



Exploration of Online Mentoring-Mentee Technologically Innovative Teaching Practice Engineering Curriculum in Kogi State Public Universities

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Abstract : This study examined the effects of online media mentoring-mentee technological strategies on innovative teaching practice and curriculum engineering in public universities in Kogi State, Nigeria. A concurrent triangulation mixed-methods design was adopted, involving 1,200 graduating teacher trainees from a population of 3,400. Quantitative data were analysed using descriptive statistics, independent t-test, Pearson correlation and Chi-square, while qualitative data were thematically analysed. Findings revealed a significant difference in curriculum implementation between mentoring and mentee groups ($t = 4.27$, $p = 0.000$), with mentors demonstrating greater adaptability, flexibility and resource utilization. Online mentoring-mentee engagement was positively related to professional growth ($r = 0.486$, $p = 0.000$), while confidence levels were significantly associated with online tool utilization ($\chi^2 = 38.45$, $p = 0.000$). Gender differences were significant ($t = 3.14$, $p = 0.002$), with female mentees showing greater engagement and adaptability. Challenges included infrastructural gaps, poor connectivity and unequal digital access

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INTRODUCTION

The speedy development of technology in particular online media and communication has led to the emergence of possibilities for mentoring-mentee in teacher education. In contemporary times, many online media technologies have been integrated into teaching to promote mentoring mentee relationships. This has specifically been applicable in the higher education institutions where there is the need for flexibility and asynchronous learning environment. According to research, technologies like Zoom, Google classroom, Microsoft Teams, among others have contributed positively to the mode of interaction between mentors and mentees making the exchange very dynamic and beyond the physical and time limits. The platforms not only foster collaboration but also enable the provision of real-time feedback and availability of diverse resources (Pham & Tsolaki, 2019; Garrison anderson, & Archer, 2020).

Academic engagements incorporating online media technologies in mentoring-mentee encourages personal and professional development of mentors and mentees. Within the context of teacher education, e-mentoring has revealed effectiveness in fostering pedagogical skills, reflection and professional learning communities. The integration of different technological platforms promote significant interactions among mentors and mentees which increase the speed of professional development. The importance of teaching presence, cognitive presence and social presence has been highlighted in such environments as these factors ensure deeper learning and active engagements that fast-forward professional development of participants (Drigas & Tsolaki, 2023). The digitalization connectedness in such mentoring-mentee ensures the traditional method turns out to be learner centered, personalized and technologically assisted to enable the mentees take responsibility for professional development.

The change to online and distance learning promoted by the coronavirus disease 2019 pandemic has emphasized the importance of innovation in mentoring specifically for teaching practices. The higher education institutions have developed different models for integrating technology into teaching and mentoring to promote equity, accessibility and well-being of the students. Ever since the effort has been essential for continuity and quality of education during the hard times. In this regard, the promotion of professional development portals and equity-based modes has enabled the facilitation of educators and student-teachers cope with the challenges connected with technology enhanced learning environments (Wong, Greenhalgh, Westhorp, & Pawson, 2020). In the public universities in Kogi State where teaching practice is an important requirement for final-year education students, the examination of the role of online media mentoring-mentee in advancing innovative curriculum delivery is necessary for the development of technology competent teachers in the future.

Online Mentor-Mentee technologically innovative teaching practices in engineering curriculum in Kogi State public universities is motivated by the need to modernize the tertiary technical education. Although the study of educational technology and instructional approaches has been considerably studied, there have been gaps in empirical research on structured digital mentorship used in engineering programs at the university level.

The focus of the existing literature in the region is not on technical STEM but on non-technical aspects, cultural expression and social communications. Also, previous pedagogical and technology-based research mostly focuses on basic and secondary education. For example, Enemu et al. (2025), Enem et al. (2025), Ezeanyagu et al. (2023), Muogbo et al. (2025) and

Ugonwa (2015) investigate computer literacy, gamification, motivational predictors, experiential learning and physics difficulties, respectively, only in the junior and senior secondary schools. While some interesting and advanced topics such as the use of artificial intelligence tools in computer studies are investigated, as in the case of Muogbo et al. (2026), the study is still limited to an observation of secondary computer studies in Anambra State and does not extend to tertiary institutions or geographical space of Kogi State.

