).

Despite the expanding body of research on technology adoption, a significant theoretical gap persists in understanding how employee engagement specifically mediates or influences lecturers' adoption of technology in private universities in Nigeria. There has been insufficient exploration of the interaction between these two factors, technology adoption and employee engagement, and how they jointly affect teaching practices and academic performance. This situation raises the pertinent question: What factors

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influence both technology adoption and employee engagement among lecturers in private universities in Nigeria? To address this gap, the present study seeks to explore the relationship between technology adoption and employee engagement among lecturers in private universities in Nigeria. Although extensive research on technology adoption exists, including Davis's (1989) Technology Acceptance Model (TAM) and studies concerning self-efficacy and attitudes towards technology (Teo & Zhou, 2014; Venkatesh & Davis, 2000), there has been limited focus on how these factors intersect with employee engagement within the framework of higher education in Nigeria.

This study is designed to address three primary research questions: First, what factors influence lecturers' adoption of technology in private universities in Nigeria? Second, how does employee engagement impact technology adoption among lecturers within these institutions? Third, in what ways does the adoption of technology affect employee engagement among teaching staff in a private university context? By investigating these questions, this research aims to enhance the understanding of the interplay between employee engagement and technology adoption among lecturers. The insights derived from this study may offer practical guidance for educational institutions seeking to support lecturers in the effective integration of technology into their teaching practices.

The structure of the study is organized as follows: Following the introductory section, a comprehensive literature review will provide an overview of relevant theoretical frameworks and models related to technology adoption and employee engagement, including the Technology Acceptance Model (TAM) and the Theory of Planned Behavior (Fishbein & Ajzen, 1975). This review will further examine previous research concerning technology integration in educational settings, with a particular emphasis on private universities in developing countries, such as Nigeria.

The methodology section will detail the research design, sampling strategy, data collection methods, and analytical techniques utilized to address the research questions. This study will employ both qualitative and quantitative methods to gather data from lecturers at Lead City University in Southwest Nigeria. The results section will present the findings, which will then be discussed in relation to existing theoretical literature. Finally, the conclusion will summarize the key findings and provide recommendations for policy and practice aimed at enhancing technology adoption and employee engagement in private Nigerian universities. It will also identify areas for further research on this topic.

The significance of this study resides in its potential to bridge a crucial gap in understanding how technology adoption and employee engagement interact within the context of Nigerian private universities. By exploring these two constructs, the study seeks to provide valuable insights for universities aiming to assist lecturers in the adoption of technology, which could ultimately lead to improved teaching effectiveness, increased student engagement, and greater institutional success. Additionally, the findings could influence institutional policies at Lead City University and similar institutions across Nigeria, thereby establishing a framework for enhancing both technological integration and lecturer engagement.

This research also contributes to the broader global discourse regarding the role of technology in education, particularly in relation to the achievement of the United Nations Sustainable Development Goals (SDGs). By systematically investigating how employee engagement affects technology adoption, this study offers new perspectives on how educational institutions can overcome the challenges associated with technological integration while cultivating a more engaged and dedicated teaching workforce. Ultimately, this study seeks to fill the theoretical gap in the literature by examining the reciprocal relationship between technology adoption and employee engagement among lecturers in private universities in Nigeria. The findings will provide actionable recommendations to guide policymakers, administrators, and faculty members in enhancing both technology adoption and lecturer engagement, thereby improving the overall quality of education in the region.

LITERATURE REVIEW

This literature review aims to identify the factors that influence teaching staff's attitudes and behaviors towards technology. This analysis is based on an extensive examination of existing literature. Previous studies have highlighted various variables that affect technology adoption among educators, often analyzed within frameworks such as the Technology Acceptance Model (TAM), Diffusion of Innovations Theory, and other theoretical perspectives on employee engagement and technology adoption. Key factors identified include Perceived Usefulness, Perceived Ease of Use, Resistance to Change, Digital Literacy, and Perceived Organizational Support. These factors, both individually and collectively, impact educators' willingness to adopt and integrate technology into their teaching practices (Davis, 1989; Rogers, 2003; UNESCO, 2013). In order to explore how these factors interact, this paper presents a formal framework that conceptualizes these elements as Independent Variables (IVs), Mediating Variables (MVs), and Dependent Variables (DVs). These relationships are grounded in established theoretical frameworks and recent empirical findings.

Independent Variables (IVs)

Perceived Usefulness

Perceived Usefulness (PU) is a central concept in the Technology Acceptance Model (TAM). It refers to the extent to which an individual believes that using technology will enhance their performance (Davis, 1989). For educators, this belief may relate to the

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idea that technology will improve instructional effectiveness, increase student engagement, or streamline administrative tasks. Studies consistently show that PU is a significant predictor of technology adoption (Venkatesh & Davis, 2000).

Perceived Ease of Use

Perceived Ease of Use (PEOU) is another key element of TAM, referring to the degree to which an individual believes that using technology will be free of effort (Davis, 1989). Research indicates that when educators perceive technology as easy to use, their likelihood of adopting it increases. This is because ease of use reduces potential barriers to adoption and enhances engagement with the technology (Venkatesh et al., 2003).

Resistance to Change

Resistance to Change is a well-documented factor in the literature on technology adoption, particularly in education (Rogers, 2003). This concept suggests that individuals may resist new technologies due to concerns about disrupting established routines or a perceived loss of control. Research indicates that teaching staff with a high level of resistance to change are less likely to engage with new technology, even when it is perceived as useful (Venkatesh et al., 2003).

Digital Literacy

Digital literacy encompasses an individual's capacity to utilize digital technologies effectively and critically. It serves as a fundamental component that empowers educators to integrate technology into their pedagogical practices (UNESCO, 2013). Elevated levels of digital literacy are positively associated with increased technology adoption, as educators possessing advanced skills demonstrate greater capability and confidence in utilizing new tools (Singh, 2023).

Perceived Organizational Support

Perceived Organizational Support (POS) pertains to the belief that an institution values its employees and is concerned about their well-being (Eisenberger et al., 1986). For educators, POS significantly influences attitudes toward technology adoption. Support from the institution, encompassing access to resources, comprehensive training, and encouragement, fosters a conducive environment for the integration of technology into teaching practices. Research indicates that educators who perceive higher levels of organizational support are more inclined to engage with and adopt technological innovations (Eisenberger et al., 1986).

Mediating Variables (MVs)

Technology Confidence

Technology confidence reflects an individual's self-efficacy regarding their proficiency in employing technology effectively. It mediates the relationship between perceived usefulness and technology adoption. Enhanced technology confidence contributes to increased engagement with technology, especially when the technology is perceived as beneficial (Compeau & Higgins, 1995). Consequently, technology confidence is a pivotal factor in determining whether educators who view technology as advantageous will proceed with its adoption.

