

IMPACT OF CLOUD-BASED ACCOUNTING EDUCATION AND INNOVATIVE EFFICIENCY OF ACCOUNTANTS IN PUBLIC TERTIARY INSTITUTIONS IN ONDO STATE

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Abstract

The study assesses the impact of cloud-based accounting education on innovative efficiency of accountants in public tertiary institutions in Ondo State, Nigeria. The study employed a qualitative research design with a population of nine (9) government approved public tertiary institutions in the State having a staff population of (325) that comprises lecturer, bursary and internal audit staff only. Stratified and purposive sampling techniques were adopted to select the sample size of six (6) public tertiary institutions. Krejcie and Morgan sample calculator were used to select a sample size of One hundred and fifty-two (152) from the population sampled. The instrument used for this study was a questionnaire. Data obtained were analysed using descriptive and Analysis of Variance (ANOVA) statistics to test the research hypotheses. The findings revealed that cloud-based accounting education offers various benefits, such as remote accessibility and collaborative learning opportunities which does not significantly enhance the innovative efficiency of accountants. The skill development emerges as a more critical factor in driving innovation among accountants. Thus, concluded that cloud-based accounting education provides a platform for enhancing innovative skills among the accounting profession in public tertiary institutions in Ondo State. The study recommended that public tertiary institutions should prioritize skill development programs to foster innovative efficiency among accountants.

Keywords: *Cloud-Based, Accounting Education, Innovative Efficiency and Accountants*

Introduction

Public tertiary institutions in Nigeria are government-funded higher educational institutions that provide post-secondary education and training. These institutions play a crucial role in the Nigerian education system and contribute significantly to the country's human capital development. The institutions in Nigeria thus include universities, polytechnics, and colleges of education. The government typically funds the institutions through budgetary allocations. However, these institutions face a mirage of challenges, such as inadequate funding, innovative technological deficiency, occasional labour disputes, declining oil revenue, and security issues like Boko Haram and banditry, and tax burdens. These challenges have subsequently led to a reduction in the funding allocated to these tertiary institutions (Nwadiani, 2013). Even in Ondo State, where these institutions are located, the meager federal and state allocations have had an impact, further straining the financial resources available to government-owned tertiary institutions. Despite these challenges, public tertiary institutions remain vital for providing accessible and affordable higher education to a large number of Nigerian students. They also contribute to research, innovation, and the



development of skilled professionals in various fields and thereby contributing to the country's socioeconomic growth and development.

There is a fast growing intersection between cloud-based accounting education and innovation efficiency among the accountants in Nigeria. However, there are challenges needed to be addressed to realize the potential benefits of cloud-based accounting education. For instance, lack of integration between cloud-based accounting education and industry needs, which can limit the potential for innovation efficiency of accountants (Gomes et al., 2019). Furthermore, the barriers to collaboration between cloud-based accounting education and industry practitioners can hinder innovation efficiency of accountants. The intersection is a complex and evolving area of research. Further studies are needed to explore the potential benefits and challenges associated with the adoption of cloud-based accounting education and innovation efficiency of accountants. Akhtar et al., (2019); Lin and Chen (2020) suggested that cloud-based accounting education has the potential to drive innovation efficiency of accountants in the industry. The innovative efficiency of accountants in public tertiary institutions is pivotal in effectively managing financial resources, guaranteeing their long-term sustainability. Adeyemi and Akande (2021) expressed that accountants working within these institutions confront distinctive challenges that necessitate innovative strategies for improving the teaching and learning processes, preparation and presentation of financial reports while addressing unprecedented issues. The concept of innovation efficiency has been widely studied in the literature, and it has been linked to various factors such as organizational culture, leadership, and technology adoption (Johannessen, 2019).

Thus, the term cloud-based accounting education refers to the use of cloud computing technology in the delivery of accounting education. The technology enables access to accounting resources and software applications from anywhere and at any time, using a web browser or mobile application, thus increasing the flexibility of accounting education (Lin & Chen, 2020). This type of education can include online courses, virtual classrooms, and interactive learning resources hosted on cloud-based platforms. It can also involve collaborative tools such as cloud-based storage, file sharing, and real-time communication tools to facilitate interaction between students and instructors. The goal of cloud-based accounting education is to enhance learning experiences, improve access to resources, and increase the innovation efficiency of accountants. On the other hand, innovation efficiency refers to the ability of an organization to develop and implement innovative solutions effectively and efficiently.