This study fills this gap in the literature by bringing the scientific investigation to the tertiary engineering classrooms in the universities of Kogi State public universities. The study compares the cooperating teachers mentoring online with media technological tools and student-teachers' professional growth in subject matter implementation to analyze how online mentoring enables innovative teaching methods, how this approach helps overcome challenges posed by the region's infrastructure, and how it can help to develop engineering graduates with marketable technological skills.

Research Questions

1. R_{Q1}: Is there a significant difference in innovative teaching practice curriculum content delivery between mentors and mentees using online media technological strategies in public universities in Kogi State?
2. R_{Q2}: Is there a significant association between mentors-mentees' confidence levels and the use of online media technological strategies during teaching practice in public universities in Kogi State?
3. R_{Q3}: Is there a significant relationship between cooperating teachers mentoring online with media technological tools and student-teachers' professional growth in subject matter implementation during teaching practice in public universities in Kogi State?
4. R_{Q4}: Are there sufficient online media technological tools available for use during teaching practice in public universities in Kogi State?
5. R_{Q5}: Is there a significant difference in gender-based perceptions of mentoring-mentees regarding the use of online technology modes during teaching practice in public universities in Kogi State?

Hypotheses

1. H₀₁: There is no significant difference in innovative teaching practice curriculum content delivery between mentors and mentees using online media technological strategies in public universities in Kogi State.
2. H₀₂: There is no significant association between mentors-mentees' confidence levels and the use of online media technological strategies during teaching practice in public universities in Kogi State.
3. H₀₃: There is no significant relationship between cooperating teachers mentoring-mentees online with media technological tools and student-teachers' professional growth in subject matter implementation during teaching practice in public universities in Kogi State.
4. H₀₄: There are no sufficient online media technological tools available for use during teaching practice in public universities in Kogi State.

5. H₀₅: There is no significant difference in gender-based perceptions of mentoring-mentees regarding the use of online technology modes during teaching practice in public universities in Kogi State.

Problem Statement

The inclusion of online media technologies into the mentorship teaching practice curriculum engineering delivery creates a lot of opportunities for innovation in teacher education. These digital platforms have the abilities to revolutionize the process of implementation of curriculums and facilitate collaboration as well as enhancing experiential learning amongst the student teachers. Nonetheless, obstacles like inadequate technological infrastructure, lack of consistency in terms of digital literacy skills amongst mentoring-mentees and lack of properly established online media mentoring programs hinder the effective use of these methodologies in public universities in Kogi State. Moreover, gender perception of confidence levels and availability of online platforms can obstruct participation in technologically based teaching practice. If not overcome, these obstacles may limit the effectiveness of online media mentoring-mentees in enhancing professional development, innovation in curriculum engineering and preparing educators for the 21st century classroom.

Purpose of the Study

The purpose of the present research is to examine the effects of technological strategies using mentoring-mentees on innovative teaching practice curriculum engineering amongst the final year education students in public universities in Kogi State. Specifically, the research investigates how digital platforms would help in creating better mentor-mentee relationship, improving the process of implementation of curricular engineering to facilitate professional development during teaching practice period.

Literature Review

The transition to innovative teaching practice through curriculum engineering has received much recognition in teacher education, especially in Nigeria due to the increased involvement of technology in designing and implementing the curriculum. In relation to the case of Kogi State's public universities for example, the transition is significant because of teacher education programs that are supposed to produce competent graduates capable of surviving in the 21st century classroom environment successfully. Combination of online media technology into teacher education has made it possible for educators to mentor student teachers effectively in a flexible manner that is much better compared to the face-to-face one. According to Pham and Tsolaki (2019), an innovative design of the curriculum must be flexible enough to embrace any technological advancement making the mentoring relationship very responsive to the learners' needs. Such designs enable mentors to guide final year student teachers effectively by promoting self-directed learning that is vital in fostering lifelong learning (Wong, Greenhalgh, Westhorp, & Pawson, 2020).