Workplace Learning Environment

The Workplace Learning Environment (WLE) holds a significant mediating role in the relationship between perceived organizational support and technology adoption. A supportive and positive learning environment aids educators in developing the requisite skills and confidence to utilize technology, thereby facilitating adoption. Settings that prioritize professional development and offer ongoing support can effectively mitigate challenges associated with technology integration (Singh, 2023).

Dependent Variable (DV)

Technology Adoption

Technology adoption refers to the decision of educators to incorporate and integrate technology into their teaching practices and administrative responsibilities. As a dependent variable, it is influenced by various factors, including perceived usefulness, perceived ease of use, and additional individual and organizational variables (Davis, 1989). Empirical studies have demonstrated that both individual attitudes and institutional factors significantly impact the likelihood of technology adoption within educational contexts (Venkatesh & Davis, 2000).

Proposed Relationships between IVs, MVs, and DV

1. Perceived Usefulness → Technology Confidence → Technology Adoption

Theory-driven Hypothesis: Educators who perceive technology as useful (independent variable) are more likely to cultivate higher levels of technology confidence (mediating variable), which subsequently leads to increased technology adoption (dependent variable). This relationship aligns with the Technology Acceptance Model (TAM), suggesting that perceived usefulness positively influences confidence in the use of technology, thereby facilitating its adoption (Venkatesh & Davis, 2000). Educators who acknowledge the advantages of technology are more likely to trust in their ability to utilize it effectively.

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2. Perceived Ease of Use → Technology Adoption

Theory-driven Hypothesis: Educators who regard technology as easy to utilize (independent variable) demonstrate a higher likelihood of adopting it (dependent variable). Davis (1989) asserts that the perceived ease of use is a fundamental determinant of technology adoption. Systems characterized by user-friendliness tend to result in elevated adoption rates.

3. Resistance to Change → Technology Adoption

Theory-driven Hypothesis: Resistance to change (independent variable) exerts a negative influence on technology adoption (dependent variable). This resistance represents a significant barrier to technology adoption, particularly within the educational sector (Rogers, 2003). Educators who exhibit resistance to change are less inclined to embrace new technologies, as they may consider them disruptive to their established practices.

4. Digital Literacy → Technology Adoption

Theory-driven Hypothesis: Elevated levels of digital literacy (independent variable) are positively correlated with technology adoption (dependent variable). Research indicates that educators possessing higher digital literacy are more likely to effectively integrate technology into their pedagogical practices, as they possess the requisite skills for proficient technology utilization (Singh, 2023).

5. Perceived Organizational Support → Technology Adoption

Theory-driven Hypothesis: An increase in perceived organizational support (independent variable) positively influences technology adoption (dependent variable). Institutional support, including training, resources, and encouragement, plays a pivotal role in facilitating technology adoption (Eisenberger et al., 1986).

Uniqueness of the Study Relationships

This study presents a novel perspective by synthesizing the constructs of perceived usefulness, resistance to change, and digital literacy within the context of higher education. Although previous research has examined these factors in isolation, this study integrates them into a cohesive framework that investigates their interactions and impact on technology adoption. Additionally, the study introduces perceived organizational support as a critical factor influencing technology adoption, thereby addressing a gap in the existing literature that considers both organizational and individual-level influences in a comprehensive manner.

RESEARCH METHODOLOGY

1. Population and Sample

This study targets the academic staff at Lead City University, situated in Ibadan, Oyo State, Nigeria. The focus is specifically on lecturers from various departments within the institution. A purposive sampling technique was adopted to ensure the inclusion of lecturers who are actively engaged in teaching and the integration of technological tools for educational purposes. A sample size of 200 lecturers was selected to achieve a representative outcome, considering the university's overall enrollment. The inclusion criteria for participation were limited to full-time academic staff who possess experience in utilizing technology within their teaching practices and who consented to take part in the survey. Non-teaching staff and individuals not involved in instructional roles were excluded from this study.

2. Study Design

A descriptive survey design was employed for this research, as it enables the collection of quantitative data from a substantial population, allowing for a comprehensive description of the relationship between technology adoption and employee engagement. This design was selected due to its capacity to elucidate the interactions among various variables, including the impact of technology adoption on job satisfaction, employee engagement, and academic performance. The study adopts a cross-sectional approach, meaning that data were collected at a single point in time from the chosen sample of teaching staff. The descriptive survey design is particularly appropriate for this research, as it facilitates the gathering of diverse perspectives and provides insights into contemporary trends in technology adoption and its influence on employee engagement.

3. Research Instruments

The primary instrument for data collection in this study is a structured questionnaire designed to evaluate the attitudes and behaviors of academic staff concerning technology adoption and employee engagement. The questionnaire is comprised of five sections: (1) demographic characteristics (including age, gender, and educational qualifications), (2) the extent of technology adoption by the academic staff, (3) perceived benefits of technology adoption, (4) the impact of technology on teaching and learning outcomes, and (5) employee engagement and job satisfaction. Likert-scale items ranging from "strongly agree" to "strongly disagree" were utilized to assess the respondents' opinions on various statements pertinent to the research objectives. The questionnaire underwent pre-testing with a small cohort of lecturers to ensure clarity and relevance in its design.

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4. Analysis Techniques

The data obtained from the questionnaires were analyzed using both descriptive and inferential statistical methods. Descriptive statistics, including frequency distributions, percentages, and means, were employed to summarize the demographic characteristics of the respondents and to provide an overview of their responses to key survey items. For the inferential analysis, the average percentage method was utilized to identify overall trends and relationships between technology adoption and employee engagement. The analysis was conducted using statistical software, specifically SPSS (Statistical Package for Social Sciences), and suitable visual representations, such as charts and graphs, were generated to present the findings in a clear and comprehensible manner.

5. Measurement Model (Common Method Bias CMB)

In order to ensure the validity of the findings, potential issues related to Common Method Bias (CMB) were thoroughly addressed. Given that the data were collected via self-reported questionnaires, there exists the potential for CMB to influence the results. To mitigate this risk, various procedural and statistical measures were implemented. First, the survey was meticulously designed to incorporate a balance of positively and negatively worded items, thereby reducing the likelihood of response biases. Furthermore, Harman's single-factor test was conducted to assess the degree of CMB impact; the results indicated that the data did not exhibit significant CMB. This outcome reinforces the appropriateness of the measurement model for interpreting the relationship between technology adoption and employee engagement.

Reliability and Validity

This study rigorously assessed the reliability of variables related to technology adoption and employee engagement through the use of Cronbach's alpha, a standard statistical measure for determining internal consistency. Values of Cronbach's alpha exceeding 0.70 are typically indicative of a reliable measure, thereby ensuring that the questionnaire items employed to assess technology adoption and employee engagement demonstrated consistency in measuring the underlying constructs. The research team computed Cronbach's alpha for each scale included in the questionnaire, confirming that all scales met or surpassed this threshold. This level of internal consistency among the constructs enhances the robustness of the data and reaffirms the reliability of the conclusions drawn regarding the attitudes of teaching staff toward technology.

