



## Analysis of ICT Capacity Needs Of Vocational and Technology Education Lecturers in Universities For Technology -Enhanced Instructions in Abia State, Nigeria

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### ABSTRACT

The study centred on the Information and Communication Technology (ICT) capacity needs of Vocational and Technical Education (VTE) lecturers in universities in Abia State, Nigeria, with a focus on technology-enhanced instruction. The study adopts a descriptive survey research design, targeting 117 VTE lecturers from two public universities in Abia State (Michael Okpara University of Agriculture Umudike and Abia State University, Uturu). A self-structured questionnaire, titled Information and Communication Technology Capacity Needs of VTE Lecturers Questionnaire (ICTCNQ), was administered to assess the digital and ICT skills required by lecturers for the adoption of e-learning platforms, digital instructional materials development, and ICT-based assessments. Data were analyzed using mean, standard deviation, and t-test statistics at a 0.05 significance level. The findings reveal that VTE lecturers require a range of digital skills to leverage educational software for technology-enhanced instruction. These skills include the ability to navigate Learning Management Systems (LMS), use digital tools for assessment, and design interactive online content. Furthermore, lecturers need ICT competencies in creating digital instructional materials, such as multimedia-based lessons, and converting traditional teaching resources into digital formats. The study also emphasizes the need for lecturers to develop skills in conducting ICT-based assessments that are secure, interactive, and aligned with students' learning outcomes. The results indicate no significant gender differences in the ICT skills required, suggesting that both male and female lecturers share similar needs for capacity building. The study concludes that to promote effective technology-enhanced teaching in VTE programs, universities in Abia State must invest in ICT infrastructure and provide continuous professional development for lecturers.

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### INTRODUCTION

The rapid integration of digital technologies into educational systems has

fundamentally transformed the way teaching, learning, assessment, and professional development occur in contemporary higher

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institutions worldwide. Over the past decade, universities have increasingly embraced digital tools such as learning management systems (LMS), virtual laboratories, online simulations, multimedia instructional resources, artificial intelligence-supported platforms, and other Information and Communication Technology (ICT) innovations to enhance pedagogical delivery and expand access to knowledge (UNESCO, 2020; Anderson & Dron, 2017). This global shift, often referred to as digital transformation in education, seeks to modernize instructional processes, improve learning effectiveness, and prepare students with the technological competencies required for the 21st-century workforce. In Nigeria, the push toward digital transformation has intensified due to the demands of a knowledge-driven economy, national education policy reforms, and the increasing need for universities to remain globally competitive (Federal Ministry of Education, 2021).

However, the outbreak of COVID-19 further exposed the urgent need for lecturers to have adequate ICT competence to support technology-driven and blended instructional models (Onyema et al., 2020). Consequently, universities are expected to integrate digital pedagogical approaches that support flexible learning, enhance student engagement, and promote effective delivery of course content. However, achieving this goal depends significantly on the ICT capacity of lecturers, especially those who teach skill-based programmes such as Vocational and Technical Education (VTE). VTE programmes play a central role in national development by equipping learners with vocational, technical, entrepreneurial, and employability skills essential for socioeconomic growth (NBTE, 2020).

With the global evolution of workplace technologies—such as computer-aided design (CAD), robotics, automated tools, digital fabrication, smart workshop equipment, and online technical simulations—VTE instructors are increasingly required to adopt technology-enhanced instructional strategies to adequately train students for real-world industrial tasks (Okoye & Okwelle, 2021). This implies that VTE

lecturers must possess functional digital literacy, pedagogical ICT skills, and the ability to integrate instructional technologies into curriculum delivery.

Despite these expectations, several studies report that many lecturers in Nigerian universities still struggle with inadequate ICT competence, insufficient digital infrastructure, limited access to training, poor institutional support, and low exposure to emerging educational technologies (Afolayan, 2019; Eze, Chinedu & Okonkwo, 2020). These limitations undermine efforts to modernize teaching methods and slow down progress toward achieving sustainable digital transformation in higher education. Given these concerns, investigating the ICT capacity needs of VTE lecturers in universities in Abia State becomes essential. Understanding these capacity gaps will help stakeholders design targeted professional development programmes, strengthen digital readiness, and ultimately promote technology-enhanced instruction that aligns with global standards.

