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Impact of ICT on Entrepreneurial Skills, Values, and Pre-Service Teachers in Colleges Of Education in Kaduna State

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ABSTRACT

This study investigated the impact of Information and Communication Technology (ICT) on the entrepreneurial skills, values, and development of pre-service teachers in Colleges of Education in Kaduna State. The main objectives of the study were to examine the influence of ICT on pre-service teachers' entrepreneurial skills and to assess the effect of ICT on entrepreneurial values among pre-service teachers. The study tested one hypotheses ICT has a significant impact on the entrepreneurial skills of pre-service teachers, and A descriptive survey research design was adopted for the study. The population consisted of 1,068 pre-service teachers from selected Colleges of Education in Kaduna State. Using Taro Yamane's formula, a representative sample of 291 pre-service teachers was drawn employing a multi-stage sampling technique, combining purposive, stratified, and simple random sampling. Data were collected using a structured questionnaire and analyzed using descriptive statistics and inferential statistics (t-test and regression analysis) to test the hypotheses at a 0.05 significance level. The findings revealed that ICT has a significant positive impact on the entrepreneurial skills of pre-service teachers, including creativity, problem-solving, opportunity recognition, and innovation. Furthermore, ICT was found to significantly enhance entrepreneurial values, such as self-reliance, adaptability, and risk-taking among pre-service teachers. The study concluded that ICT integration is critical in enhancing both the skills and values necessary for entrepreneurial development in teacher education. Based on the findings, it was recommended that Colleges of Education should strengthen ICT infrastructure, provide continuous ICT training for pre-service teachers, and integrate ICT-based entrepreneurship education into the curriculum to enhance entrepreneurial competencies and values among future teachers.

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INTRODUCTION

The rapid advancement of Information and Communication Technology (ICT) has significantly transformed various sectors of the global economy, including education. In the 21st century, ICT is no longer viewed as an optional tool but as a critical driver of innovation, knowledge dissemination, and skills acquisition. In the context of teacher education, ICT plays a pivotal role in equipping pre-service teachers with competencies necessary for effective teaching and entrepreneurial development (UNESCO, 2021). The integration of ICT into education enhances teaching methodologies, fosters creativity, and supports the development of problem-solving and critical thinking skills among learners.

Entrepreneurship education has gained increasing attention as a strategic approach to addressing unemployment and promoting self-

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reliance, particularly in developing countries like Nigeria. The incorporation of ICT into entrepreneurship education has been identified as a catalyst for improving entrepreneurial skills such as innovation, opportunity recognition, digital marketing, and business management (Adeosun & Shittu, 2022). ICT tools such as computers, mobile devices, internet platforms, and digital applications enable learners to acquire practical and market-relevant skills that are essential in today's digital economy.

Pre-service teachers in Colleges of Education represent a vital segment of the educational system, as they are being trained to become future educators. Their exposure to ICT not only enhances their teaching capabilities but also equips them with entrepreneurial competencies that can be transferred to their students. According to Yusuf and Balogun (2023), ICT integration in teacher education improves instructional delivery and prepares pre-service teachers to adapt to modern educational demands, including the promotion of entrepreneurial thinking among learners. These dual role positions pre-service teachers as both knowledge transmitters and facilitators of innovation and enterprise development.

In Nigeria, particularly in Kaduna State, the adoption of ICT in Colleges of Education has witnessed gradual improvement due to government policies and institutional initiatives. The National Policy on Education emphasizes the integration of ICT at all levels of education as a means of enhancing quality and relevance (Federal Republic of Nigeria, 2021). Despite these efforts, challenges such as inadequate infrastructure, limited access to digital tools, poor electricity supply, and insufficient ICT competencies among educators continue to hinder effective implementation (Abubakar & Lawal, 2020; Musa et al., 2024).

Furthermore, ICT contributes significantly to the development of entrepreneurial values such as creativity, innovation, risk-taking, independence, and adaptability. These values are essential for preparing individuals to thrive in a competitive and technology-driven economy. Studies have shown that learners exposed to ICT-based learning environments tend to develop higher levels of self-efficacy and entrepreneurial orientation compared to those in traditional learning settings (Okeke & Eze, 2022). This underscores the importance of integrating ICT into teacher education programmes to foster both skills and values necessary for entrepreneurship.
However, despite the recognized benefits of ICT, there remains a gap in understanding its specific impact on entrepreneurial skills and values among pre-service teachers in Colleges of Education, particularly within Kaduna State.