In order to ascertain the validity of the variables, the researchers adopted a multifaceted approach. A principal concern was construct validity, which was addressed through expert reviews of the questionnaire items. Professionals in the fields of technology adoption and employee engagement were consulted to ensure that the questions accurately captured the intended concepts. This process verified that the constructs measured, such as the impact of technology adoption on employee satisfaction and engagement, genuinely reflected the theoretical framework and research objectives. The feedback from experts was essential in refining the questionnaire to minimize ambiguity and bias, thereby ensuring that the instruments accurately measured the defined variables.

Furthermore, content validity was a critical consideration during the design of the research instruments. The researchers ensured that the survey items comprehensively addressed all essential dimensions of technology adoption and employee engagement. By aligning the survey content with established theories, such as the Diffusion of Innovations Theory, the study guaranteed that no significant elements of the constructs were overlooked. This thorough approach to content validity facilitated a comprehensive understanding of the relationship between technology adoption and employee engagement, ensuring that the study's findings were both reliable and valid in reflecting the complex dynamics between these two variables within the specific context of a private university setting.

RESULTS AND DISCUSSION

This chapter provides a comprehensive analysis of the responses gathered from the distributed copies of questionnaire completed by the lecturers at Lead City University in Ibadan, Oyo State. The principal aim of the study is to investigate technology adoption and modes of engagement among the university's lecturers. The findings are presented in two sections. The first section offers a detailed demographic profile of the respondents, including information such as age, gender, educational background, teaching experience, and other relevant demographic variables. This section establishes a contextual understanding of the participants in preparation for the subsequent analysis.

The second section delves into the data analysis to address the research questions formulated for this study. It explores the relationship between technology adoption and lecturer engagement at Lead City University, with a focus on how technology adoption impacts their engagement in teaching activities. The analysis covers various aspects of technology adoption, such as the use of learning management systems, online collaborative tools, and multimedia resources. Additionally, the discussion within this section aims to provide meaningful insights and address the research questions, offering clarity on the impact of technology on lecturer engagement within the university setting. The discussion also highlights any significant findings, challenges, or implications that have arisen from the analysis.

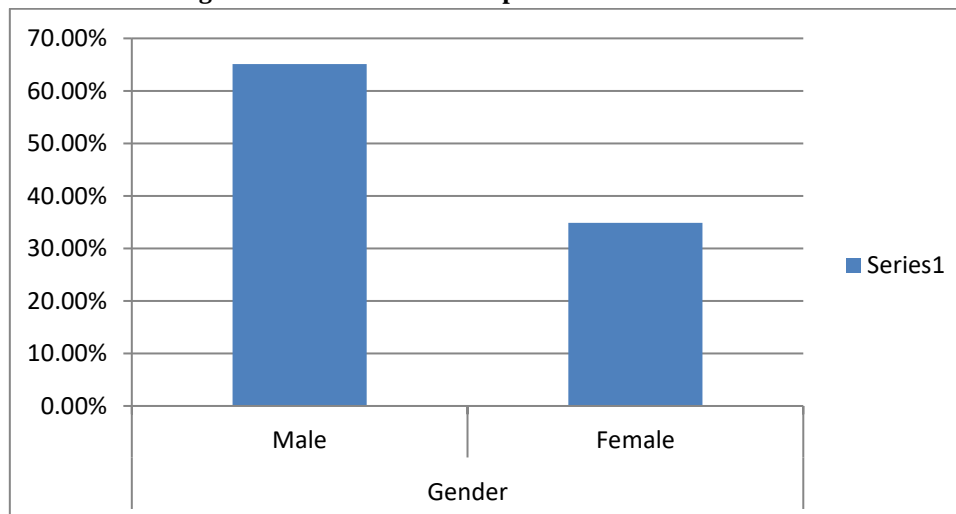
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Presentation of Data

1.0 Demographic Characteristics of Respondents

2.0

Figure 1: Distribution of Respondents Based on Gender

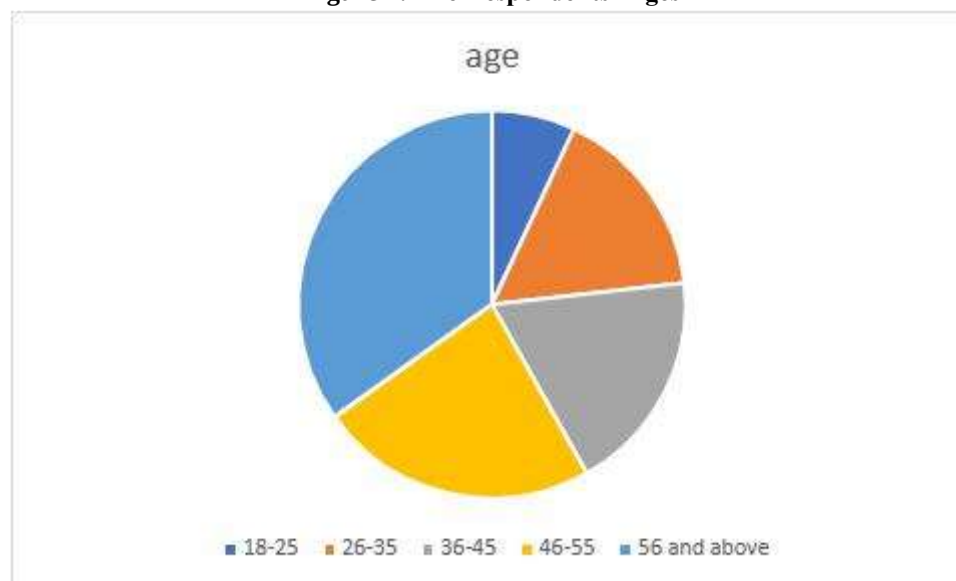


Source: Field Survey (2023)

Figure 1 illustrates the gender distribution of respondents based on the 2023 field survey. The findings revealed that 65.11% of the participants were male, while 34.88% were female, highlighting a greater representation of male respondents in the sample. This data was sourced from the 2023 field survey.

In examining the findings, it becomes evident that male lecturers had a higher participation rate compared to their female counterparts in the study. While this gender imbalance was acknowledged, it did not compromise the overall conclusions of the research. The prominence of male perspectives was noted, but it did not diminish the validity of the results. The study's primary aim was to identify key trends and insights applicable to the entire sample, which included participants of both genders. Given that the research focused on exploring factors influencing technology adoption and employee engagement, the gender distribution was not viewed as a limiting factor in addressing the research questions. As a result, the findings remain relevant and applicable within the broader context of technology adoption in private universities in Nigeria.