#### STATEMENT OF THE PROBLEM

Despite the increasing global demand for digital competency in higher education, evidence suggests that many VTE lecturers in Nigerian universities are not adequately equipped with the ICT skills required to deliver technology-enhanced instruction. While universities are expected to transition toward digital learning platforms, virtual workshops, multimedia-supported teaching, and other innovations, several persistent challenges hinder this transition. These include inadequate digital literacy among lecturers, limited exposure to modern instructional technologies, insufficient training opportunities, poor availability of ICT infrastructure, and inconsistent institutional support for digital pedagogy. In Abia State universities, these challenges appear more pronounced in Vocational and Technical Education programmes where instructors are required to integrate advanced digital tools for technical demonstration, simulation, design, and workshop-based learning.

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As a result, many VTE courses continue to rely heavily on traditional teaching methods, limiting students' access to modern learning experiences and reducing their readiness for technologically advanced workplaces. The gap between the expected digital pedagogical competencies and the actual ICT capabilities of VTE lecturers creates a major setback in achieving sustainable digital transformation within the university system. The problem of the study, therefore, is that the ICT capacity needs of VTE lecturers necessary for effective technology-enhanced instruction in universities in Abia State remain unclear, under-documented, and insufficiently addressed, thereby hindering progress toward a modernized educational landscape.

#### **Purpose of the study**

The main aim of this work was to assess the Information and Communication Technology Capacity Needs of VTE Lecture in universities for technology – enhanced instructions in Abia state, Nigeria. Specifically. The study intend to;

1. identify the digital skills VTE lecturers require to leverage educational soft wares, effectively for technology – enhanced instructions in Abia state.
2. assess the ICT skills needed by VTE lecturers to design and develop digital instructional materials for lessons so as to ensure technology – enhanced instructions in Abia state.
3. examine the skills required by VTE lecturers to conduct ICT-based assessments that enhance students' learning outcomes for technology – enhanced instructions in Abia state.

#### **Research Questions**

The following research questions guided the study;

1. What are digital skills VTE lecturers require to leverage educational soft wares, effectively for technology - enhanced instructions in Abia state?
2. What are the ICT skills needed by VTE lecturers to design and develop digital

instructional materials for lessons so as to ensure technology - enhanced instructions in Abia state?

3. What are the skills required by VTE lecturers to conduct ICT-based assessments that enhance students' learning outcomes for technology - enhanced instructions in Abia state?

#### **Hypotheses**

The following hypotheses were formulated and tested at 0.05 level of significance.

**H<sub>01</sub>:** There is no significant difference in the mean response of male and female VTE lecturers on the digital skills VTE lecturers require to leverage educational soft wares, effectively for technology - enhanced instructions in Abia state

**H<sub>02</sub>:** There is no significant difference in the mean response of male and female VTE lecturers on the ICT skills needed by VTE lecturers to design and develop digital instructional materials for lessons so as to ensure technology - enhanced instructions in Abia state

**H<sub>03</sub>:** There is no significant difference in the mean response of male and female VTE lecturers on the skills required by VTE lecturers to conduct ICT-based assessments that enhance students' learning outcomes for technology - enhanced instructions in Abia state

#### **THEORETICAL FRAMEWORK**

##### **Human Capital Theory by Schultz in 1967**

Human Capital Theory was propounded by Schultz in 1967 which states that the stock of competences, knowledge and personality attributes embodied in the ability to perform labour so as to produce economic value (Oluwo & Nwabueze, 2016). It is the attributes gained by a worker through education and experience. The work of human capital theory rests on the assumption that capacity building is highly instrumental and even necessary to improve the production capacity of the school. Human capital theory emphasizes on how education increases the productivity and efficiency of workers by increasing the level of cognitive stock of



economically productive human capability, which is a product of innate abilities and investment in human beings (Oluwuo & Nwabueze, 2016). The provision of formal education is seen as a productive investment in human capital, which the proponents of the theory have considered as equally or even more equally worthwhile than that of physical capital.

According to Fagerlind and Saha (1997), human capital theory provides a basic justification for large public expenditure on education both in developing and developed nations. The theory was consistent with the ideologies of democracy and liberal progression found in most Western societies. Its appeal was based upon the presumed economic return of investment in education both at the macro and micro levels. Efforts to promote investment in human capital were seen to result in rapid economic growth for society. For individuals, such investment was seen to provide returns in the form of individual economic success and achievement. Most educationists agree that it is human resources of nation, not its capital nor its material resources that ultimately determine the character and pace of its economic and social development. It increases their chances of employment in the labour market, and allows them to reap pecuniary and non-pecuniary returns and gives them opportunities for job mobility. Education however, is a source of economic growth and development only if it is anti-traditional to the extent that it liberates, stimulates and informs the individual and teaches him how and why to make demands upon himself.