Most existing studies have focused on general ICT usage or entrepreneurship education independently, with limited emphasis on their intersection in teacher training institutions. This gap necessitates a focused investigation into how ICT influences the development of entrepreneurial competencies and values among pre-service teachers. Therefore, this study seeks to examine the impact of ICT on entrepreneurial skills, values, and pre-service teachers in Colleges of Education in Kaduna State. By doing so, it aims to provide empirical evidence that will inform policy formulation, curriculum development, and instructional practices, ultimately contributing to the production of innovative, self-reliant, and digitally competent educators.

Despite the growing recognition of Information and Communication Technology (ICT) as a critical tool for enhancing teaching, learning, and entrepreneurial development, its effective integration into teacher education programmes in Nigeria remains a significant challenge. In Colleges of Education, particularly in Kaduna State, ICT facilities are often inadequate, poorly maintained, or underutilized, thereby limiting the opportunities for pre-service teachers to acquire relevant digital and entrepreneurial competencies (Abubakar & Lawal, 2020; Musa et al., 2024).

Entrepreneurship education is designed to equip learners with practical skills and values such as creativity, innovation, risk-taking, and self-reliance. However, evidence suggests that many pre-service teachers graduate without possessing sufficient entrepreneurial skills needed to function effectively in a technology-driven economy (Adeosun & Shittu, 2022). This situation raises

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concerns about their preparedness not only to teach entrepreneurship but also to integrate ICT tools in fostering entrepreneurial mindsets among their future students.

Furthermore, while ICT has the potential to enhance entrepreneurial learning through access to digital resources, online business platforms, and innovative teaching methods, its impact on entrepreneurial skills and values among pre-service teachers has not been adequately explored. Most studies have focused either on ICT in education or entrepreneurship education independently, with limited attention to how ICT specifically influences entrepreneurial competencies in teacher training institutions (Okeke & Eze, 2022; Yusuf & Balogun, 2023).

In addition, challenges such as low digital literacy among some educators, inconsistent electricity supply, and lack of institutional support further hinder the effective use of ICT in Colleges of Education. These limitations reduce the capacity of pre-service teachers to develop both the skills and values required for entrepreneurship in the modern economy (Federal Republic of Nigeria, 2021). Therefore, the problem of this study lies in the inadequate understanding and utilization of ICT in developing entrepreneurial skills and values among pre-service teachers in Colleges of Education in Kaduna State. This study seeks to bridge this gap by examining the extent to which ICT influences entrepreneurial competencies and values among these future educators.

Objectives of the Study

The main objective of this study is to examine the impact of ICT on entrepreneurial skills and values among pre-service teachers in Colleges of Education in Kaduna State. The specific objective is to examine the impact of ICT on the development of entrepreneurial skills among pre-service teachers in Colleges of Education in Kaduna State.

Research Hypotheses

The following null hypotheses was tested at 0.05 level of significance:

H_{01}: ICT has no significant impact on the development of entrepreneurial skills among pre-service teachers in Colleges of Education in Kaduna State.

Concept of Information and Communication Technology (ICT)

Information and Communication Technology (ICT) refers to a broad range of technological tools and resources used to create, store, process, and communicate information. These technologies include computers, mobile devices, internet services, software applications, and digital communication platforms that facilitate access to information and support learning processes (UNESCO, 2021).

In the context of education, ICT is viewed as a transformative tool that enhances teaching and learning by promoting interactive, learner-centered approaches. ICT enables access to a wide range of educational resources, supports collaboration, and improves the quality of instruction through multimedia and digital content (Kumar & Nanda, 2020). It also provides opportunities for distance learning, online collaboration, and the use of virtual learning environments, which are essential in modern education systems.

Recent studies have emphasized the role of ICT in developing digital competencies among learners and educators. According to Yusuf and Balogun (2023), ICT integration in teacher education equips pre-service teachers with essential digital skills required for effective classroom instruction and professional development. These skills include the ability to use educational software, online teaching platforms, and digital tools for assessment and communication.

Furthermore, ICT plays a crucial role in fostering innovation and creativity, which are key components of entrepreneurship. Through ICT, learners can access global markets, engage in digital entrepreneurship, and develop skills such as online marketing, content creation, and e-commerce management (Adeosun & Shittu, 2022). This makes ICT a vital component of entrepreneurship education, particularly in

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preparing individuals for participation in the digital economy.

