



Virtual Doctoral Supervisions in Kenya: Exploring the Schools of Education in Public Universities

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Abstract: *The article sets out to examine the effect of virtual practices on doctoral graduation rates in Schools of Education in public universities in Kenya. It is based on the premise that low and uneven doctoral graduation rates persist due to limited access to graduate supervision and academic resources. In its methodology, it utilises a mixed-methods research design. Data were collected from 400 doctoral students, Chairs of Departments, and Registrars using questionnaires, interview guides, and document analysis of admission and graduation records. It is theoretically informed by the Community of Inquiry (CoI - 2000) Theory which argues that effective online learning, teaching presence, and student support enhance academic outcomes. Data were analyzed using mainly Hierarchical Linear Modeling (HLM) and thematically. In its findings, it contends that Virtual Learning, Virtual Supervision, and Virtual Graduate Student Support Practices were rated positively and had significant positive effects on doctoral graduation rates. The average doctoral graduation rate was 14.20%, with considerable variation across universities. Virtual Learning significantly improved access to academic resources and flexibility, Virtual Supervision enhanced feedback timeliness and research monitoring. The article recommends that Virtual Practices significantly improve doctoral graduation rates in public universities in Kenya by strengthening academic engagement, supervision effectiveness, and institutional support systems. It recommends strengthening digital infrastructure, enhancing structured virtual supervision, and improving graduate student support practices to promote timely doctoral completion, and hence timely doctoral graduation rates in public universities in Kenya.*

Keywords: *Virtual supervision, Graduation Rates, Doctorial students, School of Education*

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1. Introduction

Kenyan universities continue to experience challenges related to delayed completion and low graduation rates (Musasia et al., 2025). Doctoral education particularly

requires sustained academic engagement, effective supervision, access to learning resources, and supportive institutional environments. However, many doctoral students encounter constraints such as limited supervision, financial challenges, inadequate research facilities, and

competing professional or family responsibilities, which may affect their progression and graduation rates.

Globally, higher education institutions are increasingly incorporating digital technologies into teaching, learning, research, and supervision processes. Virtual learning has become an important component of higher education by providing flexible learning opportunities for students balancing academic, professional, and personal responsibilities (Means, Bakia, & Murphy, 2024). Similarly, virtual supervision has gained attention due to its potential to facilitate communication between supervisors and doctoral students regardless of geographical location (Erichsen, Bolliger, & Halupa, 2024). Previous studies indicate that virtual supervision may support student engagement, academic interaction, and continuity of research activities, although challenges related to communication quality, technological access, and learner isolation have also been reported (Wisker, Robinson, & Shacham, 2021). However, a study encompassing countries like Ethiopia, Uganda, South Africa, Kenya, