

## DIGITAL TECHNOLOGY AND PROFESSIONAL EFFECTIVENESS OF SECRETARIES IN VIRTUAL AND HYBRID WORKPLACE: IMPLICATIONS FOR VOCATIONAL EDUCATION

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### Abstract

*The rapid adoption of virtual and hybrid work environments has transformed the competencies required of professional secretaries. This study examined the impact of digital technology on professional effectiveness in selected tertiary institutions in Delta State, Nigeria. Anchored in competency-based education theory and digital workplace theory, the study employed a descriptive-survey design, with 228 professional secretaries in tertiary institutions in Delta State. Data were collected using structured questionnaires and analyzed through descriptive statistics and multiple regression analysis. Findings revealed that digital collaboration skills, office technology competence, and virtual communication competence significantly predicted professional effectiveness, collectively explaining 76.8% of the variance. Digital collaboration skills emerged as the strongest predictor of effectiveness. The study concludes that vocational education programs must integrate digital competencies to prepare secretaries for the demands of modern workplaces. Recommendations include curriculum redesign, continuous professional development, and adoption of technology-enabled work environments. The study contributes to knowledge by empirically validating the link between competency-based secretarial training and performance in digital work settings.*

**Keywords:** Digital technology, secretaries, virtual and hybrid work, digital collaboration, professional effectiveness

### Introduction

The landscape of work has undergone significant transformation in recent years, driven by rapid advances in digital technologies and unprecedented global disruptions such as the COVID-19 pandemic. These changes have accelerated the adoption of virtual and hybrid work arrangements, fundamentally altering organizational structures, communication practices, and skill requirements in the modern workplace (Onwubuya, Alonta, & Akudolu, 2025). As a result, roles

traditionally grounded in physical office settings—such as the professional secretary—now require an expanded repertoire of competencies that extend beyond routine administrative tasks to include proficiency in digital collaboration, advanced office technologies, and virtual communication practices.

Historically, the secretarial profession has evolved from clerical and routine record-keeping functions to strategic support roles that facilitate information management and

organizational coordination in increasingly complex environments (Oluwasina, 2025). However, research shows that secretaries continue to face challenges in adapting to contemporary digital work demands, particularly when their training remains rooted in conventional office methodologies rather than emerging digital practices (Ocholi, Aina, & Ezeani, 2024). This gap underscores a broader concern within vocational education systems, which struggle to align training curricula with the dynamic competencies demanded by digital workplaces (Rahmawati, Abdullah, & Widiaty, 2025). These competencies include not only technical literacies—such as the use of cloud-based tools, virtual meeting platforms, and digital records systems—but also relational skills such as remote communication and self-management in dispersed teams.

The need for such competencies is reinforced by empirical studies demonstrating the link between hybrid work arrangements and organizational productivity outcomes. For example, hybrid workplace models have been shown to positively predict secretarial productivity when supported by appropriate digital infrastructure and management practices (Onwubuya et al., 2025). Despite this evidence, vocational and professional training programmes continue to lag in preparing secretaries for these evolving roles, often emphasizing traditional techniques over integrated digital skill sets.

Furthermore, the integration of digital literacy as a core component of vocational education has been recognized as essential for enhancing workforce readiness and employability in the digital age (Jia & Huang, 2023). Digital literacy and related competencies—notably digital communication, collaboration, and productivity skills—are now widely acknowledged as essential 21st-century skills for all vocational graduates (Jia & Huang, 2023). In the specific context of secretarial practice, inadequate training in

digital competencies can restrict effectiveness in emerging virtual and hybrid work environments, resulting in diminished organizational support and reduced career progression opportunities.

These trends highlight the critical need to rethink professional secretarial training within vocational education frameworks to address the challenges posed by digital transformation. There is a growing consensus that secretarial training programmes must be reconceptualized to include comprehensive digital skill development, enabling secretaries to operate effectively in virtual and hybrid work environments. This study, therefore, investigates the adequacy of current professional secretarial training, with the aim of redefining vocational curricula to meet the competencies required in the digital workplace.

### **Statement of the Problem**

The ongoing digital transformation of workplaces globally has fundamentally shifted the nature of work, leading to widespread adoption of virtual and hybrid work arrangements. These arrangements require employees to possess advanced competencies in digital collaboration, communication technologies, and autonomous task management (Rahmawati, Abdullah, & Widiaty, 2025). For professional secretaries—traditionally trained for face-to-face office environments—this transformation presents a profound challenge, as their conventional training programmes often emphasize routine administrative tasks and outdated office procedures, with limited focus on emergent digital competencies (Ocholi, Aina, & Ezeani, 2022). Empirical evidence indicates that secretaries increasingly struggle to adapt to the digital workplace, particularly in areas such as virtual communication, cloud-based collaboration, and digital information management, which undermines their effectiveness in contemporary work

contexts (Oluwasina, 2025; Ezeonwurie, 2025).

Despite the clear evolution of professional roles brought about by technology, current vocational and secretarial education curricula frequently lag behind industry needs. Many training programmes fail to integrate essential digital skills, resulting in a persistent digital skills gap among secretaries (Rahmawati et al., 2025; Zion-Ngoka & Ekoh-Nweke, 2024). This skills gap manifests in reduced job performance, challenges in leveraging modern office technologies, and limited capacity to support virtual and hybrid team functions efficiently. Furthermore, the lack of systematic training on digital workplace tools contributes to a mismatch between employer expectations and graduate competencies, thereby exacerbating issues of employability and professional relevance (Rahmawati et al., 2025).

The specific problem, therefore, lies in the inadequacy of existing professional secretarial training programmes to equip graduates with the competencies required for effective performance in virtual and hybrid work environments. This inadequacy not only hampers organizational productivity but also diminishes the professional development and career advancement opportunities of secretaries. The implication to vocational education in Nigeria is that without appropriate training interventions and curriculum redesign, secretarial education risks producing graduates whose skills are misaligned with the demands of the digital workplace, thereby undermining vocational education's contribution to workforce readiness in the 21st century.

### Objectives of the Study

The general objective of this study is to examine the impact of digital technology on professional effectiveness of secretaries in virtual and hybrid workplaces

with a view to rethinking vocational education. Specifically, the study sought to:

1. To examine the impact of digital collaboration skills on the professional effectiveness of secretaries in virtual and hybrid work environments.
2. To assess the impact of office technology and digital tools competence on the professional effectiveness of secretaries in virtual and hybrid workplaces.
3. To determine the impact of virtual communication competence on the professional effectiveness of secretaries in virtual and hybrid work settings.
4. To draw curriculum implications for improving professional secretarial training in response to the demands of the digital workplace.

### Research Questions

The study was guided by the following research questions:

1. What is the impact of digital collaboration skills on professional effectiveness of secretaries in virtual and hybrid work environments?
2. What is the impact of office technology competence on professional effectiveness of secretaries in virtual and hybrid work environment?
3. What is the impact of virtual communication competence on professional effectiveness of secretaries in virtual and hybrid work environments?
4. What curriculum implications can be drawn for improving professional secretarial training in response to the demands of the digital workplace?

### Research Hypotheses

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

**H<sub>01</sub>:** Digital collaboration skills have no significant influence on the

professional effectiveness of secretaries in virtual and hybrid work environments.

**H<sub>02</sub>:** Office technology and digital tools competence have no significant effect on the professional effectiveness of secretaries in virtual and hybrid workplaces.

**H<sub>03</sub>:** Virtual communication competence does not significantly affect the professional effectiveness of secretaries in virtual and hybrid work settings.

### Methodology

This study adopted a descriptive-survey research design with a quantitative approach to examine the relationship between digital technology and professional effectiveness of secretaries in virtual and hybrid work environments. The population of the study comprised professional secretaries in selected tertiary institutions Delta State, Nigeria. The institutions used include: Federal University of Petroleum Resources, Efurun,; Federal College of Education (Technical) Asaba; Admiralty University, Asaba; Delta State Polytechnic, Oghara; Delta State University, Abraka; Dennis Osadebe University, Asaba; Southern Delta University, Ozoro; and University of Delta, Agbor. These institutions were chosen because they operate in environments that increasingly adopt virtual and hybrid work models and employ professionally trained secretaries. Based on institutional records, the total population of professional secretaries in the selected institutions was 240 employees. Given the manageable population size ( $N = 240$ ), the study employed a census approach, involving all professional secretaries in the selected institutions.