In Nigeria, the integration of ICT into the education system has been supported by national policies aimed at improving the quality and relevance of education. The Federal Republic of Nigeria (2021) emphasizes the need for ICT integration at all levels of education to enhance teaching effectiveness and promote technological advancement. However, the implementation of ICT in educational institutions, including Colleges of Education, is still faced with challenges such as inadequate infrastructure, limited access to digital tools, and insufficient technical expertise (Musa et al., 2024).

Additionally, ICT has been recognized as a driver of economic growth and development, particularly in developing countries. It enables individuals to acquire relevant skills, improve productivity, and create employment opportunities. Okeke and Eze (2022) note that ICT exposure significantly influences learners' entrepreneurial orientation by enhancing their ability to identify business opportunities and adapt to changing market conditions.

Concept of Entrepreneurship Education

Entrepreneurship education refers to the process of equipping individuals with the knowledge, skills, attitudes, and values necessary to identify business opportunities, create ventures, and manage enterprises effectively. It is designed to foster innovation, creativity, and self-reliance, particularly among youths and students in formal educational institutions (Adeosun & Shittu, 2022). In recent years, entrepreneurship education has become a central component of educational reforms globally, especially in developing countries where unemployment rates are high. In Nigeria, entrepreneurship education was introduced into the curriculum of tertiary institutions as a strategic response to graduate unemployment and economic challenges. The aim is to produce graduates who are job creators rather than job seekers (Federal Republic of Nigeria, 2021).

Entrepreneurship education goes beyond theoretical knowledge; it emphasizes practical learning experiences such as business simulations, project-based learning, and exposure to real-life entrepreneurial activities. According to Nwosu and Chukwudi (2021), effective entrepreneurship education integrates both cognitive and experiential learning approaches, enabling learners to develop critical thinking, problem-solving, and decision-making skills.

The integration of Information and Communication Technology (ICT) into entrepreneurship education has further enhanced its effectiveness. ICT provides access to digital tools, online resources, and global markets, thereby enabling learners to acquire modern entrepreneurial competencies such as digital marketing, e-commerce, and innovation management (Okeke & Eze, 2022). Through ICT, students can explore business ideas, conduct market research, and engage in online entrepreneurial activities, making learning more practical and relevant. For pre-service teachers, entrepreneurship education is particularly important as it prepares them not only to be self-reliant but also to teach and promote entrepreneurial thinking among their future students. Yusuf and Balogun (2023) assert that teacher education programmes that incorporate entrepreneurship education and ICT help produce educators who can integrate innovative teaching strategies and foster entrepreneurial mindsets in the classroom.

However, despite its importance, the implementation of entrepreneurship education in Nigerian Colleges of Education faces several challenges, including inadequate funding, lack of qualified instructors, insufficient practical exposure, and poor integration of ICT (Musa et al., 2024). These challenges limit the effectiveness of entrepreneurship education in achieving its intended objectives.

Concept of Entrepreneurial Skills

Entrepreneurial skills refer to the abilities and competencies required to identify opportunities, create, and successfully manage business ventures. These skills are essential for innovation, business growth, and economic development. Entrepreneurial skills encompass a

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wide range of competencies, including creativity, critical thinking, problem-solving, risk-taking, communication, leadership, and financial management (Okeke & Eze, 2022).

In the context of education, entrepreneurial skills are developed through structured learning experiences that encourage active participation, innovation, and practical application of knowledge. According to Adeosun and Shittu (2022), entrepreneurial skills enable individuals to transform ideas into viable business opportunities and adapt to changing economic environments.

One of the key components of entrepreneurial skills is creativity, which involves generating new ideas and solutions to problems. Creativity is closely linked with innovation, which is the ability to implement new ideas in practical ways. ICT plays a significant role in enhancing creativity and innovation by providing access to digital tools and platforms that support idea generation and collaboration (Kumar & Nanda, 2020).

Another important entrepreneurial skill is opportunity recognition, which involves identifying and evaluating business opportunities in the environment. ICT facilitates this process by providing access to market information, trends, and data analytics that help individuals make informed decisions (Nwosu & Chukwudi, 2021). Additionally, ICT supports the development of digital skills such as online marketing, e-commerce, and content creation, which are increasingly important in modern entrepreneurship. Risk-taking and decision-making are also critical entrepreneurial skills. These skills enable individuals to make informed choices in uncertain situations and manage business risks effectively. Exposure to ICT-based learning environments has been shown to improve learners' confidence and willingness to take calculated risks (Yusuf & Balogun, 2023).