Cloud-based accounting education and innovation efficiency are indeed interrelated concepts that have been gaining attention globally, including in Nigeria. The use of cloud-based technology in accounting education has been shown to have several benefits, such as improving student engagement, enhancing learning outcomes, and increasing productivity of an accountant in the industry. Adeyemo and Oni (2020) established that the use of cloud-based technology in accounting education improved students' learning outcomes, particularly in terms of critical thinking and problem-solving skills. However, the potential of cloud-based accounting education is to enhance students' learning experiences, particularly through collaborative tools and virtual classrooms (Olawumi et al., 2020).

Uzoka et al. (2017) found that the use of cloud-based technology improved the speed, accuracy, and accessibility of accounting information, leading to increased productivity and innovation in the accounting industry. These has gained prominence in recent years due to the benefits it offers students and accounting professionals. The use of cloud technology in accounting education allows students to access accounting tools and software from anywhere, collaborate with peers and instructors, and engage in hands-on learning activities. Therefore, cloud-based technology can boost innovation efficiency and educational outcomes on cloud computing, accounting professionals abilities, and knowledge, work productively with clients and streamline their workflows.

Nigeria's conventional accounting education system has grappled with a multitude of challenges. These hitches have culminated in a deficit of proficient accountants equipped with innovative skills to navigate the ever-changing business realm. Nonetheless, the adoption of cloud-based accounting education holds the potential to mitigate these challenges and elevate the competence of accountants in Nigeria. The questions raised motivate of researchers to carryout the study. To what extent does remote accessibility impact the innovative efficiency of accountants? How often does collaborative learning enhance the innovative efficiency of accountants? Does accounting skill development influence the innovative efficiency of accountants in public tertiary institutions in Ondo State, Nigeria?

Biased investment in research and development for cloud-based accounting education. This has the potential to drive innovation and efficiency gains in the accounting industry. There may be a need for more investment in research and development in this area (Akhtar et al., 2019). Barriers to collaboration between cloud-based accounting education and industry are essential for driving innovation and efficiency



gains in the accounting industry. However, there may be barriers to collaboration, such as differences in priorities and incentives (Lin & Chen, 2020). Also, the challenges in measuring the impact of cloud-based accounting education on innovation efficiency have the potential to drive innovation and efficiency gains in the accounting industry. It can be challenging to measure the impact of these educational programs on the industry as a whole (Loh, 2019). Overall, literature supports the use of cloud-based technology in accounting education. Cloud-based accounting education offers numerous benefits, including improved learning outcomes, enhanced technical skills, and increased collaboration and communication among students and instructors (Tawfik, & Elmaasrawy, 2022). However, this framework enables researchers to understand the relationships between the variables under investigation. It also helps to develop a structured approach to study, guiding the formulation of hypotheses, data collection, and data analysis. Below is the framework ex-ray the linkage among the variables.

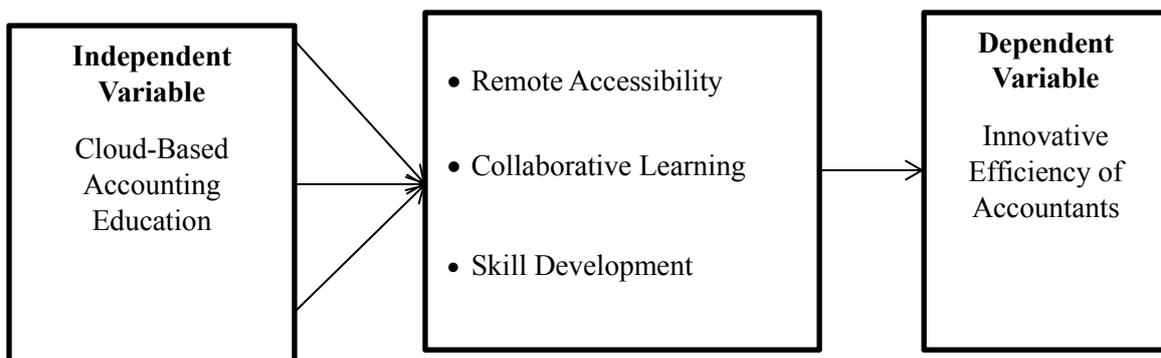


Figure 1: Conceptual Framework. Source: *Researcher Self-Development (2023)*

Cloud-Based Accounting Education

This represents a modern paradigm for the delivery of accounting instruction, harnessing the capabilities of cloud computing technology. This innovative approach transforms the manner in which accounting students interact with learning materials, collaborate with educators and fellow learners, and immerse themselves in accounting principles and tools. The essence of this concept lies in leveraging the internet to facilitate access to a wealth of accounting resources, software applications, and educational content. It eliminates the necessity for physical infrastructure, localized software installations, and the traditional confines of a classroom (Fitzgerald & Dennis, 2014). Cloud-based accounting education leverage on the following key elements.