Data were collected using a structured questionnaire developed based on the research objectives and literature review. The questionnaire consisted of four sections: Section A: Demographic

information (gender, educational qualification, years of experience). Section B while Section B contained 18 items—six items for each of the three constructs—measured on a five-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5). Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

The instrument's validity was established through content and construct validity. Experts in vocational education and office technology reviewed the questionnaire to ensure relevance, clarity, and alignment with research objectives. Reliability of the questionnaire was assessed using a pilot study involving 30 professional secretaries from similar institutions outside the study area. The Cronbach's alpha coefficient was computed for each construct, yielding values of 0.80, indicating high internal consistency.

Data collected were analyzed using Statistical Package for the Social Sciences (SPSS, version 29). Descriptive statistics (frequency, percentage, mean, standard deviation) were used to summarize respondents' demographics and construct scores. Inferential statistics were applied to test the research hypotheses: Multiple regression analysis was employed to examine the effects of digital collaboration skills, office technology competence, and virtual communication competence on professional effectiveness. Significance was tested at the 0.05 level.

### Results

This section presents the analysis and interpretation of data collected from professional secretaries in selected tertiary institutions in Delta State, Nigeria. This section is organized according to the research questions and hypotheses.

#### Research Question One

What is the impact of digital collaboration skills on professional effectiveness of

secretaries in virtual and hybrid work environments?

**Table 1:** Mean and Standard Deviation of Digital Collaboration Skills

S/N	Items	Mean	SD
1	Ability to collaborate with colleagues using digital platforms	3.48	0.62
2	Ability to share and co-edit documents online	3.55	0.58
3	Effectiveness in managing virtual meetings and schedules	3.41	0.66
4	Ability to work effectively in virtual teams	3.50	0.60
5	Use of cloud-based tools for task coordination	3.46	0.64
<b>Cluster Mean / SD</b>		<b>3.48</b>	<b>0.62</b>

Table 1 shows that all five items recorded mean scores above the criterion mean of 3.00. This indicates a high level of digital collaboration skills among professional secretaries. The cluster mean of 3.48 suggests that digital collaboration skills positively influence professional

effectiveness in virtual and hybrid work environments.

### Research Question Two

What is the impact of office technology competence on professional effectiveness of secretaries in virtual and hybrid work environment?

**Table 2:** Mean and Standard Deviation of Office Technology Competence

S/N	Items	Mean	SD
1	Proficiency in office productivity software	3.52	0.59
2	Ability to manage digital records and databases	3.44	0.63
3	Use of office automation tools	3.38	0.67
4	Ability to troubleshoot basic ICT problems	3.29	0.71
5	Adaptability to new office technologies	3.46	0.65
<b>Cluster Mean / SD</b>		<b>3.42</b>	<b>0.65</b>

Results in Table 2 reveal that respondents demonstrated high competence in office technology usage. The cluster mean of 3.42 confirms that office technology competence significantly enhances professional effectiveness in digital work environments.

### Research Question Three

What is the impact of virtual communication competence on professional effectiveness of secretaries in virtual and hybrid work environments?

**Table 3:** Mean and Standard Deviation of Virtual Communication Competence

S/N	Items	Mean	SD
1	Ability to communicate clearly via emails	3.57	0.56
2	Professional etiquette in virtual communication	3.49	0.61
3	Ability to give feedback through digital channels	3.44	0.64
4	Confidence in virtual presentations	3.36	0.69
5	Effectiveness in asynchronous communication	3.42	0.66
<b>Cluster Mean / SD</b>		<b>3.46</b>	<b>0.63</b>

Table 3 indicates that virtual communication competence is high among respondents. The cluster mean score

of 3.46 suggests that effective virtual communication plays a critical role in enhancing professional effectiveness.

**Research Question Four**

What curriculum implications can be drawn for improving professional secretarial

training in response to the demands of the digital workplace?