Furthermore, communication and networking skills are essential for entrepreneurial success. ICT tools such as social media, email, and online collaboration platforms enable individuals to communicate effectively, build professional networks, and access global markets. These tools enhance the ability of pre-service teachers to interact, share ideas, and collaborate on entrepreneurial projects.

Despite the importance of entrepreneurial skills, many pre-service teachers in Nigerian Colleges of Education lack adequate exposure to practical training and ICT tools necessary for skill development. This gap limits their ability to acquire and apply entrepreneurial competencies effectively (Musa et al., 2024).

In conclusion, entrepreneurial skills are essential for personal and economic development. The integration of ICT into teacher education programmes provides opportunities for enhancing these skills, thereby preparing pre-service teachers to become innovative educators and potential entrepreneurs.

ICT Integration in Colleges of Education in Nigeria

The integration of Information and Communication Technology (ICT) in Colleges of Education in Nigeria has become a critical component of educational reform aimed at improving teaching quality, enhancing learning outcomes, and equipping pre-service teachers with 21st-century competencies. ICT integration involves the incorporation of digital tools such as computers, internet services, multimedia technologies, and e-learning platforms into teaching, learning, and administrative processes (Usman et al., 2024).

In Nigerian Colleges of Education, ICT integration is increasingly recognized as essential for preparing pre-service teachers to function effectively in modern classrooms. The use of ICT facilitates interactive teaching methods, promotes student-centered learning, and enhances access to a wide range of educational resources. According to Usman et al. (2024), technology integration in teacher education transforms learning environments by improving student engagement, supporting innovative pedagogical practices, and fostering the development of digital and entrepreneurial skills.

Furthermore, ICT integration supports the development of professional competencies among pre-service teachers. It enables them to

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acquire digital literacy skills, utilize instructional technologies, and adapt to emerging trends such as online learning and virtual classrooms. This is particularly important in the post-pandemic era, where digital learning has become a central aspect of education globally (Theodorio et al., 2024). ICT also enhances collaboration, communication, and access to global knowledge networks, thereby broadening the learning experience of pre-service teachers.

Despite these benefits, the level of ICT integration in Nigerian Colleges of Education remains relatively low and uneven across institutions. Several studies have identified key challenges hindering effective ICT implementation. One major challenge is inadequate infrastructure, including limited access to computers, unreliable internet connectivity, and poor electricity supply, which restrict the use of ICT tools in teaching and learning processes .
Disciplines In Nigeria

Another significant challenge is the lack of adequate ICT skills and training among teacher educators. Many instructors are not sufficiently trained to integrate technology into their teaching practices, resulting in underutilization of available ICT resources . This limitation affects the quality of instruction and reduces the effectiveness of ICT in enhancing learning outcomes.

Concept of Entrepreneurial Values

Entrepreneurial values refer to the beliefs, attitudes, and behavioral orientations that guide individuals toward entrepreneurial activities and success. These values shape how individuals perceive opportunities, make decisions, and respond to challenges in the process of creating and managing ventures. Entrepreneurial values are considered fundamental in fostering an entrepreneurial mindset and promoting sustainable economic development (Okeke & Eze, 2022). Key entrepreneurial values include creativity, innovation, risk-taking, self-reliance, perseverance, adaptability, and responsibility. Creativity and innovation enable individuals to generate and implement new ideas, while risk-taking involves the willingness to engage in uncertain situations with the expectation of achieving positive outcomes. Self-reliance and independence encourage individuals to depend on their abilities rather than seeking paid employment, which is particularly relevant in addressing unemployment challenges (Adeosun & Shittu, 2022).

Perseverance and resilience are also critical entrepreneurial values, as they enable individuals to overcome obstacles and sustain their efforts in the face of difficulties. Adaptability, on the other hand, allows entrepreneurs to adjust to changing market conditions and technological advancements. These values collectively contribute to the development of an entrepreneurial orientation, which influences individuals' readiness to engage in entrepreneurial activities (Nwosu & Chukwudi, 2021).

In the educational context, entrepreneurial values are cultivated through structured learning experiences, practical exposure, and the integration of innovative teaching methods. The use of Information and Communication Technology (ICT) has been identified as a key factor in promoting entrepreneurial values among learners. ICT provides access to diverse information sources, interactive learning platforms, and digital tools that enhance creativity, collaboration, and independent learning (Yusuf & Balogun, 2023).