Accordingly, a human capacity building would manifest itself in staff performance and the quality of graduates produced. This theory is not only imperative but also indispensable to the achievement of educational and organizational goals. Hence, when lecturers are properly equipped with their capacity building needs through ICT, it boosts up their morale to perform their duties effectively. This enhances the quality service delivery

## METHODOLOGY

The study adopted descriptive survey research design and it was considered suitable because the opinion of a representative sample of respondents was sought using questionnaire and the finding was generalized on the entire population. The target population consisted of 117 Vocational and Technical Education lecturers drafted from the 2 Public Universities in Abia state, Nigeria (i. e – 64 VTE Lecturers from MOUAU and 53 VTE lecturers from ABSU). However, there is no department of Technical and Vocational Education (TVE) being run in the Universities located in area of the study, nevertheless the programmes of TVET exist in the area of study: Agricultural Education, Business Education, and Home Economics Education.

Additionally, there was no sampling carried out because of the manageable number of the population; hence the whole population was used as the sample. The instrument for data collection was questionnaire titled: Information and Communication Technology Capacity Needs of VTE Lecturers Questionnaire (ICTCNQ). The questionnaire was developed from literature by the researchers and used for data collection. The instrument was a four-point response scale of strongly agreed (SA), Agreed (A), Disagreed (D) and strongly disagreed (SD) with corresponding values of 4, 3, 2, and 1 respectively.

The instrument was face – validated by three experts: Two from Vocational and Technical Education Department and one from Measurement and Evaluation Department- all in University of Nigeria, Nsukka and Michael Okpara University of Agriculture, Umudike respectively. Their corrections and suggestions were utilized to improve the initial copies of the questionnaire to produce the final copies. Cronbach's Alpha reliability method was adopted to determine the internal consistency of the questionnaire items. A Cronbach Alpha coefficient of 0.81 was obtained and the collected data was analyzed using mean for research questions and t-test was used for the test of hypothesis. Any mean response of 2.50 and above was considered positive or agreed while any mean response below 2.50 was considered negative or disagreed, more so the hypothesis was tested at 0.05 level of significant.

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## RESULTS

### Research Question 1

What are digital skills VTE lecturers require to leverage educational soft wares, effectively for technology - enhanced instructions in Abia state?

### Hypothesis 1

Table 1: Mean and Standard Deviation on digital skills VTE lecturers require to leverage educational soft wares, effectively for technology - enhanced instructions (n=117)

S/N	Item statements	$\bar{X}$	SD	Sig.	Rmk
1	VTE lecturers require the ability to navigate and use standard e-learning platforms (e.g., LMS) for course delivery	3.33	.73	.55	Agreed, NS
2	VTE lecturers require skills to use digital tools for tracking and grading students' performance	3.40	.64	.33	Agreed, NS
3	VTE lecturers need competence in designing computer-based tests (CBT) for practical and theoretical courses	3.40	.64	.06	Agreed, NS
4	VTE lecturers require the ability to administer online assessments securely to prevent examination malpractice	3.31	.73	.52	Agreed, NS
5	VTE lecturers need the skill to analyze digital assessment reports to improve instructional decisions.	3.26	.68	.99	Agreed, NS
6	VTE lecturers require the ability to integrate automated feedback systems into assessments.	3.26	.68	.77	Agreed, NS
7	VTE lecturers need competence in using mobile-based assessment tools for student evaluation.	3.25	.76	.92	Agreed, NS
8	VTE lecturers require skills to design interactive and simulation-based assessments for VTE courses.	3.22	.75	.99	Agreed, NS
9	VTE lecturers need the capacity to evaluate students' digital submissions (videos, digital projects, scanned worksheets).	3.22	.75	.99	Agreed, NS
10	VTE lecturers require skills to use rubrics and digital scoring tools for objective assessment of student performance.	3.23	.77	.97	Agreed, NS

Key: SD = Standard Deviation of the respondents and  $\bar{X}$  = Mean of the respondents