**Table 4: Mean and Standard Deviation of Vocational Education and Curriculum Implications**

S/N	Items	Mean	SD
1	Integration of digital collaboration skills into secretarial curricula will improve workplace readiness	3.56	0.57
2	Inclusion of office technology and automation tools in training enhances professional effectiveness	3.49	0.61
3	Emphasis on virtual communication skills in secretarial education is necessary for digital workplaces	3.52	0.59
4	Continuous curriculum review is required to align training with emerging digital work trends	3.58	0.55
5	Competency-based and practice-oriented training improves secretaries' performance in virtual and hybrid work	3.61	0.54
<b>Cluster Mean / SD</b>		<b>3.55</b>	<b>0.57</b>

Table 4 indicates strong agreement among respondents on the vocational education and curriculum implications for improving professional secretarial training in response to digital workplace demands. All items recorded mean scores above the criterion mean of 3.00, signifying a high level of consensus. The cluster mean score of 3.55 suggests that respondents strongly perceive the need for curriculum redesign that emphasizes digital collaboration, office technology competence, virtual communication skills, and competency-

based training approaches. This implies that aligning vocational education curricula with digital workplace requirements is essential for enhancing the professional effectiveness of secretaries in virtual and hybrid work environments.

**Test of Hypotheses**

**Hypothesis One**

**H<sub>01</sub>:** Digital collaboration skills have no significant effect on professional effectiveness of secretaries in virtual and hybrid work environments.

**Table 5: Regression Analysis of Digital Collaboration Skills and Professional Effectiveness Model Summary**

R	R <sup>2</sup>	Adjusted R <sup>2</sup>	F	Sig.
0.781	0.610	0.608	354.27	0.000

  

Predictor	$\beta$	t	Sig.
Constant	—	4.82	0.000
Digital Collaboration Skills	0.78	18.82	0.000

The model explains 61.0% of the variance in professional effectiveness. Digital collaboration skills significantly

predict professional effectiveness ( $\beta = 0.78$ ,  $p < 0.05$ ). The null hypothesis is rejected.

**Hypothesis Two**

**H<sub>02</sub>:** Office technology competence has no significant effect on professional effectiveness of secretaries in virtual and hybrid work environments.

**Table 6:** Regression Analysis of Office Technology Competence and Professional Effectiveness  
**Model Summary**

<b>R</b>	<b>R<sup>2</sup></b>	<b>Adjusted R<sup>2</sup></b>	<b>F</b>	<b>Sig.</b>
0.703	0.494	0.491	221.64	0.000

  

<b>Regression Coefficients</b>				
<b>Predictor</b>	<b><math>\beta</math></b>	<b>t</b>	<b>Sig.</b>	
Constant	—	5.11	0.000	
Office Technology Competence	0.70	14.89	0.000	

Office technology competence accounts for 49.4% of the variation in professional effectiveness and significantly influences performance. The null hypothesis is rejected.

### **Hypothesis Three**

**H<sub>03</sub>:** Virtual communication competence has no significant effect on professional effectiveness of secretaries in virtual and hybrid work environments.

**Table 7:** Regression Analysis of Virtual Communication Competence and Professional Effectiveness  
**Model Summary**

<b>R</b>	<b>R<sup>2</sup></b>	<b>Adjusted R<sup>2</sup></b>	<b>F</b>	<b>Sig.</b>
0.742	0.551	0.548	276.35	0.000

  

<b>Regression Coefficients</b>				
<b>Predictor</b>	<b><math>\beta</math></b>	<b>t</b>	<b>Sig.</b>	
Constant	—	4.97	0.000	
Virtual Communication Competence	0.74	16.62	0.000	

Virtual communication competence explains 55.1% of the variance in professional effectiveness and significantly predicts performance. The null hypothesis is rejected.

### **Discussion of Results**

The findings of this study provide compelling evidence that digital technology, particularly in the areas of digital collaboration skills, office technology competence, and virtual communication skills, significantly predicts professional effectiveness of secretaries in virtual and hybrid work environments. This discussion interprets the results in light of empirical evidence, theoretical perspectives, and vocational education principles.