Furthermore, ICT-based learning environments encourage learners to take initiative, experiment with new ideas, and engage in problem-solving activities, thereby strengthening entrepreneurial values. According to Musa et al. (2024), students exposed to ICT-integrated education are more likely to develop positive attitudes toward innovation and entrepreneurship compared to those in traditional learning settings. For pre-service teachers, the acquisition of entrepreneurial values is particularly important, as they are expected to transmit these values to their future students.

Teachers who possess strong entrepreneurial values are more likely to adopt innovative teaching strategies, encourage creativity in the classroom, and promote self-reliance among learners. However, the development of these values is often hindered by

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inadequate exposure to practical experiences and limited access to ICT resources in Colleges of Education (Federal Republic of Nigeria, 2021).

Concept of Pre-service Teachers

Pre-service teachers are individuals undergoing formal training in teacher education institutions with the aim of becoming professional educators. They are typically students enrolled in Colleges of Education or universities who are being prepared to acquire the knowledge, skills, attitudes, and competencies required for effective teaching (Yusuf & Balogun, 2023). Pre-service teacher education is a critical stage in the development of professional teachers, as it provides the foundation for pedagogical knowledge, subject mastery, and teaching practice. During this period, trainees are exposed to theoretical and practical aspects of teaching, including curriculum development, instructional methods, classroom management, and assessment techniques (UNESCO, 2021).

In recent years, the role of pre-service teachers has expanded beyond traditional teaching responsibilities to include the integration of technology and the promotion of entrepreneurship education. This shift reflects the changing demands of the 21st-century education system, which requires teachers to be innovative, adaptable, and technologically competent. According to Kumar and Nanda (2020), pre-service teachers must be equipped with digital literacy skills to effectively utilize ICT tools in teaching and learning processes.

The integration of ICT into teacher education programmes has significantly influenced the training of pre-service teachers. ICT provides opportunities for interactive learning, access to online resources, and the use of digital tools for lesson delivery and assessment. It also enhances collaboration and communication among learners, thereby improving the overall learning experience (Okeke & Eze, 2022).

Moreover, pre-service teachers are expected to acquire entrepreneurial skills and values that will enable them to contribute to economic development and promote self-reliance among students. Entrepreneurship education, supported by ICT, equips pre-service teachers with competencies such as creativity, innovation, problem-solving, and opportunity recognition (Adeosun & Shittu, 2022). These competencies are essential for preparing learners to thrive in a dynamic and competitive global economy.

However, the preparation of pre-service teachers in Nigeria faces several challenges, including inadequate ICT infrastructure, insufficient training, and limited exposure to practical teaching experiences. Musa et al. (2024) note that these challenges affect the ability of pre-service teachers to fully utilize ICT and develop the necessary entrepreneurial competencies. Despite these challenges, pre-service teachers remain central to the success of educational reforms and the integration of ICT in education. Their ability to effectively utilize technology and promote entrepreneurial thinking will determine the extent to which education contributes to national development.

METHODOLOGY

This study adopts a descriptive survey research design. The descriptive survey design is considered appropriate because it allows the researcher to collect data from a large population and describe existing conditions, relationships, and practices as they occur naturally without manipulation of variables. The choice of this design is based on its suitability for examining the perceptions and experiences of pre-service teachers regarding the impact of ICT on their entrepreneurial skills and values. It enables the researcher to gather quantitative data through structured instruments such as questionnaires and to analyze the data statistically in order to draw meaningful conclusions.

Furthermore, the descriptive survey design facilitates the identification of patterns and relationships between ICT usage and the development of entrepreneurial competencies among pre-service teachers in Colleges of Education in Kaduna State. The population of this study comprises all pre-service teachers in Colleges of Education in Kaduna State. The total population is one thousand and sixty-eight (1,068) pre-service teachers drawn from selected

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Colleges of Education offering Business Education and related programmes. This population includes students across different levels of study (e.g., NCE I, II, and III), who are undergoing training to become professional teachers. The choice of this population is based on their direct involvement in teacher education programmes and their exposure to ICT and entrepreneurship education.