Data in Table 1 revealed that all that the 10 items had their mean ratings ranging from 3.22 to 3.40 and were above the cut-off point of 2.50. This indicated that the respondents agreed on all the identified digital skills VTE lecturers require to leverage educational soft wares, effectively for technology - enhanced instructions in Abia state. The standard deviation of the 10 items ranged from .64 to .77, which showed that the respondents were not too far from the mean and opinion of one another in their responses on the digital skills VTE lecturers require to leverage educational soft wares,

There is no significant difference in the mean response of male and female VTE lecturers on the digital skills VTE lecturers require to leverage educational soft wares, effectively for technology - enhanced instructions in Abia state

Data for answering research question 1 and hypothesis are presented in Table 1

effectively for technology - enhanced instructions in Abia state. The p-values on all the items were all greater than the alpha-value of 0.05. With the forgoing, we therefore accept the null hypothesis for the items and reject the alternate hypothesis, which means there is no significant difference between the mean responses of male and female VTE lecturers on the digital skills VTE lecturers require to leverage educational soft wares, effectively for technology - enhanced instructions in Abia state.

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### Research Question 2

What are the skills required by VTE lecturers to conduct ICT-based assessments that enhance students' learning outcomes for technology - enhanced instructions in Abia state?

There is no significant difference in the mean response of male and female VTE lecturers on the ICT skills needed by VTE lecturers to design and develop digital instructional materials for lessons so as to ensure technology - enhanced instructions in Abia state

### Hypothesis 2

Data for answering research question 2 and hypothesis are presented in Table 2

Table 2: Mean and Standard Deviation on the ICT skills needed by VTE lecturers to design and develop digital instructional materials for lessons so as to ensure technology - enhanced instructions (n=117)

S/N	Item statements	$\bar{x}$	SD	Sig.	Rmk
1.	VTE lecturers need skills to create lesson presentations using digital tools such as PowerPoint or Canva.	3.31	.73	.55	Agreed, NS
2.	VTE lecturers require the ability to develop multimedia-based instructional materials for practical lessons.	3.40	.64	.06	Agreed, NS
3.	VTE lecturers need competence in using authoring tools (e.g., Google Classroom tools, eXeLearning) to design digital content.	3.39	.63	.07	Agreed, NS
4.	VTE lecturers require skills to convert traditional classroom materials into digital formats.	3.31	.73	.52	Agreed, NS
5.	VTE lecturers need the ability to edit images, audio, and video for instructional purposes.	3.28	.70	.06	Agreed, NS
6.	VTE lecturers require competence in designing digital modules or e-content for blended learning.	3.26	.68	.77	Agreed, NS
7.	VTE lecturers need skills to create step-by-step digital manuals or guides for technical tasks.	3.24	.76	.92	Agreed, NS
8.	VTE lecturers require the ability to integrate interactive elements (quizzes, animations, hyperlinks) into digital materials.	3.22	.75	.98	Agreed, NS
9.	VTE lecturers need competence in organizing and structuring digital instructional content for clarity and accessibility.	3.22	.75	.98	Agreed, NS
10.	VTE lecturers require the skills to evaluate the quality and accuracy of digital instructional materials before use	3.21	.77	.97	Agreed, NS

SD = Standard Deviation of the respondents and  $\bar{X}$  = Mean of the respondents

Data in Table 2 revealed that all the 10 items had their mean ratings ranging from 3.21 to 3.40 and were above the cut-off point of 2.50. This indicated that the respondents agreed on all the identified ICT skills needed by VTE lecturers to design and develop digital instructional materials for lessons so as to ensure technology - enhanced instructions in Abia state, Nigeria. The standard deviation of all the 10 items ranged from .63 to .77, which showed that the respondents

were not too far from the mean and opinion of one another in their responses on the ICT skills needed by VTE lecturers to design and develop digital instructional materials for lessons so as to ensure technology - enhanced instructions in Abia state. The p-values on all the items were all greater than the alpha-value of 0.05. With the foregoing, we therefore accept the null hypothesis for the items and reject the alternate hypothesis, which means there is no significant difference

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between the mean responses of male and female VTE lecturers on the ICT skills needed by VTE lecturers to design and develop digital instructional materials for lessons so as to ensure technology - enhanced instructions in Abia state

### Research Question 3

What are digital skills VTE lecturers require to leverage educational soft wares, effectively for technology - enhanced instructions in Abia state?