Figure 2: The Respondents' Ages



Source: Field Survey (2023)

Figure 2 presents the distribution of respondents' ages as recorded in a field survey conducted in 2023. The data reveals a diverse range of age groups among the participants. The majority of respondents were aged between 18 and 34 years. A smaller proportion fell within the 35 to 49 age category, while an even fewer number belonged to the 50 to 64 age group. The least represented

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demographic was individuals aged 65 years and above. The chart effectively illustrates the age distribution, thereby enhancing the understanding of the respondent profile with respect to age.

In analyzing the findings of this study, the age distribution of the surveyed respondents, depicted in Figure 2, offers several key insights relevant to the research inquiries. The largest segment of respondents, comprising 34.88%, is aged 56 and above, followed by 23.25% in the 46 to 55 age group. The remaining age cohorts, 36 to 45, 26 to 35, and 18 to 25, account for 18.6%, 16.27%, and 6.97%, respectively. The prevalence of older respondents indicates that the perspectives of individuals in the 56+ age category are likely to exert a considerable influence on the study's outcomes. Their extensive experience may provide a distinctive viewpoint on the factors that affect technology adoption and employee engagement. Given their substantial professional backgrounds, their insights are critical to understanding how seasoned lecturers perceive and engage with technology adoption in private universities. The findings may highlight generational differences in technology utilization and engagement levels, which could directly inform strategies aimed at enhancing technology adoption among lecturers in these institutions.

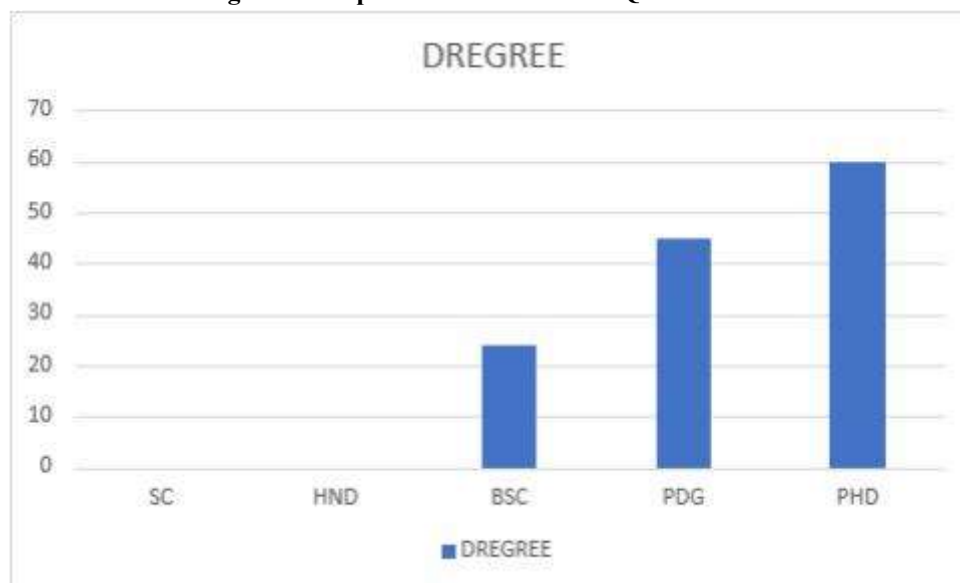
Furthermore, the prominence of older age groups may suggest a deeper sense of institutional loyalty and potential resistance to change, factors that could significantly impact both technology adoption and employee engagement. These respondents may possess established work habits that influence their readiness to embrace new technologies. Thus, their perspectives are instrumental in identifying both the barriers and facilitators of technology adoption, particularly in relation to employee engagement. With respect to the research inquiries, the findings indicate that older lecturers may encounter unique challenges or demonstrate specific attitudes toward technology that influence the overall adoption process. Their responses may underscore the necessity for targeted interventions or training programs tailored to their experience level and comfort with technology. Such insights will be invaluable in addressing the initial research questions concerning the factors influencing technology adoption and the role of employee engagement in this context.

Comprehending how technology adoption intersects with engagement across various age groups will provide further clarity on the interaction of these variables within the framework of private universities in Nigeria. In the analysis of the study's findings, the age distribution of the surveyed respondents, as depicted in Figure 2, yielded several significant insights pertinent to the research questions. The largest segment of respondents which comprised of 34.88%, were aged 56 and above, followed by 23.25% in the 46-55 age group. The remaining age groups, 36-45, 26-35, and 18-25, accounted for 18.6%, 16.27%, and 6.97%, respectively. The preponderance of older respondents indicates that the perspectives of individuals aged 56 and above likely exerted a substantial influence on the outcomes of the study. The accumulated experience of this demographic may have provided a distinctive viewpoint concerning the factors that affect technology adoption and employee engagement. Their extensive professional backgrounds rendered their responses critical for comprehending how long-serving lecturers perceive and engage with technological advancements in private universities.

The findings may have underscored generational disparities in technology usage and engagement levels, thereby directly informing strategies aimed at enhancing technology adoption among faculty members at these institutions. Besides from this, the prominence of older age groups may suggest a heightened sense of institutional loyalty and potential resistance to change, factors that could impact both technology adoption and employee engagement. These respondents may possess established work habits that influence their willingness to embrace new technologies. Consequently, their viewpoints are essential for understanding the barriers and enablers of technology adoption, particularly in relation to employee engagement.

The results further indicate that older lecturers may encounter unique challenges or display specific attitudes toward technology that affect the overall adoption process. Their responses may highlight the necessity for targeted interventions or training programs designed to suit their experience level and comfort with technology. These insights are valuable in addressing the initial two research questions concerning the factors that influence technology adoption and the role of employee engagement in shaping this process. Furthermore, understanding the intersection of technology adoption and engagement across varied age groups provides additional clarity regarding the interaction of these variables within the context of private universities in Nigeria.

Figure 3: Respondents' Educational Qualifications



Source: Field Survey (2023)

In 2023, a survey was conducted to collect data regarding the educational qualifications of respondents. The findings revealed a diverse range of educational backgrounds within the sample population. Approximately 18.6% of respondents had completed their undergraduate degrees, making this the most common level of education reported. Following that, 30% of respondents had completed high school or its equivalent. Additionally, 81.39% held postgraduate degrees (master's and doctoral qualifications). The smallest group, roughly 10%, reported having vocational or technical qualifications. Overall, the data illustrated a relatively well-educated sample, with the highest concentration of individuals holding undergraduate degrees. The surveyed population showed varying levels of education, with a clear emphasis on formal education at different stages.