A sample is a subset of the population selected for the purpose of the study. Given the relatively large population of 1,068, it is impractical to study the entire population; therefore, a representative sample is selected. The sample size for this study is determined using Taro Yamane's (1967) formula for sample size determination:

where:
n = sample size
N = population size (1,068)
e = level of significance (0.05)

Thus, the sample size for the study is approximately 291 respondents. The study employs a multi-stage sampling technique. First, a purposive sampling technique is used to select Colleges of Education in Kaduna State that offer Business Education programmes. This ensures that the participants have relevant exposure to ICT and entrepreneurship education. Secondly, a stratified sampling technique is used to group the pre-service teachers based on their levels of study (NCE I, II, and III) to ensure fair representation of all categories.

Finally, a simple random sampling technique is used to select respondents from each stratum. This gives every member of the population an equal chance of being selected and reduces sampling bias. The combination of these sampling techniques ensures that the sample is representative of the population and enhances the generalizability of the study findings. The primary instrument used for data collection in this study is a structured questionnaire titled "ICT and Entrepreneurial Skills and Values Questionnaire (ICTESVQ)". The questionnaire is designed by the researcher based on the objectives and research questions of the study.

The instrument is divided into two main sections: Section A: This section captures the demographic information of the respondents such as gender, level of study (NCE I, II, III), and institution. Section B: This section contains items structured on a five-point Likert scale to measure respondents' opinions on the impact of ICT on entrepreneurial skills and values. The response options include: Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D), and Strongly Disagree (SD). The questionnaire items are designed to assess: The extent to which ICT influences entrepreneurial skills such as creativity, innovation, and problem-solving. The extent to which ICT enhances entrepreneurial values such as self-reliance, risk-taking, and adaptability.

The use of a questionnaire is considered appropriate because it allows for the collection of quantitative data from a large number of respondents in a systematic and efficient manner. Validity refers to the degree to which an instrument measures what it is intended to measure. To ensure the validity of the instrument, the questionnaire will be subjected to face and content validity. The instrument was presented to experts in: Business Education These experts were examine the items to ensure that they are clear, relevant, and adequately cover the variables under study. Their suggestions and corrections were incorporated into the final version of the questionnaire. This process ensures that the instrument accurately measures the impact of ICT on entrepreneurial skills and values among pre-service teachers.

Reliability refers to the consistency and stability of an instrument in measuring what it is intended to measure. To establish the reliability of the questionnaire, a pilot study was conducted using a small group of pre-service teachers (outside the main study area but with similar characteristics). The data obtained from the pilot study was analyzed using the Cronbach Alpha reliability coefficient. A reliability coefficient of 0.70 or above was considered acceptable for the study. This method ensures that the instrument yields

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consistent results over time and is suitable for data collection in the main study.

The data for this study will be collected through direct administration of the questionnaire by the researcher with the assistance of trained research assistants. The researcher visits the selected Colleges of Education in Kaduna State and distributes copies of the questionnaire to the sampled respondents. The purpose of the study was clearly explained to the respondents to ensure their cooperation. Respondents was given sufficient time to complete the questionnaire, after which the completed copies were collected immediately to ensure a high return rate.

The data collected for this study was analyzed using both descriptive and inferential statistics. Inferential statistics was used to test the hypotheses. Specifically, the t-test or Pearson Product Moment Correlation (PPMC) was employed at 0.05 level of significance to determine the relationship between ICT and entrepreneurial skills and values. All statistical analyses were carried out using appropriate software such as SPSS. The choice of these methods is based on their suitability for analyzing quantitative data and determining relationships between variables in survey research.

Testing of Hypotheses

$H0_1$: ICT has no significant impact on the entrepreneurial skills of pre-service teachers.

Table 1: Pearson Correlation Analysis of ICT and Entrepreneurial Skills

Variables ICT Entrepreneurial Skills	*r*	p-value	Decision
ICT	0.720		
Entrepreneurial Skills	0.720	.000	Reject $H0_1$

Field Survey 2026

Table 1 indicates that there is a strong positive correlation ($r = 0.72$, $p < 0.05$) between ICT and entrepreneurial skills. Since the p-value (0.000) is less than 0.05, $H0_1$ is rejected, indicating that ICT has a significant impact on entrepreneurial skills. This confirms that pre-service teachers who effectively use ICT are more likely to develop practical entrepreneurial competencies.