Remote Accessibility

Remote accessibility in the context of cloud-based accounting education refers to the ability of students and instructors to access educational resources, course materials, and software applications from anywhere with an internet connection. This accessibility has become a fundamental feature of modern education, enabling flexibility and convenience for learners. Therefore, students can access accounting course materials and software applications from anywhere with an internet connection. This flexibility enables remote learning, which is especially valuable in situations where physical attendance is challenging or impossible (Eze & Onyishi, 2021). Cloud-based platforms often provide access to the latest accounting software, ensuring that students learn on up-to-date tools and technologies used in the accounting profession (Alqahtani, Alharthi, & Alqarni, 2019).

Collaborative Learning

Cloud-based platforms facilitate collaboration among students and instructors. Features like discussion forums, virtual classrooms, and shared documents promote engagement and interaction, allowing students to collaborate on assignments and projects regardless of their physical locations (Lin & Chen, 2020). These platforms can adapt to individual learning styles and paces. Students can progress through course materials at their own speed, receive tailored feedback, and explore additional resources as needed (Grabski & Leech, 2015). Thus, cloud-based accounting education technologies promote interactive and engaging learning experiences. They often include multimedia elements, simulations, and real-world scenarios that enhance comprehension and retention (Alqahtani, Alharthi, & Alqarni, 2019).



Skill Development

Skill development is a crucial aspect of cloud-based accounting education, focusing on enhancing students' proficiency in accounting practices and related technologies. Cloud-based accounting education equips students with the technical skills required for modern accounting practices. It provides hands-on experience with accounting software, data analysis tools, and cloud-based platforms (Boonlertvanich & Li, 2019). The adaptability of accounting courses fosters the ability to adjust to new changes by the students. They become proficient in using a variety of accounting software and tools, making them more versatile and prepared for the rapidly evolving field of accounting (Lin & Chen, 2020). This element does not only impart technical accounting knowledge but also fosters critical thinking, problem-solving, and communication skills, which are highly valued in the accounting profession (Boonlertvanich & Li, 2019). Despite the potential advantages of cloud-based accounting education, its adoption may face challenges in certain regions, such as limited internet access, inadequate infrastructure, and the cost of acquiring and maintaining the necessary equipment and software (Eze & Onyishi, 2021). Nevertheless, many educational institutions are recognizing the benefits of cloud-based accounting education and working to address these challenges to improve the quality of accounting graduates. It also aligns with the demands of the ever-evolving accounting profession and prepares students with the skills and knowledge needed for success in a dynamic and technology-driven field.

Concept of Innovative Efficiency of Accountants

The concept of innovative efficiency of accountants refers to the capacity of accounting professionals to employ innovative methods and technologies effectively in their financial management and reporting duties. It encompasses the ability to leverage contemporary tools, techniques, and practices to enhance the efficiency, accuracy, and value of financial processes (Marques et al., 2020). In today's dynamic and technology-driven business landscape, accountants must adapt to new tools and methods to remain effective in their roles. Innovative efficiency involves staying current with the latest accounting software, data analytics, and automation technologies. It also encompasses the creative application of these tools to streamline financial operations, provide valuable insights, and contribute to strategic decision-making within organizations (Marques et al., 2020). Accountants with innovative efficiency can proactively identify opportunities for process improvement, cost reduction, and enhanced financial control. They can harness data analytics to uncover trends and anomalies, aiding in fraud detection and risk management. Furthermore, they can contribute to the development of data-driven strategies that drive business growth and sustainability (García-Blandón & Argilés-Bosch, 2018).