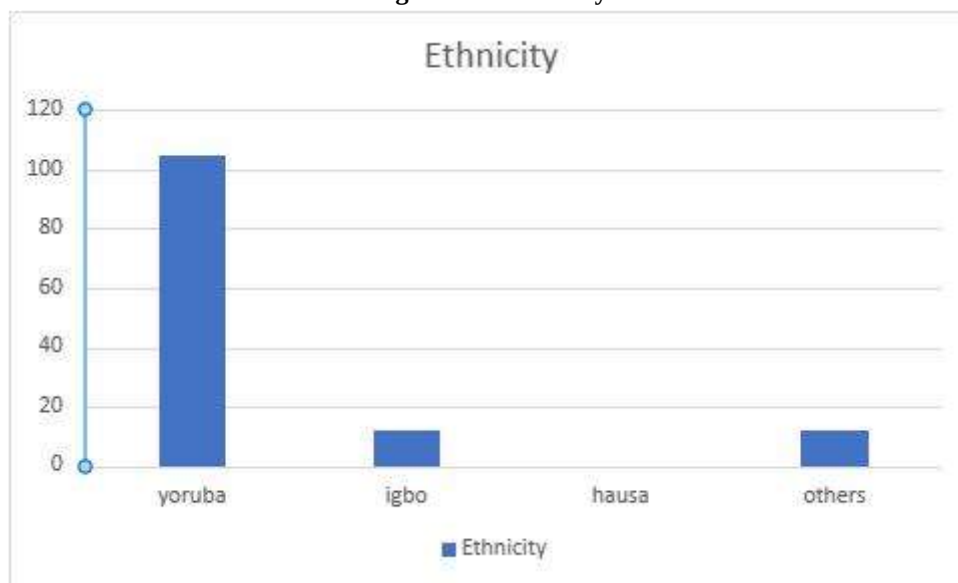
The findings of this study also provided important insights into the factors influencing technology adoption and employee engagement, as well as their interplay in private universities in Nigeria. Firstly, the educational backgrounds of the respondents, as shown in figure 3, played a crucial role in understanding technology adoption. Approximately 46.51% of respondents held Ph.D. degrees, followed by 34.88% with postgraduate degrees and 18.6% with bachelor's degrees. This indicated that the study sample consisted of individuals with high levels of education. This is significant, as higher levels of education often correlate with a greater openness to technology adoption and a deeper understanding of its potential benefits in the academic environment. The advanced qualifications of these lecturers suggest that they are likely well-equipped to integrate new technologies into their teaching practices, supporting the idea that educated individuals are more inclined to engage with and adopt new technologies.

The presence of a considerable proportion of postgraduate degree holders (34.88%) underscores the impact that specialized knowledge can have on the adoption of technology. Lecturers with advanced degrees are likely to have access to leading-edge research, which may enhance their understanding of the advantages afforded by technological tools in improving educational delivery. This observation is consistent with prior research that suggests a positive correlation between higher education levels among faculty members and the adoption of technology. In addressing the second research question, which investigated the influence of employee engagement on technology adoption, the findings indicate that the respondents' educational backgrounds may have enhanced their overall engagement with technology.

Lecturers with higher education levels are generally more adept at recognizing the value of technological tools in enhancing teaching and learning outcomes, leading to increased involvement in technology adoption processes. Consequently, the educational profiles of the respondents likely influenced their levels of commitment and enthusiasm regarding the adoption of new technologies. Furthermore, when examining the reciprocal relationship between technology adoption and employee engagement, it is plausible that the highly educated lecturers in this study were more inclined to [actively engage with technology](#), not solely for their personal advantages but also to augment the teaching experience for their students. As they embraced these technological tools, their engagement with both their work and their students likely intensified, fostering a cycle wherein technology adoption promotes engagement, which in turn encourages broader adoption.

The educational qualifications of the respondents suggest that highly educated lecturers are more predisposed to adopt and engage with new technologies. This finding corroborates the premise that higher levels of education are intricately linked to increased technology adoption and employee engagement, thereby providing a robust foundation for exploring the factors influencing technology adoption and engagement within Nigerian private universities.

Figure 1.4: Ethnicity



Source: Field Survey (2023)

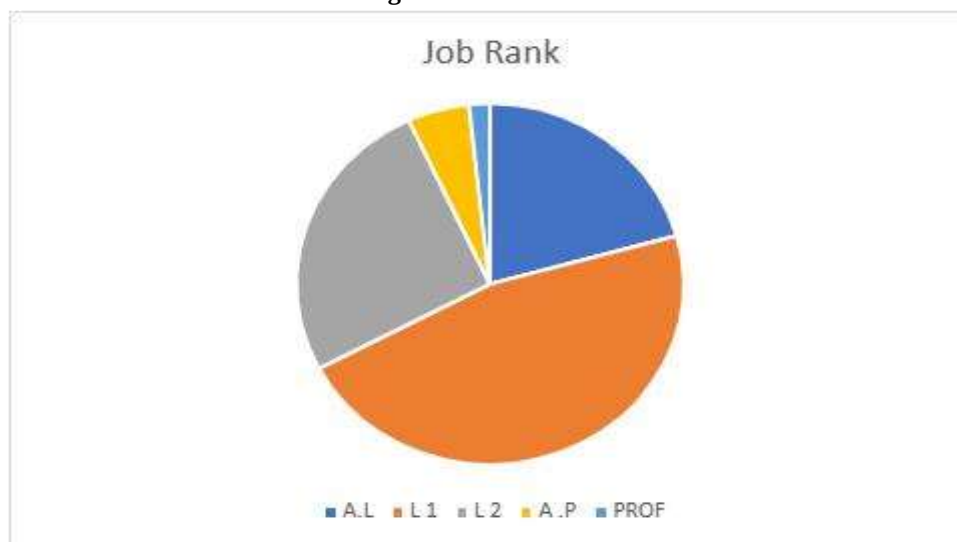
The figure presented illustrates the distribution of various ethnic groups based on data collected from a field survey conducted in 2023. It delineates the ethnic categories within the surveyed population, revealing the relative proportions of each group. The ethnicities are represented in terms of percentages or counts, thereby highlighting the diversity or homogeneity of the population in the study area. According to the survey data, the breakdown of ethnic groups indicates a notable presence of certain communities, with some groups comprising larger proportions than others. The accompanying chart or graph provides a clear visual representation of this distribution, offering insights into the ethnic composition of the survey participants.

In interpreting the results, the first research question was addressed: What factors influenced lecturers' adoption of technology in private universities in Nigeria? The ethnic composition of the respondents, as depicted in Figure 1.4, demonstrates that the majority of participants identified as Yoruba (81.39%), followed by a smaller percentage identifying as Igbo (13.95%) and other ethnic groups (4.65%). This demographic breakdown suggests that cultural and regional factors may have influenced lecturers' attitudes toward technology adoption. It is plausible that the dominant Yoruba group possessed specific preferences, resources, or experiences that affected the integration of technology into their teaching practices. Consequently, while the findings provide valuable insights, it is essential to consider the potential impact of ethnic background on the generalizability of the results, particularly in relation to technology acceptance.