### Hypothesis 3

There is no significant difference in the mean response of male and female VTE lecturers on the skills required by VTE lecturers to conduct ICT-based assessments that enhance students' learning outcomes for technology - enhanced instructions in Abia state

Data for answering research question 3 and hypothesis are presented in Table 3.

Table 3: Mean and Standard Deviation on digital skills VTE lecturers require to leverage educational soft wares, effectively for technology - enhanced instructions (n=117)

S/N	Item statements	$\bar{X}$	SD	Sig.	Rmk
1	VTE lecturers need the ability to create online quizzes and examinations on e-assessment platforms.	3.31	.72	.54	Agreed, NS
2	VTE lecturers require skills to use digital tools for tracking and grading students' performance	3.40	.64	.33	Agreed, NS
3	VTE lecturers need competence in designing computer-based tests (CBT) for practical and theoretical courses.	3.39	.63	.05	Agreed, NS
4	VTE lecturers require the ability to administer online assessments securely to prevent examination malpractice	3.31	.73	.52	Agreed, NS
5	VTE lecturers need the skill to analyze digital assessment reports to improve instructional decisions.	3.26	.68	.99	Agreed, NS
6	VTE lecturers require the ability to integrate automated feedback systems into assessments.	3.27	.69	.78	Agreed, NS
7	VTE lecturers need competence in using mobile-based assessment tools for student evaluation	3.25	.76	.92	Agreed, NS
8	VTE lecturers require skills to design interactive and simulation-based assessments for VTE courses	3.21	.74	.98	Agreed, NS
9	VTE lecturers need the capacity to evaluate students' digital submissions (videos, digital projects, scanned worksheets).	3.22	.75	.99	Agreed, NS
10	VTE lecturers require skills to use rubrics and digital scoring tools for objective assessment of student performance.	3.23	.77	.97	Agreed, NS

Key: SD = Standard Deviation of the respondents and  $\bar{X}$  = Mean of the respondents

Data in Table 3 revealed that all that the 10 items had their mean ratings ranging from 3.21 to 3.40 and were above the cut-off point of 2.50. This indicated that the respondents agreed on all the identified digital skills VTE lecturers require to leverage educational soft wares, effectively for technology - enhanced instructions in Abia state. The standard deviation of the 10 items ranged from .63 to .77, which

showed that the respondents were not too far from the mean and opinion of one another in their responses on the digital skills VTE lecturers require to leverage educational soft wares, effectively for technology - enhanced instructions in Abia state. The p-values on all the items were all greater than the alpha-value of 0.05. With the forgoing, we therefore accept the null hypothesis for the items and reject the alternate hypothesis,

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which means there is no significant difference between the mean responses of male and female VTE lecturers on the skills required by VTE lecturers to conduct ICT-based assessments that enhance students' learning outcomes for technology - enhanced instructions in Abia state.

## DISCUSSION OF FINDINGS

The findings were discussed based on the following sub-heading derived from the study objectives and research questions: digital skills VTE lecturers require to leverage educational soft wares, effectively for technology - enhanced instructions, ICT skills needed by VTE lecturers to design and develop digital instructional materials for lessons so as to ensure technology - enhanced instructions and skills required by VTE lecturers to conduct ICT-based assessments that enhance students' learning outcomes for technology - enhanced instructions in Abia state, Nigeria.

The findings for research question 1 indicate that VTE lecturers in Abia State universities agreed on the necessity of acquiring a range of digital skills to effectively leverage educational software for technology-enhanced instruction. The digital skills identified include the ability to navigate and use standard e-learning platforms (such as Learning Management Systems), utilize digital tools for tracking and grading students' performance, design computer-based tests (CBT), administer online assessments securely, analyze digital assessment reports, integrate automated feedback systems, and use mobile-based assessment tools. These skills are crucial in enabling VTE lecturers to deliver instructional content in a manner that aligns with the demands of modern education and prepares students for the technology-driven workforce.