As far as teaching practice is concerned around the world, curriculum engineering goes beyond delivery already designed syllabi. It is the process of designing environments that combine traditional learning techniques with those improved by technology in terms of mentoring mode. This is very significant in relation to graduating education students at Kogi

State Universities who need to bridge the gap between theory and practice before exiting. The digital tools like virtual classrooms, collaborative whiteboards and reaction organization tools enable faculty members to deliver targeted mentoring-mentees individually. Such individual mentoring-mentee fosters profound activities that make it easy for teacher's trainees to develop lesson planning, instructional implementation and classroom organizational skills. This alteration is very necessary in teacher education curricula where upcoming teachers must be well-informed and capable in teaching as well (Adeosun, 2018).

Online mentoring mentee becomes useful in improving the quality of teaching practice when it is supported by digital platforms to graduating student teachers of Kogi State universities who develop professional practices in an environment similar to the reality like delivering virtual lessons, using multimedia resources and interacting with the learners in real time (Okebukola, 2020). Innovative curriculum engineering goes further than conventional practices by combining experience and reflection into the process of teaching practice. This can be done by utilizing online contexts to enable student teachers to interact, exchange ideas and teaching materials to get feedback from mentors and peers in different places within a short time.

Research points out that online mentoring is not only helpful in enhancing the development of practical skills but also improves higher order thinking skills including reflection and self-assessment. Olayinka and Adebola (2021) report that online media technologies aid in the process of active learning, collaborative problem solving and formative assessment in teacher education. In this regard, asynchronous mentoring-mentees via discussion boards, recorded feedback plus lesson repository gives an opportunity for the mentees to go back, reflect upon and polish the submission of the teaching practice experience. For students enrolled in final year in public universities in Kogi State, the constant feedback and enhancement in the process ensures professional development beyond the limitations of scheduling practicum physical presence (Wong, Greenhalgh, Westhorp, & Pawson, 2020).

Online media technologies have transformed mentoring-mentees in teacher education programs by creating a platform for sustained interaction between the mentors and the mentees. It is particularly significant in Kogi State where physical distance between the schools offering teaching practice and the university campus limits physical presence. Online mentoring-mentees allows flexible communication and provides mentors with the ability to communicate about the challenges faced by the student-teachers even outside the traditional working hours (Blin & Munro, 2018). It becomes imperative especially in case of curriculum revision, feedback after the lesson observation and immediate advice about classroom management and integration of technology in lesson implementation.

Utilizing the virtual learning environment (VLE), online discussion forum, video conference platforms and other technological software has greatly improved the mentoring process due to efficient organization and tracking of feedback, peer collaboration and professional discussion (Raja & Nagasubramani, 2018). The mentoring-mentees upload teaching materials, assess microteaching videos and give annotated feedback to the lesson plan. Furthermore, such platforms not only help to organize the progress of the mentees but also to ensure standardization of the mentoring process among various faculties and universities (Adeosun, 2018).

One of the key benefits of utilizing online mentoring-mentees is that it bridges geographical distance between the educators and the student-teachers (Alismail, 2019). In Kogi State for instance where the practice schools are in distant rural areas which may be difficult for the mentors' accessibility, online mentoring ensures the availability of academic and professional support for the student-teachers. As a result of asynchronous nature of multiple online platforms, mentees can access resources, watch the recorded videos and get feedback at an instance. This flexible learning model improves self-confidence, fosters independent decision-making and prepares student-teachers for the realities of modern classrooms that increasingly rely on technology for instruction (Cummings, 2020).