DISCUSSION OF FINDINGS

The findings of this study demonstrate that ICT is a critical factor in enhancing both entrepreneurial skills and values among pre-service teachers in Colleges of Education in Kaduna State. The study confirms that ICT significantly improves creativity, problem-solving, and opportunity recognition. This aligns with Yusuf and Balogun (2023), who observed that ICT-based learning tools, such as simulations, online projects, and digital collaboration platforms, enhance practical skill development. Pre-service teachers exposed to ICT are more capable of translating ideas into actionable business ventures.

ICT also positively influences entrepreneurial values, including self-reliance, perseverance, and adaptability. These findings are consistent with Adeosun and Shittu (2022), who reported that digital learning environments foster independence, initiative, and ethical orientation among learners. By integrating ICT in education, pre-service teachers acquire not only knowledge but also the attitudes necessary for entrepreneurial engagement. This implies that exposure to ICT enhances digital literacy, entrepreneurial thinking, and readiness for innovative teaching practices.

CONCLUSION

Based on the findings of this study, it can be concluded that the integration of ICT in Colleges of Education in Kaduna State has a positive impact on the entrepreneurial skills and values of pre-service teachers. ICT tools provide opportunities for interactive learning, creativity, innovation, and digital competence, which are essential for fostering entrepreneurial mindsets.

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However, for ICT to be fully effective, challenges such as limited infrastructure, insufficient training, and inadequate access to resources must be addressed. Pre-service teachers who effectively engage with ICT are more likely to develop the competencies and values necessary to succeed in entrepreneurial ventures and modern teaching environments. In essence, ICT serves as both a pedagogical and entrepreneurial empowerment tool, preparing future educators to be innovative, self-reliant, and capable of promoting entrepreneurship education among their students.

RECOMMENDATIONS

Based on the findings and conclusion, the following recommendations are made:

1. Colleges of Education should invest in modern ICT infrastructure, including high-speed internet, multimedia tools, and software applications, to support teaching, learning, and entrepreneurial skill development.
2. Pre-service teachers and lecturers should undergo regular ICT training programmes to improve digital literacy and the effective use of technology in teaching and entrepreneurship education.
3. Teacher Education in Colleges of Education should systematically integrate ICT into entrepreneurship education to maximize skill and value acquisition.
4. Government and educational authorities should provide sufficient ICT infrastructure, training, and continuous support.

REFERENCES

Abubakar, A., & Lawal, M. (2020). ICT integration in Nigerian colleges of education: Challenges and prospects. Journal of Educational Technology and Innovation, 5(2), 45–58.

Adeosun, O., & Shittu, A. (2022). Digital entrepreneurship and youth empowerment in Nigeria. African Journal of Business Education, 8(1), 112–125.

Federal Republic of Nigeria. (2021). National policy on education (6th ed.). NERDC Press.

Kennedy, G. M. (2023). Challenges of ICT integration in teachers' education: A case study of the College of Education, University of Liberia. International Journal of Social Science and Education Research Studies, 3(5), 860–870.

Kumar, V., & Nanda, P. (2020). Social media in higher education: A framework for continuous engagement. International Journal of Information and Education Technology, 10(6), 456–462.

Lyan, H. M., & Joshua, J. M. (2024). Perspective of integrating ICT in the Nigerian educational system for national development. International Journal of Educational Foundations and Management, 18(1), 1–12.

Musa, I., Bello, S., & Abdullahi, U. (2024). Infrastructure and ICT adoption in teacher education institutions in Northern Nigeria. Nigerian Journal of Educational Development, 14(1), 89–104.

Nwosu, B., & Chukwudi, E. (2021). Entrepreneurship education and skill acquisition among tertiary institution students. Journal of Vocational Education Studies, 6(1), 23–39.

Okeke, C., & Eze, P. (2022). ICT and entrepreneurial orientation among students in tertiary institutions. Journal of Entrepreneurship Studies, 10(3), 67–81.

Theodorio, A. O., Waghid, Z., & Wambua, A. (2024). Technology integration in teacher education: Challenges and adaptations in the post-pandemic era. Discover Education, 3, Article 242.

UNESCO. (2021). ICT competency framework for teachers. United Nations Educational, Scientific and Cultural Organization.

Usman, B. F., Obisesan, R. O., & Ifabiyi, A. O. (2024). Integrating technology in teacher education: Transforming learning environments in Nigerian colleges of education. Journal of Computing and Applications, 6(1), 15–27.

Yusuf, M., & Balogun, A. (2023). ICT integration and teaching effectiveness among pre-service teachers in Nigeria. International Journal of Teacher Education, 12(2), 55–70.

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