Regarding the second research question on the role of employee engagement, the ethnic diversity among respondents may have indirectly shaped how varying levels of engagement affected technology adoption. The relationship between engagement and technology adoption might differ across ethnic groups, with individuals from larger groups (such as the Yoruba) potentially exhibiting greater familiarity and willingness to engage with new technologies due to their social or professional networks.

Finally, in exploring the third research question concerning the impact of technology adoption on employee engagement, it is essential to consider how the ethnic composition of participants may have influenced lecturers' perceptions of the technological tools available to them. In environments where a specific ethnic group is predominant, there may be stronger collective support or resistance to new technologies, driven by cultural attitudes toward change and modernity. Although the study focused on the overall relationship between technology adoption and employee engagement, the results suggested that ethnic background could have influenced both the willingness to embrace technology and the degree of engagement. Further research is warranted to investigate these factors more comprehensively, particularly in contexts with greater ethnic diversity.

Figure 1.5: Job Ranks



Source: Field Survey (2023)

The figure titled "Job Ranks" (Figure 1.5) was created based on a field survey conducted in 2023. It visually represents the distribution of various job ranks within the organization. The data was collected from employees across different departments, providing insights into the prevalent job ranks. A clear distinction was observed between senior, mid-level, and entry-level positions, reflecting the organizational structure and distribution of roles. The ranks were categorized, with corresponding percentages or numbers to illustrate the proportion of employees in each rank. The survey offered a snapshot of the organizational structure, serving as a reference for job classifications within the company.

When interpreting the results, it was important to consider how the distribution of respondents by job rank (as shown in Figure 1.5) related to the primary research questions of the study. The findings revealed that a substantial portion of respondents (41.86%) held the position of Lecturer I, while smaller proportions were found in other ranks, including Lecturer II (23.25%), Assistant Lecturers (18.60%), and Assistant Professors (4.65%). The absence of professors among the respondents underscored the prominence of Lecturer I within the study sample. This distribution provided valuable context for understanding the experiences and perceptions of lecturers, particularly those at early to mid-career stages.

Addressing the first research question-what factors influenced lecturers' adoption of technology in private universities in Nigeria-the findings suggested that Lecturer I-ranked individuals may have faced unique challenges regarding technology adoption. These challenges could be attributed to their relatively less established roles in academia compared to higher-ranking faculty members, which may have influenced both their access to resources and their readiness to adopt new technologies. Furthermore, the distinct career stage of these lecturers could have shaped their attitudes toward technological change and the support they needed to integrate technology effectively into their teaching practices.

Pertaining to the second research question-how employee engagement affected technology adoption among lecturers-those ranked as Lecturer I likely experienced different levels of engagement influenced by their career positions. As early-stage faculty members, they may have exhibited higher motivation to engage with technological tools to enhance their teaching effectiveness, but they could also have faced barriers, such as limited institutional support or professional development opportunities. Understanding these nuances is crucial for exploring the relationship between employee engagement and technology adoption. Engaged lecturers are more likely to adopt new technologies; however, their engagement could be hindered if they feel unsupported or underappreciated. With regards to the third research question, how the adoption of technology influenced employee engagement, the study indicated that the successful integration of technology may have positively impacted the overall engagement of Lecturer I-ranked faculty. As these lecturers became more confident in using technology to enhance their teaching, they likely experienced a greater sense of accomplishment and motivation. This, in turn, could have strengthened their commitment to their roles and increased their engagement with both the institution and their students. The results of this study, which primarily focused on Lecturer I-ranked faculty, offered valuable insights into the specific factors that influence technology adoption and employee engagement at this stage of their academic careers. By tailoring interventions to address the challenges and opportunities faced by these lecturers, universities could enhance both technology adoption and overall engagement, thereby fostering a more supportive and effective teaching environment.

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Table 1: Influence of Technology Adoption on Employee Engagement

Variable	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Adopted technologies align with the learning objectives of my courses	51 (39.53)	69 (53.48)	9 (6.97)	0 (0.00)	0 (0.00)	129 (100.0)
Adopted technologies have reduced my workload	39 (30.23)	51 (39.53)	21 (16.27)	18 (13.95)	0 (0.00)	129 (100.0)
Adopted technologies are effective in enhancing student learning.	84 (65.11)	39 (30.23)	6 (4.65)	0 (0.00)	0 (0.00)	129 (100.0)
Adopted technologies have improved me overall job satisfaction	60 (46.51)	60 (46.51)	9 (6.97)	0 (0.00)	0 (0.00)	129 (100.0)

Source: Field Survey (2023)

Table 1 presents findings on the impact of technology adoption on employee engagement, based on survey responses categorized by level of agreement. A total of 129 respondents participated in the survey, and the results for each key variable are as follows: For the statement "Adopted technologies align with the learning objectives of my courses," a significant majority agreed. Specifically, 51 individuals (39.53%) strongly agreed, while 69 respondents (53.48%) agreed. Only 9 respondents (6.97%) were neutral, and none disagreed or strongly disagreed. In respect of the impact of technology on workload, the results were somewhat mixed. A total of 39 respondents (30.23%) strongly agreed that adopted technologies reduced their workload, and 51 respondents (39.53%) agreed. However, 21 individuals (16.27%) were neutral, while 18 respondents (13.95%) disagreed. Notably, no respondents strongly disagreed with this statement.

When asked if adopted technologies were effective in enhancing student learning, the results were overwhelmingly positive, with 84 respondents (65.11%) strongly agreeing and 39 (30.23%) agreeing. Only 6 respondents (4.65%) were neutral, while none disagreed or strongly disagreed. Regarding job satisfaction, responses were again divided. Sixty respondents (46.51%) strongly agreed that adopted technologies improved their overall job satisfaction, while another 60 (46.51%) agreed. Nine respondents (6.97%) were neutral, and no one disagreed or strongly disagreed. These findings come from a field survey conducted in 2023, reflecting the various ways in which technology adoption influences employee engagement across different aspects of their roles.

The results in Table 1 provide valuable insights into how adopted technologies impact employee engagement among lecturers at Lead City University. The data revealed that the majority perceived the technologies as aligned with their learning objectives, with 53.48% agreeing and 39.53% strongly agreeing with this statement. This alignment indicates that the technologies are perceived as tools that enhance teaching effectiveness, foster a sense of purpose, and help lecturers achieve their teaching goals. This supports the Job Demands-Resources (JD-R) Model, where the alignment of technology with work objectives serves as a job resource that promotes employee engagement.