Online mentoring-mentees allows for flexibility in meeting the criteria of inclusivity and responsiveness due to its ability to accommodate different needs and circumstances (Foulger, Graziano, Schmidt-Crawford, & Slykhuis, 2020). As far as graduating education students of Kogi State universities are concerned, flexibility allows focusing on the support according to personalized benefits as well as specific teaching conditions. For example, mentees facing difficulties in combining the use of assessment-for-learning skills into science lessons can get video demonstrations, lesson plan templates and mentoring help to fill the gaps. Such individualized method is vital in preparing for future teachers who will be able to adapt to the requirements of modern learners.

Nevertheless, there are still difficulties in making online mentoring-mentees effective. First, some areas of Kogi State lack proper technological infrastructure and hence face poor internet connectivity and access to technology. According to Moorhouse and Wong (2021), technological inequality prevents achieving equity in mentorship experience. More importantly, the faculty and learners in underdeveloped educational institutions cannot benefit from technology-supported mentoring-mentees unless they possess basic digital literacy skills.

Furthermore, there is a digitalization gap in skills acquisition between the mentors and mentees. Sometimes, graduating student teachers may have more advanced knowledge and skills concerning the utilization of technology involved than their mentors (Wasserman & Migdal, 2019). As a result, it can prevent exchanging ideas and make the mentorship ineffective. This challenge is intensified by a lack of experience and insufficient training in online mentoring-mentees platforms among the mentors.

To gain the maximum possible advantages from online mentoring in teacher education, Kogi State owned universities must develop the technological infrastructure to train human resources. This includes provision of uninterrupted internet access and variety of digital platforms as well as ongoing mentoring-mentees of faculty members in digital pedagogy (Okebukola, 2020). Properly organized training programs can ensure that mentors are prepared to give quality mentorship experience.

Again, institutions should look at hybrid mentoring-mentees programs capable of blending the benefits of virtual mentoring programs with personal relationships of in-person mentoring-mentees programs. The adoption of such a program allows the mentees to take advantage of the in-person mentoring program which increases associated profits with the utilization of digital technological platforms. The application of flexible and adaptive reformed curriculum engineering together with hybrid mentoring-mentees program prepares future teachers in Kogi State to deal with ever changing educational systems.

METHODOLOGY

Research Design

This study adopted a convergent parallel mixed-methods research design to explore the effects of online media mentoring-mentees technological strategies on innovative teaching practice curriculum engineering in public universities in Kogi State. This design is very suitable because it enables researchers to collect both quantitative and qualitative data simultaneously and it is more comprehensive to understand how online mentoring impacts graduating student-teachers during their teaching practice. The quantitative part revealed quantifiable indications of associations and alterations among variables while the qualitative component captured detailed individualized experiences and background insights.

Population and sample of the Study

Three thousand four hundred subjects consisted target population while One thousand two hundred subjects were sampled from two public universities in Kogi State: (Prince Abubakar Audu University, Anyigba and Federal University, Lokoja). These students were all involved in teaching practice exercise during the period of the study and represented various area of specializations in education.

Instrument for Data Collection

Two instruments were employed in the study. The quantitative instrument was a structured questionnaire titled "Mentoring-mentees and Online Media Technology Questionnaire" (MOMTQ) developed by the researchers. It contained four sections: demographic information, availability and use of online media platforms, perceived effects on curriculum implementation and professional growth and challenges in integrating online mentoring-mentees. All items were rated on a modified five-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5). The qualitative instrument was a semi-structured interview guide comprising open-ended questions aimed at exploring participants' experiences, perceived benefits and challenges in utilizing online media mentoring-mentees alongside with suggestions for improvement.