Eze and Onyishi (2021) investigated the multifaceted challenges posed by the pandemic and its far-reaching impacts on the realm of education in Nigeria. A sequential exploratory mixed-method research design was employed, which involved both quantitative and qualitative data collection and analysis. The findings of the study illuminated several key challenges brought about by the pandemic. These challenges encompassed the closure of educational institutions, hindrances to effective learning, disparities in access to educational opportunities, and deficits in essential skills. Furthermore, the study revealed the extensive adverse effects of the pandemic on the educational sector. These repercussions included a decline in school enrollment rates, exacerbated educational inequalities, diminished academic achievement, compromised school health conditions, and disruptions in the processes of educational assessment and student transition. The study's findings also underscore the urgency of embracing electronic learning (e-learning) as a viable solution for the education sector in Nigeria. This shift towards digital education has significant implications for policy formulation and educational practices.

Beredugo (2023) explored cutting-edge accounting technology, such as cloud-based accounting information systems, which has emerged as a prominent solution for delivering online accounting and auditing services. The study adopted a survey research design, collecting data from a sample of 385 respondents representing 32 companies spanning four distinct sectors in Nigeria. The analysis of data was conducted employing statistical tools such as the Chi-square test and Analysis of Variance (ANOVA) to scrutinize the hypotheses. The findings of this study unequivocally support the notion that cloud-based accounting significantly contributes to enhancing the operational efficiency of firms in Nigeria. However, when it comes to gauging the perceptions of respondents regarding the deployment of cloud accounting and its potential implications for corporate exigencies in Nigeria, the results reveal a notable absence of significant differences. This implies that concerns related to unauthorized access risks, inadequate access control mechanisms, and elevated IT service costs, among others, do not substantially diverge among the respondents.



Ezuwore-Obodoekwe, Okoye, and Obinabo (2020) conducted a study to assess the influence of cloud accounting on the performance of the Nigerian banking sector. They utilized annual data spanning from 2008 to 2017 and employed the Ordinary Least Squares (OLS) technique for their analysis. The research findings from this investigation indicate that private cloud computing exerts a substantial impact on the profit after tax of the Nigerian banking industry. Furthermore, the study unveiled that the community cloud also plays a role in influencing revenues after taxes within the Nigerian banking sector.

Effiong, Udoayang, and Davies (2020) embarked on an inquiry aimed at examining the repercussions of cloud accounting on the harmonization of cost structures among manufacturing-oriented enterprises listed on the Nigerian Stock Exchange. Their investigation involved a practical assessment of the feasibility of cloud accounting within manufacturing enterprises by comparing cloud-related expenses with the cost structures of these manufacturing firms. They employed the least squares random effect technique to build their estimated model. They initiated their calculations by taking the price of the server as a starting point for estimating costs related to the power bill, maintenance, the network, and the physical infrastructure of the organization. Their results indicate a negative association between direct expenditure and the price of the server, network, and building. Conversely, they found a positive correlation between direct expenditure and the price of maintenance and electricity. Costs linked with servers and infrastructure exhibited a positive relationship with indirect expenses, while those associated with electricity, maintenance, and networks showed an adverse correlation.

Matarneh, Al-Tahat, Ali, and Jwaifel (2019) delved into an examination of the impact of cloud accounting on the competitive advantage of Jordanian industrial enterprises. Their study employed descriptive and analytical methodologies, incorporating the multi-linear correlation test. The inquiry generated several key findings, highlighting the role of various dimensions of cloud accounting (such as providing information technology infrastructure, software to users, communications, user-friendly applications, flexibility in task execution, and cost savings) in facilitating a competitive advantage for Jordanian industrial companies. The study emphasized the significance of these dimensions in achieving competitive advantages across areas like quality, cost, flexibility, and differentiation.

Osama (2018) emphasized the critical importance of Jordanian public shareholding enterprises aspiring to leadership in the digital era with the adoption of cloud accounting to fortify their regulatory tools. These regulatory mechanisms require internal auditors to possess a distinctive intellectual capital element to keep pace with the evolving information economy and the data generated through cloud accounting. The study argued that internal auditors should exhibit leadership skills, including the capacity for observation, critical thinking, and sophisticated reasoning, which are essential for interpreting and connecting the phenomena and observations occurring within the organization when cloud accounting mechanisms are utilized. The study drew insights from existing literature to underscore the pivotal nature of internal auditors' possession of the concept of leadership in navigating the challenges and opportunities presented by cloud accounting.

Hypotheses

The following hypotheses guide the study.