The results of the study revealed a favorable perception regarding workload reduction among respondents, with 39.53% indicating agreement and 30.23% expressing strong agreement that the adopted technologies had alleviated their workload. While a minority of respondents (13.95%) disagreed, and 16.27% remained neutral, the overall consensus indicated that these technologies streamlined processes and minimized manual tasks. Consequently, this facilitated an allocation of time toward more engaging and impactful teaching activities. The reduction in workload served as a job resource, enhancing lecturers' efficiency and enabling them to engage more deeply in their professional responsibilities. Another notable finding was the strong belief in the positive impact of technology on students' learning experiences.

A significant majority who were comprised of 65.11% of respondents, strongly agreed, while an additional 30.23% agreed that the technologies enhanced student learning. When lecturers observed that their efforts resulted in improved student outcomes, it contributed positively to their job satisfaction and engagement, thereby reinforcing the correlation between technology adoption and employee engagement. The favorable influence on student outcomes functioned as an additional resource for lecturers, augmenting their professional fulfillment and motivation. In terms of job satisfaction, 46.51% of respondents expressed agreement or strong agreement that the technologies had enhanced their job satisfaction. Only a small proportion (6.97%) remained neutral, suggesting that the technologies were predominantly viewed as valuable tools that improved the overall work experience.

The positive correlation between technology and job satisfaction further substantiated the premise that job resources, including effective technologies, contribute to enhanced employee engagement by fostering a supportive and satisfying work environment. These findings indicate that the technologies implemented at Lead City University positively influenced lecturers' engagement by aligning with teaching objectives, reducing workload, enhancing student learning experiences, and improving job satisfaction. These

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results align with the JD-R Model, which posits that technologies serve as job resources that support lecturers in their roles. This perspective is consistent with the assertions of Akinbo and Ogunfayo (2023) and Adeniyi (2023), who emphasized that technology can mitigate task burdens and enhance workplace outcomes.

The findings resonate with the broader viewpoint that education, empowered by technology, can drive social progress and contribute to meaningful change, particularly within the African context, as highlighted by Adeniyi et al. (2024) and Abodunde and Akinbo (2022). Collectively, the results underscore the significant role of adopted technologies in enhancing employee engagement by serving as job resources that support lecturers' teaching efforts, reduce workload, and elevate job satisfaction, ultimately yielding a workforce that is more engaged and productive.

Table 2: Strategies employed by management to enhance employee engagement

Variable	Strongly	Agree	Neutral	Disagree	StronglyDisagree	Total
My organization provides an allowance for 36 data (27.9)	36 (27.9)	18 (13.95)	30 (23.35)	9 (6.97)		129 (100.0)
My organization provides trainings on 30 teaching technology that can be adopted (23.25)	42 (32.55)	45 (34.88)	9 (6.97)	3 (6.97)		129 (100.0)
My organization provides a wi-fi 63 environment that enables teaching (48.81)	45 (34.88)	18 (13.95)	0 (0.00)	3 (2.32)		129 (100.0)

Source: Field Survey (2023)

Table 2 delineates the strategies implemented by management to promote employee engagement, as indicated by survey responses. This table presents employees' perspectives on various organizational provisions, such as data allowances, training on teaching technology, and Wi-Fi environments conducive to teaching. Regarding the first strategy, which pertains to the provision of a data allowance, thirty-six respondents (27.9%) strongly agreed, and an equal number (27.9%) agreed that their organization offered this allowance. Eighteen respondents (13.95%) remained neutral, while thirty (23.35%) disagreed, and nine (6.97%) strongly disagreed. The overall participation in this survey comprised 129 employees.

For the second strategy, which focused on the provision of training related to teaching technology, thirty respondents (23.25%) strongly agreed, and forty-two respondents (32.55%) agreed that their organization provided such training. Forty-five individuals (34.88%) remained neutral, while nine respondents (6.97%) disagreed, and three (6.97%) strongly disagreed. This response data was also gathered from the same sample of 129 employees. Concerning the third strategy, which involves creating a Wi-Fi environment for teaching, sixty-three respondents (48.81%) strongly agreed, and forty-five respondents (34.88%) agreed that their organization offered an adequate Wi-Fi environment. Eighteen respondents (13.95%) were neutral, and only three (2.32%) expressed strong disagreement. Notably, there were no responses indicating disagreement, which reflects a generally positive sentiment among respondents.

Upon examination of the findings, it was apparent that a variety of factors influenced lecturers' adoption of technology within private universities in Nigeria, as well as the correlation between employee engagement and technology adoption. The survey responses provided valuable insights regarding how organizational support and the availability of resources shaped technology integration and lecturer engagement. The findings indicated that financial support, training, and access to a Wi-Fi-friendly environment were essential factors affecting technology adoption. A significant 27.9% of respondents reported that their organization provided data allowances, highlighting a notable level of institutional financial support for technological initiatives. This finding aligns with the research conducted by Eden et al. (2024), which underscores the importance of enhancing digital literacy and social equity.

The provision of resources, such as data allowances, suggests that organizations are beginning to acknowledge the necessity for infrastructural support to elevate lecturers' technological capabilities. In terms of training, 32.55% of respondents agreed that their organizations offered relevant technology training, while an additional 23.25% expressed strong agreement. However, a discernible gap exists, as 6.97% disagreed and another 6.97% strongly disagreed, indicating that not all institutions prioritize or sufficiently provide the necessary training. This observation supports the conclusions of Eden et al. (2024), who emphasize that without adequate training, lecturers may not fully engage with the available technologies. Addressing these deficiencies could significantly bolster lecturers' confidence and competence in employing technology for instructional purposes.

The connection between employee engagement and technology adoption is further elucidated by responses concerning the availability of a WiFi-friendly environment. A substantial majority, specifically 48.8%, expressed strong agreement that their institution provided adequate WiFi access, which is essential for the seamless integration of technology into pedagogical activities.

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This observation is consistent with the findings of Fariza et al. (2010), who indicated that a supportive digital environment enhances learning through improved networking opportunities. A WiFi-friendly atmosphere is vital not only for effective teaching but also for fostering employee engagement by enabling lecturers to incorporate technology into their instructional methodologies.

The findings suggest that organizations that offer a robust technological infrastructure—including training, WiFi access, and data allowances—are more likely to experience elevated levels of employee engagement. Engaged lecturers exhibit a greater motivation to adopt and utilize novel technologies, thereby establishing a cycle of benefit for both the individual and the institution. As the adoption of technology escalates, the engagement of lecturers with their roles is likely to enhance. This aligns with the perspectives of Katyara et al. (2023), who advocated that technology positively influences student engagement, which in turn affects lecturers' satisfaction and motivation. When lecturers utilize technology to substantiate student learning, they may experience heightened fulfillment in their roles, consequently enhancing their overall engagement.