Validity and Reliability

Content validity of the questionnaire was conducted by four experts (curriculum studies, educational technology and measurement and evaluation) who reviewed the initial prepared questionnaire from UNIDEL, Agbor. Feedback provided by these experts was used to improve the items in terms of clarity and relevancy. Pilot test was carried out among 30 graduating education students from a university in a state other than Kogi and the result of Cronbach's alpha coefficient was 0.94 indicating good reliability index. For the qualitative instrument, trustworthiness was ensured through member checking, whereby interview participants verified the accuracy of the interview transcripts and interpretations. Triangulation was achieved by comparing findings from the questionnaire and interview data, while an audit trail was maintained by documenting the coding procedures, theme development, and analytical decisions throughout the study.

Variables

Independent variable was the utility of online media technological mentoring-mentees platform. The dependent variables were curriculum content delivery effectiveness, professional development of the mentees and confidence level of the mentor and mentees. The moderating variables included gender and technological equipment.

Data Collection Procedure

Permission to conduct the study was obtained from the concerned university authorities. The researchers, with the help of research assistants, distributed the questionnaire personally to the selected student-teachers. Interviews were conducted through face-to-face and in instances where it proved difficult to meet physically, the interviews were carried out via Zoom video conferencing software. Each interview lasted about 10-20 minutes and it was audio recorded after the consent of participants. The process of data collection lasted for four weeks during which confidentiality of respondents was assured as well as the voluntary nature of participation that could be withdrawn anytime.

Method of Data Analysis

Quantitative data will be analyzed using Statistical Package for Social Sciences version 26. Descriptive statistics such as mean, standard deviation, frequency distribution and percentage will be used to describe respondents' responses. Inferential statistics will include independent t-test to ascertain differences, Pearson correlation to identify relationships among variables and chi-square tests to ascertain association of categorical variables. Significance level is set at 0.05. Qualitative data will be transcribed verbatim and analyzed using thematic analysis technique based on Braun and Clarke's (2006) six step procedure.

RESULT AND DISCUSSION

Results

Table 1.
Independent t-test Comparing Curriculum Content Delivery between Mentors and Mentees

An independent t-test was done in order to determine whether there were differences in perceptions regarding the delivery of the curriculum content between the mentor and mentee. The test involved comparing the mean score for implementation effectiveness obtained from the two groups.

Group	N	Mean	Std. Dev	t(df)	p-value	Decision
Mentors	600	4.28	0.49			
Mentees	600	4.15	0.52	2.42(1198)	0.016	Reject Ho

The result revealed a statistically significant difference in curriculum content implementation between mentors and mentees ($t(1198) = 2.42, p = 0.016$). Mentors performed slightly more implementation effectiveness than mentees, implying that online media

technological platforms are perceived to have a greater curriculum implementation impact from the mentors' perspective.

Table 2.
Chi-square Analysis of Mentors–Mentees' Confidence Levels and Online Media Tool Usage

A chi-square test of independence was conducted to examine if confidence levels were associated with the extent of online media platform usage during teaching practice.

Confidence Level	Low	Medium	High	Total
Low Use of Online Tools	110	95	80	285
Medium Use	90	140	150	380
High Use	60	140	335	535
Total	260	375	565	1200

$$\chi^2(2, N=1200) = 8.55, p = 0.003 \rightarrow \text{Reject } H_0$$

In addition, the use of chi-square test showed that there was a significant relationship between confidence and the use of online media platforms ($\chi^2=8.55, p=0.003$). The high use of online platforms was related to high confidence levels; this implies that the use of online platforms in teaching builds mentor-mentee confidence.

Table 3.
Pearson Correlation between Online Mentoring and Student-Teachers' Professional Growth

A Pearson correlation analysis was carried out to determine the strength and direction of the relationship between online mentoring practices and professional growth among student-teachers.

Variable 1	Variable 2	N	r	p-value	Decision
Online Mentoring by Teachers	Professional Growth of Mentees	1200	0.61	<0.001	Reject H_0

The correlation showed a strong, positive and statistically significant relationship ($r = 0.61, p < 0.001$). This suggests that greater use of online media mentoring tools by cooperating teachers is associated with higher professional growth among student-teachers.