1. There is no significant impact between the remote accessibility and the innovative efficiency of accountants in public tertiary institutions in Ondo State.
2. There is no significant influence between collaborative learning and the innovative efficiency of accountants in public tertiary institutions in Ondo State.
3. There is no significant association between accounting skill development and the innovative efficiency of accountants in public tertiary institutions in Ondo State.

Methodology

The study employed a qualitative research design with a population of nine (9) government approved public tertiary institutions in the State having a staff population of (325) that comprises lecturer, bursary and internal audit units only. Stratified and purposive sampling techniques were used to select the sample size of six (6) public tertiary institutions which makes a total of (245) samples. Krejcie and Morgan calculator were used to select a sample size of One hundred and fifty-two (152). The instrument used for this study was a questionnaire. This instrument was validated and the reliability of the study was done using cronbach Alpha statistics and revealed a coefficient of 0.721. Data obtained were analysed using descriptive and Analysis of Variance (ANOVA) statistics to test the research hypotheses.



Table 1: Population and Sample Distribution of the Respondents

Institutions Sampled	Population	Sample Size
Federal University of Technology, Akure*	50	$50 \times 152/245 = 31$
Adeyemi College of Education, Ondo*	58	$58 \times 152/245 = 36$
Federal Polytechnic, Ile-Oluji *	42	$42 \times 152/245 = 26$
University of Medical Sciences, Ondo**	36	$36 \times 152/245 = 22$
Rufus Giwa Polytechnic, Owo**	49	$49 \times 152/245 = 31$
College of Health Technology, Akure**	10	$10 \times 152/245 = 06$
Total	245	152

Source: Field survey, (2023); **Key:** *Federal owned institutions, ** State-owned institutions

Results and Discussion of Findings

Table 2: Descriptive Statistics of the Respondents

Variables	N	Mean	Std. Deviation	Skewness	Kurtosis
	Statistic	Statistic	Statistic	Std. Error	Statistic
Innovative Efficiency	152	2.29	.851	-.137	1.97
Remote Accessibility	152	2.37	.904	.128	1.97
Collaborative Learning	152	2.20	.833	.019	1.97
Skill Development	152	2.13	.879	.168	1.97
Valid N (listwise)	152				

Source: Author's Computation/Field Survey (2023)

Table 2 above presents the descriptive statistics for the dependent and independent variables. This includes the mean, standard deviation, skewness, and kurtosis. Specifically, the mean and standard deviation values for each variable are as follows: innovative efficiency (mean = 2.29, standard deviation = 0.851), remote accessibility (mean = 2.37, standard deviation = 0.904), collaborative learning (mean = 2.20, standard deviation = 0.833), and skill development (mean = 2.13, standard deviation = 0.879). These values indicate that the data points are relatively concentrated around their respective means, suggesting a certain level of consistency within the dataset. The results provided above substantiate the statistical relationships among these variables. In the context of this sample, consisting of 152 respondents, it is noteworthy that both skewness and kurtosis values fall below 1.00. This observation is significant as it indicates the normality of the data distribution. Moreover, the standard error helps to gauge the extent to which the data deviates from an idealized normal distribution. It is essential to acknowledge that the skewness of the distribution is not symmetric. This asymmetry is primarily due to the presence of a long right tail in the distribution, which is a characteristic of asymptotic distribution measurements in statistical values. The negative kurtosis value also suggests that the statistical values do not follow an asymptotic distribution and exhibit a highly peaked distribution. Furthermore, it is important to note that the skewness values of the variables are positively skewed, except for the dependent variables. In contrast, the kurtosis values exhibit a negative direction, indicating that the distribution of these variables is not symmetrical. The confidence level of 95% implies that the majority of the variables exhibit a habitual spread in their distribution.

Test of Research Hypotheses

Hypothesis One: There is no significant impact between the remote accessibility and innovative efficiency of accountants in public tertiary institutions in Ondo State.