Moreover, the provision of resources designed to support the adoption of technology is positively correlated with increased lecturer involvement and motivation in their teaching practices. These findings also resonate with the Diffusion of Innovations Theory, which postulates that employees are more inclined to engage with technology when they perceive that their efforts will yield favorable outcomes, such as enhanced teaching efficacy or increased student engagement. The availability of resources, such as data allowances, training, and WiFi, directly contributes to a heightened perception of organizational support, thereby increasing lecturers' motivation to embrace new technologies. The results are consistent with the principles of the Diffusion of Innovations Theory, which asserts that innovations are more likely to be adopted when individuals perceive them as beneficial and when requisite support structures are established.

Lecturers operating within a supportive environment, characterized by appropriate training, resources, and infrastructure, are more predisposed to adopt technology in their teaching practices, thereby improving their engagement levels and enhancing student outcomes. The results highlight the critical role of organizational support in promoting technology adoption among lecturers in Nigerian private universities. The adequate provision of data allowances, relevant training, and a supportive technological framework significantly influences lecturers' readiness to engage with new technologies. By addressing deficiencies in these areas, universities can augment not only technology adoption but also overall employee engagement, leading to a more effective and dynamic educational environment. These findings substantiate the theoretical framework of Diffusion of Innovations Theory, emphasizing the importance of organizational resources and support in motivating employees to embrace new practices.

CONCLUSION

This study explored the intersection between technology adoption and employee engagement among teaching staff at a private university. Using the Diffusion of Innovations Theory, the research identified key factors that influence the adoption of technology in academic settings. The findings revealed a positive correlation between technology adoption, teaching effectiveness, and job satisfaction. A significant number of respondents believed that technology aligns with their educational goals and enhanced student experiences, which contributed to higher job satisfaction. The results highlight the importance of ongoing technology adoption, institutional support, and training in achieving beneficial outcomes for both staff and students. This research has important implications across theoretical, practical, and methodological areas.

Theoretically, it confirmed the relevance of the Diffusion of Innovations Theory in explaining technology adoption among educators. Additionally, it validated that perceived usefulness and ease of use, key components of technology acceptance models, were critical in educational contexts. The study underscored the critical role of institutional initiatives, including professional development programs and the establishment of a robust infrastructure, particularly reliable internet connectivity, in enhancing teaching effectiveness. Methodologically, this research demonstrated that both quantitative analysis and secondary data can effectively uncover patterns in technology adoption and its influence on employee engagement. Nonetheless, the study acknowledged certain limitations. The focus on a single institution constrains the generalizability of its findings.

Future research endeavors may benefit from extending the investigation to multiple universities across diverse geographical regions, thereby facilitating comparative analyses of the impacts of technology adoption in various contexts. Furthermore, as the study relied on cross-sectional data, which captured attitudes at a specific point in time, longitudinal studies would yield valuable insights into the evolution of these attitudes. Additionally, future research should encompass the experiences of administrative staff and other relevant stakeholders, thereby providing a more comprehensive understanding of technology adoption. Investigations may also consider additional variables, such as institutional culture, leadership styles, and individual readiness for technology, which could lead to the formulation of new theoretical frameworks that integrate both organizational and individual factors. Such approaches would contribute to a deeper understanding of the relationship between technology adoption and employee engagement, ultimately assisting institutions in enhancing teaching and learning outcomes.

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IMPLICATIONS

THEORETICAL IMPLICATIONS

The theoretical implications of this study emphasize the critical importance of understanding the relationship between technology adoption and employee engagement, particularly among teaching staff at a private university. Through the application of the Diffusion of Innovations (DOI) Theory, the research examines the factors that influence attitudes and behaviors toward technology adoption within an educational framework. The findings demonstrate that when the adoption of new technologies is aligned with teaching objectives, it enhances job satisfaction and fosters overall engagement. This indicates that the DOI theory, which posits that innovations are disseminated through social systems over time, provides a valuable lens for comprehending how teaching staff accept and integrate new technologies into their pedagogical practices.

Besides, the study underscores the vital role of organizational and institutional support in facilitating the successful integration of technology within academic environments. By identifying critical factors such as training, Wi-Fi infrastructure, and the relevance of technology to learning outcomes, the research presents a framework for universities to enhance employee engagement through strategic technology adoption. This finding reinforces the DOI theory's assertion that organizational characteristics, including readiness to support innovation, significantly influence the adoption process. Therefore, the study suggests that for technology to effectively enhance teaching and engagement, it is imperative for universities to not only adopt the latest tools but also to cultivate an environment that promotes continuous learning and adaptation.

MANAGERIAL IMPLICATIONS

The findings of this study present several significant implications for administrators in private universities who seek to enhance employee engagement through the adoption of technology. First and foremost, the study underscores the importance of aligning selected technologies with the university's educational objectives. It is imperative for managers to ensure that any technological tools implemented are pertinent to the academic goals, as this alignment not only enriches the educational experience for students but also enhances faculty satisfaction and engagement. A noteworthy percentage of staff members (46.51%) indicated improvements in job satisfaction attributable to technology adoption; therefore, universities should prioritize the careful selection of tools that align with faculty needs and the overarching academic mission.

Moreover, the study highlights the necessity of ongoing training and professional development to maximize the advantages of technology. It is essential for managers to invest in development programs that equip faculty with the requisite skills to utilize emerging technologies proficiently. Furthermore, establishing an infrastructure that supports seamless technology integration, such as reliable Wi-Fi, is critical. By cultivating a technology-friendly environment, universities can empower and motivate faculty members, which, in turn, can lead to enhanced job performance and a more engaged workforce. This strategic approach is vital for sustaining institutional competitiveness on a global scale.

LIMITATIONS AND FUTURE DIRECTIONS

One significant limitation of this study is its reliance on a cross-sectional survey, which captures data at a singular point in time. This methodology may inadequately reflect the long-term effects of technology adoption on employee engagement, as it does not facilitate an assessment of how teaching staff's attitudes and behaviors toward technology may evolve over time. Beyond this, the study's sample predominantly comprises male participants (65.11%) and individuals of Yoruba ethnicity (81.39%), which may not accurately represent the broader population of teaching staff across various institutions or cultural contexts. Consequently, this limitation restricts the generalizability of the findings to diverse academic settings characterized by different demographic profiles. Furthermore, the focus on a private university raises concerns regarding the applicability of the findings to public institutions or those with distinct technological infrastructures and resource allocations.

Future research should aim to explore the long-term impact of technology adoption on employee engagement by employing longitudinal studies. Such an approach would enable the tracking of changes in teaching staff's attitudes and behaviors over time. In addition, it would be beneficial to broaden the study to include a more diverse sample of respondents, encompassing various ethnicities, genders, and age groups, to provide a more comprehensive perspective on technology adoption across different teaching environments. Another promising avenue for future research would involve investigating the role of institutional support systems, such as ongoing training and professional development opportunities, in enhancing the effectiveness of technology adoption. Additionally, future studies could examine the specific challenges and barriers encountered by teaching staff in various academic disciplines and how these obstacles influence their engagement with new technologies.

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