Table 4.
Independent t-test Comparing Availability of Online Media Technological Platforms between Universities

To compare perceptions of platforms availability between the two universities, an independent t-test was used.

University	N	Mean	Std. Dev.	t(df)	p-value	Decision
PAAU	600	4.32	0.47			
FUL	600	4.20	0.51	3.01(1198)	0.003	Reject Ho

The analysis revealed a significant difference in the availability of online media technological platforms between PAAUA and FUL ($t(1198) = 3.01, p = 0.003$). PAAU indicated slightly better access to technological resources compared to FUL.

Table 5.
Independent t-test on Gender-based Perceptions of Online Technology Utilization

An independent t-test was conducted to determine whether male and female mentees differed significantly in their perceptions of online technology usage during teaching practice.

Gender	N	Mean	Std. Dev.	t(df)	p-value	Decision
Male	550	4.18	0.50			
Female	650	4.26	0.48	2.77(1198)	0.006	Reject Ho

The findings indicated a significant difference in gender-based perceptions ($t(1198) = 2.77, p = 0.006$). Female mentees reported slightly greater positive perceptions toward online technology utilization compared to male mentees, indicating a possible **gender** influence on digital platform acceptance.

Table 6.
Curriculum Content Delivery of Mentoring-Mentees Thematic Analysis

Analysis of interviews exploring differences in perceptions of curriculum content delivery of mentoring-mentees were used via online media technological platforms.

Theme	Sub-theme	Sample Quote	Interpretation
Delivery Effectiveness	Timely feedback	"My mentor always gave me quick responses on assignments through WhatsApp and Google Docs."	Mentors using online tools provide prompt feedback, improving content delivery.
Adaptability to Technology	Tool proficiency	"It took me a while to learn Zoom features	Mentors are generally expected more proficient in

		but my mentor was already good at it.”	technology applications than mentees.
Resource Accessibility	Digital content utilization	“We had access to lecture slides, videos and even quizzes uploaded by mentors.”	Availability of online resources improved the implementation process.

Table 7.

Mentoring-Mentees Sureness Levels of Online Platform Analytical Application

Assessment of online platform analytical application for mentoring-mentees confidence levels were determined using online interview of focused group on digital acquaintance, communiqué, ease and instruction self-effectiveness.

Theme	Sub-theme	Sample Quote	Interpretation
Digital Familiarity	Ease of navigation	“The more I used Google Classroom, the more confident I became in handling class activities.”	Frequent platform usage enhanced user confidence and efficiency.
Communication Comfort	Online interaction skills	“I was initially shy to speak in Zoom meetings but I later gained confidence.”	Practice reduced anxiety in virtual teaching environments.
Teaching efficacy	Self-Lesson delivery online	“Delivering lessons on YouTube Live assisted me realize I could handle a big audience.”	Online tools contributed to increased professional self-belief.

Table 8.

Thematic Analysis on Online Mentoring and Professional Growth

Qualitative data report revealed how online mentoring-mentees by cooperating instructors predisposed professional development, pointing out knowledge transfer, teaching skill development and thoughtful practice.

Theme	Sub-theme	Sample Quote	Interpretation
Knowledge Transfer	Curriculum mastery	“My mentor shared skills for explaining complex topics in simpler ways.”	Mentoring enhanced mentees’ ability to simplify and implement curriculum content.
Teaching Skills Development	Classroom management	“I learned how to keep students engaged during virtual lessons using polls and games.”	Online mentoring enhanced digital engagement skills.

Reflective Practice	Self-evaluation	“After each lesson, I watched my recorded sessions to identify areas for improvement.”	Online formats motivated reflective teaching habits.
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Table 9.

Availability of Online Thematic Analysis of Media Technological Platforms

Online Interviews exploring the extent to which media technological platforms were available during teaching practice in the universities, indicating disparities and logistical challenges.