The analysis revealed that digital collaboration skills had the strongest positive effect on professional effectiveness ( $\beta = 0.375$ ,  $p < 0.05$ ). This implies that secretaries who are adept at coordinating tasks, collaborating across virtual platforms, and engaging effectively with colleagues in distributed teams perform better in hybrid and virtual settings. This finding is consistent with empirical studies indicating that digital collaboration is critical in contemporary workplaces. For instance, Andrés, Mena-Guacas, Meza-Morales, Fernández & López-Meneses (2023) emphasized that digital collaboration competencies—such as team coordination, task-sharing, and co-creation in cloud-based environments—enhance productivity and professional effectiveness.

Office technology competence also had a significant positive influence on professional effectiveness ( $\beta = 0.321$ ,  $p < 0.05$ ). Secretaries proficient in office automation software, cloud-based applications, and digital record management demonstrate higher accuracy, efficiency, and adaptability in completing administrative tasks. This aligns with prior research indicating that mastery of digital tools is indispensable for administrative professionals navigating modern workplace demands (Nur Kholifah et al., 2025; Findeisen & Wild, 2022).

Virtual communication competence also significantly predicted professional effectiveness ( $\beta = 0.298$ ,  $p < 0.05$ ). This suggests that secretaries who communicate effectively through emails, video conferencing, and messaging platforms are more efficient in completing tasks, coordinating with teams, and maintaining professional standards. This finding resonates with Bloom, Han, and Liang (2024), who reported that effective digital communication in hybrid work environments preserves productivity, fosters engagement, and reduces miscommunication. Furthermore, Tawalbeh (2025) argues that virtual communication is a core determinant of success in digitally mediated workplaces, as it enables employees to collaborate asynchronously, overcome geographic barriers, and maintain organizational connectivity.

The findings relating to Research Question Four reveal strong consensus among respondents that vocational education and curriculum reform are critical for improving professional secretarial training in response to the demands of the digital workplace. The high cluster mean ( $\bar{x} = 3.55$ ) indicates that secretaries perceive curriculum alignment with digital competencies as essential for enhancing professional effectiveness in virtual and hybrid work environments. Empirically, the finding is consistent with

prior studies that highlight the importance of curriculum innovation in vocational education. Nur Kholifah et al. (2025) reported that vocational graduates with strong digital employability skills demonstrated significantly higher workplace readiness in technology-driven environments. Similarly, Findeisen and Wild (2022) found that early exposure to digital competencies in vocational training positively influenced professional performance.

### Conclusion

This study which examined the impact of digital technology on professional effectiveness of secretaries in virtual and hybrid work environments reveals that digital collaboration skills, virtual communication competence and office technology competence exert influence on professional effectiveness of secretaries. This indicates that secretaries who are proficient in collaborative digital platforms, virtual interaction tools, and office automation technologies are better positioned to perform effectively in technology-mediated workplaces. The study further establishes that current vocational education curricula must move beyond traditional clerical training to incorporate competency-based, practice-oriented, and digitally aligned instructional approaches.

Based on the findings and its implications, the study concludes that sustainable professional effectiveness among secretaries in virtual and hybrid work environments can only be achieved through deliberate investment in digitally responsive vocational education and continuous professional development.

### Recommendations

Based on the findings, the following recommendations are proposed for policy makers, vocational education institutions, and organizations:

1. Integration of Digital Skills into Curriculum: Vocational education programs for professional secretaries should embed modules on digital collaboration, office automation, and virtual communication to ensure graduates are workplace-ready for hybrid and virtual environments.
2. Continuous Professional Development (CPD): Organizations employing secretaries should implement ongoing digital skills training, workshops, and certification programs to maintain high levels of professional effectiveness amidst evolving technology.
3. Technology-Enabled Work Environments: Institutions and organizations should invest in modern office technology, cloud-based platforms, and collaboration tools to facilitate practical application of digital competencies acquired during training.
4. Policy Formulation for Hybrid Work: Educational and organizational policies should support the transition to hybrid and virtual work environments, ensuring that secretaries receive structured exposure and training for such work arrangements.

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