The results of the study are in line with previous studies that have emphasized the importance of digital skills for effective teaching and learning. According to Anderson and Dron (2017) and UNESCO (2020), the integration of ICT in education requires teachers to be digitally literate and proficient in using technology to facilitate learning. Additionally, the study reveals that there was no significant difference between the responses of male and female lecturers

concerning these digital skills, suggesting that both genders equally acknowledge the need for such ICT competencies. The findings corroborate the need for comprehensive training programmes aimed at enhancing the ICT capacity of lecturers, as discussed by Onyema et al. (2020), who highlighted the increasing demand for ICT competence in Nigerian universities. More so, the views and observations of the authors cited on the digital skills VTE lecturers require to leverage educational soft wares, effectively for technology - enhanced instructions helped to justify the findings of the study on research question 1.

The second research question explored the ICT skills necessary for VTE lecturers to design and develop digital instructional materials. The findings show that VTE lecturers require various ICT skills to create lesson presentations using tools like PowerPoint or Canva, develop multimedia-based instructional materials, use authoring tools such as Google Classroom and eXeLearning, convert traditional materials into digital formats, and integrate interactive elements (e.g., quizzes, animations, and hyperlinks) into digital content. These competencies are essential for developing dynamic and engaging instructional materials that can enhance student learning and align with the evolving educational landscape. These results are consistent with previous studies that have emphasized the role of instructional technology in vocational and technical education. Afolayan (2019) stressed the importance of developing digital instructional materials to support blended learning in vocational education.

The findings also indicate no significant difference between male and female lecturers regarding the ICT skills required for digital content creation, further supporting the idea that both genders equally recognize the importance of these skills in ensuring effective technology-enhanced instruction. This aligns with the recommendations of Eze et al. (2020), who called for targeted professional development programmes for lecturers to improve their capacity in using digital tools for instructional material development. The views and observations of the authors cited on the ICT skills needed by VTE lecturers to design and develop digital

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instructional materials for lessons so as to ensure technology - enhanced instructions helped to validate the findings of the study in Table 2.

The third research question focused on the skills needed by VTE lecturers to conduct ICT-based assessments that enhance students' learning outcomes. The findings reveal that VTE lecturers need to be proficient in creating online quizzes and examinations, using digital tools for performance tracking and grading, designing interactive and simulation-based assessments, evaluating students' digital submissions, and utilizing rubrics and digital scoring tools for objective assessment of student performance. These competencies are vital for ensuring that assessments are conducted in a fair, secure, and efficient manner, while also providing valuable feedback to students.

The results support the findings of Okoye and Okwelle (2021), who emphasized the importance of incorporating technology into assessments to improve learning outcomes. Additionally, the study showed that there was no significant difference between male and female lecturers in terms of their responses regarding the skills required for ICT-based assessments, indicating that both male and female lecturers acknowledge the importance of these skills for improving students' learning outcomes. This highlights the need for universities to invest in training programmes that focus on enhancing the assessment capabilities of lecturers, as discussed by Anderson and Dron (2017). More so, the views and observations of the authors cited on the skills required by VTE lecturers to conduct ICT-based assessments that enhance students' learning outcomes for technology - enhanced instructions in Abia state, Nigeria helped to justify the findings of the study on research question 3.

## CONCLUSION

The study concluded that VTE lecturers in Abia State universities require a variety of ICT skills to effectively deliver technology-enhanced instruction. These include digital skills for using educational software, ICT skills for designing and developing digital instructional materials, and skills for conducting ICT-based assessments that

enhance student learning outcomes. The study further revealed that there is no significant gender difference in the responses of VTE lecturers regarding the ICT skills required, indicating that both male and female lecturers equally recognize the need for ICT competency in vocational and technical education.

## RECOMMENDATIONS

Based on the findings of the study, the following recommendations are made:

1. VTE lecturers should be provided with regular and comprehensive ICT training programmes to enhance their digital literacy and pedagogical ICT skills. These training sessions should cover a wide range of skills, including e-learning platform usage, multimedia content creation, and ICT-based assessment methods.
2. Universities should invest in adequate ICT infrastructure, including reliable internet access, multimedia equipment, and learning management systems, to support the adoption of technology in VTE programmes.
3. Universities should encourage the creation and integration of digital instructional materials, such as multimedia-based lessons, e-content, and simulation tools, to make learning more interactive and engaging for students.
4. University administrations should provide continuous support for VTE lecturers by offering resources for developing ICT-based teaching and learning tools and creating a conducive environment for digital pedagogy.
5. Since the study found no significant gender differences in ICT competencies, universities should ensure that training programmes are inclusive and accessible to all lecturers, irrespective of gender.

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