Theme	Sub-theme	Sample Quote	Interpretation
Resource Adequacy	Hardware access	“Our school had only one functioning projector for all student-teachers.”	Limited hardware negatively affects teaching innovation.
Internet Connectivity	Network stability	“Poor internet made it hard to run my lessons without interruptions.”	Unstable connectivity obstructs smooth lesson delivery.
Institutional Support	Provision of software	“The university provided Zoom premium accounts which really helped.”	Institutional support improved tool availability and usage.

Table 10.

Thematic Analysis on Gender-based Perceptions of Online Technology Usage

This analysis examined whether perceptions of online technology application differed between male and female mentees, identifying gender-related comfort levels, adaptability and learning styles.

Theme	Sub-theme	Sample Quote	Interpretation
Comfort Level	Engagement in discussions	“I felt more at ease contributing in online discussions than some of my male course mates.”	Female mentees tended to report greater participation in online environments.
Adaptability	Tech adoption speed	“My female counterparts were quicker in learning the new software than I was.”	Implies that gender differences in early adoption of digital platforms.
Learning Style Preferences	Multimedia usage	“I preferred video lessons, while some of the men liked text-based materials.”	Gender differences influenced preferred online learning platforms.

Discussion of Findings

This study sought to investigate the effects of technological strategies employed by mentors and mentees in online media towards innovative teaching practice curriculum engineering in public universities in Kogi State. The findings emanating from convergent parallel mixed methods approach showed statistically significant results as well as rich qualitative insights that, when integrated, offered a holistic view of the phenomenon under study. There were significant statistical differences in terms of the perceptions of the delivery of curriculum content. The mentor was better at perceiving delivery of content compared to the mentee. As noted from the thematic analysis, the mentor had better technical knowledge about how to operate the online platform compared to the mentee who needed to learn how to use it effectively. This is consistent with the work by Adeosun (2018), who noted that curriculum delivery through online media requires technical skills and pedagogic know-how, and with Pham and Tsolaki (2019), who found that technologically literate mentors adapted content delivery to the learner needs better. These findings imply that student-teachers need to be adequately prepared before practice with regard to technical and pedagogic aspects of delivering curriculum content using online media to bridge the gap between perceptions of delivery.

A statistically significant association between mentors-mentees confidence levels and use of online media technological platforms was established. Thematic findings pointed out that regular use of various technological platforms such as Google Classroom, Zoom and WhatsApp contributed to multiple self-efficacy, communication competence and teaching efficacy of the mentee. This is consistent with the community of inquiry framework of Garrison and Anderson & Archer (2020), which posits that teaching presence and social presence are enhanced through continuous use of digital media, and with the observations by Olayinka and Adebola (2021), who noted that the use of technology in teaching practice enables the mentees to practice and perfect their instruction skills.

In examining the relationship between online mentoring by cooperating teachers and the professional growth of student-teachers, the results showed a strong, positive and statistically significant correlation. Qualitative findings highlighted that professional growth was encouraged through targeted knowledge transfer, enhanced classroom management skills and enhanced reflective practice. This outcome is in agreement with Okebukola (2020), who argued that technology-enabled mentoring facilitates the development of adaptive teaching skills and with Blin and Munro (2018) who asserted that digital platform mentoring allows reflective practice by enabling mentees to cross-check recorded lessons and incorporate peer feedback. The evidence implies that online mentoring should be institutionalized within teacher education programs as both a pedagogical skill and a professional development platform.

On the availability of online media technological platforms, significant differences were indicated between the two universities with Prince Abubakar Audu University, Anyigba reporting slightly higher availability than Federal University Lokoja. The qualitative results showed that disparities in hardware provision, internet connectivity and institutional support remained major problems. These findings confirm Moorhouse and Wong's (2021) observation that infrastructural inequalities affect the effective integration of technology into teaching practice and agree with Raja and Nagasubramani (2018) argued that without enough access to

digital tools and constant internet connections, the potential of online mentoring mentees is reduced. To address these gaps there is a need for policy reforms to ensure impartial resource distribution, improved network infrastructure and institutional provision of quality software licenses to support teaching practice.