Table 3: The ANOVA Analysis of Hypothesis One

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	10.724	3	3.575	5.364	0.002
Within Groups	98.618	149	.666		
Total	109.342	152			

Source: Author's Computation (2023)



Table 3 presents the results of the ANOVA analysis conducted to assess the mean impact of the variables. The table also illustrates the ANOVA outcomes used to evaluate the significance of the variable, yielding an F-statistic of 5.364. The results further indicate a p-value of 0.002 for the variable, which is below the conventional threshold of 0.05. Therefore, since the p-value is less than the 0.05 significance level, it can be concluded that the null hypothesis which states that there is no significant impact between remote accessibility and innovative efficiency of accountants in public tertiary institutions in Ondo State is hereby accepted. This implies that, the majority of the accountants' sampled exhibit limited innovative skills, which in turn affects their efficiency in the field of accounting. The findings against the submission of Beredugo (2023) which supported the notion that cloud-based accounting education significantly contribute to the enhancement of operational efficiency of firms in Nigeria. However, when it comes to gauging the perceptions of respondents regarding the deployment of cloud accounting and its potential implications for corporate exigencies in Nigeria, the results reveal a notable absence of significant differences.

Hypothesis Two: There is no significant influence between collaborative learning and innovative efficiency of accountants in public tertiary institutions in Ondo State.

Table 4: The ANOVA Analysis of Hypothesis Two

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	22.729	3	7.576	12.946	0.000
Within Groups	86.613	149	.585		
Total	109.342	152			

Source: Author's Computation (2023)

Table 4 presents the ANOVA result conducted to assess the mean influence of the variables. The table also depicts the significant outcome with an F-statistic of 12.946 and a p-value 0.000. In this case, the p-value is less than the 0.05 significance level, indicating a significant relationship between collaborative learning and the innovative efficiency of accountants in public tertiary institutions in Ondo State. Consequently, the null hypothesis, which posited that there is no significant influence between collaborative learning and the innovative efficiency of accountants, is hereby accepted. This finding suggests that the flexibility of teaching through cloud-based methods indeed has an impact on the innovative efficiency of accountants. It is worth noting that the study by Osama (2018) aligns with these findings and draws insights from existing literature, emphasizing the crucial role of the cloud accounting concept and innovative efficiency in addressing the challenges and opportunities presented by cloud accounting education. This further underscores that there are other factors influencing the relationship between cloud-based accounting education and the innovative efficiency of accountants in Nigeria.

Hypothesis Three: There is no significant association between accounting skill development and innovative efficiency of accountants in public tertiary institutions in Ondo State.

Table 5: Analysis of Variance

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8.063	3	2.688	3.927	0.010
Within Groups	101.279	149	.684		
Total	109.342	152			

Source: Author's Computation (2023)

Table 5 presents the analysis of variance for hypothesis three, which examines the significance of the variable. The table reveals an F-statistic of 3.927 and a resulting p-value of 0.010. The p-value is less than the 0.05 level of significance, indicates that the variable is indeed statistically insignificant. Therefore, the null hypothesis, which suggested that there is no significant relationship between accounting skill development and the innovative efficiency of accountants in public tertiary institutions in Ondo State, is accepted. This finding contrasts with the conclusion drawn by Ezuwore-Obodoekwe, Okoye, and Obinabo (2020), who found a substantial impact of cloud computing on the Nigerian banking industry. This implies that skill development among accountants can be influenced by their individual beliefs and experiences. However, it is important to note that some graduate accountants may lack specific skills that hinder their ability to implement innovation effectively.



Conclusion

The study concluded that since there is no significant impact of remote accessibility on the innovative efficiency of accountants, it was concluded that the ability to access accounting resources and tools remotely did not necessarily translate into greater innovative efficiency among accountants in the sampled institutions. Similarly, there was no significant association between collaborative learning through cloud-based education and the innovative efficiency of accountants. This implies that the flexibility of teaching provided by cloud-based platforms did not have a substantial influence on accountants' innovative skills. However, some graduate accountants may still lack certain critical skills needed for effective innovation. The results indicate that while cloud-based accounting education offers various benefits, such as remote accessibility and collaborative learning opportunities, these factors alone may not significantly enhance the innovative efficiency of accountants. Skill development emerges as a more critical factor in driving innovation among accountants. The study contributes to understanding how cloud-based accounting education relates to innovative efficiency among accountants in public tertiary institutions. The results highlight the multifaceted nature of innovative efficiency and provide valuable insights for educators, policymakers, and practitioners in accounting.

Recommendations

Based on the study findings, the following recommendations were made:

1. Institutions should provide adequate training and support to students and lecturers to maximize the benefits of remote accessibility.
2. Institutions can collaborate with professional accounting bodies and industry experts to tailor these programs to meet current industry demands.
3. Public tertiary institutions should prioritize skill development programs to foster innovative efficiency among accountants. These programs should address specific skill gaps identified in the study.

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