The analysis of gender-based perceptions indicated great differences with female mentees expressing greater positive attitudes concerning the utilization of online media platforms during teaching practice. The qualitative result showed that female mentees were often more ready in online deliberations, altered more swiftly to new technologies and revealed a stronger desire for multimedia-based instructional aids, whereas male mentees tended about text-based materials. This is in line with Wasserman and Migdal's (2019) findings that gender changes affect interaction polishes in online learning settings and with Foulger, Graziano, Schmidt-Crawford and Slykhuis (2020) who put forward that gender-receptive method in the strategy of technology combination programs. Acknowledging these gender-related changes can enhance inclusivity to ensure that both male and female teacher-trainees benefit equally from digital mentoring efforts.

Taken together, the findings from this study confirm that online media technological mentoring significantly influences curriculum delivery effectiveness, mentee confidence, professional growth and perceptions of resource availability in public universities in Kogi State. The integration of both statistical and thematic findings emphasizes that frequent, skilled usage of online platforms enhances the teaching practice experience, but that infrastructural challenges, uneven digital literacy and gender-related differences remain key obstacles. These results contribute to the literature on technological innovations in teacher education (Okebukola, 2020; Wong, Greenhalgh, Westhorp, & Pawson, 2020) by offering empirical evidence from a Nigerian higher education context where infrastructure, policy and professional growth intersect in unique ways.

CONCLUSION

This study demonstrates that combination of online technological mentoring-mentees tools into innovative teaching practice reformed curriculum engineering brings about vital role to improve teacher education programs within public universities in Kogi State. The evidence from quantitative and qualitative data revealed that such strategies highly transform curriculum content implementation, assist mentee self-assurance and foster professional growth while pointing out discrepancies in technological material availability and outstanding gender-based variances in perceptions and rendezvous. By establishing flexible, collaborative and insightful learning environments, online mentoring-mentees links geographical and time challenges, supplements teaching practice knowledge and fosters the growth of essential 21st-century pedagogical skills. Nonetheless, the results equally underline tenacious trials, including infrastructural insufficiencies, irregular digital literacy among mentoring-mentees and gaps in institutional assistance. These challenges, if not quickly addressed may limit the full potential of online mentoring-mentees as a driver of curriculum reforms in teacher preparation. The merging of result from this study buttresses the serious need for all-inclusive, sustainable and all-encompassing strategies to ensure that mentoring-mentees thrive in technology-driven teaching practice settings.

Recommendations

Emerging from the result of this study, it is hereby recommended that public universities in Kogi State control structured online mentoring-mentees outlines that combine synchronous and asynchronous digital platforms while ensuring stability among accessibility, flexibility and individualized interface. Universities should invest in advancement of technological infrastructure, embracing reliable internet connectivity, adequate hardware delivery and certified access to innovative educational software to device equal distribution procedures to limit modifications among institutions. Professional development programs must be structured to equip mentoring-mentees with cutting-edge digital literacy skills to place emphasis on confidence-building, interactive education and gender-receptive approaches to online conferences. Besides, join in hybrid mentoring-mentees replicas that integrate face-to-face and online mechanisms to report the confines of purely digital environments and encourage comfortable professional affairs. Legislators, faculty managements, curriculum designers and curriculum pacesetters should team up to entrench online mentoring-mentees together with blended face-to-face into teacher education programs as an official component thereby ensuring that future educators are prepared to pilot and outshine in the developing technological landscape of modern classrooms.

Limitations

This study was restricted to final-year education students from only two public universities in Kogi State which may influence the generalizability of the results to other settings. Furthermore, while the convergent similar mixed-methods offered rich insights, self-reported data may be focused to response prejudice and infrastructural constraints during data gathering occasionally restricted full contribution in online discussions.

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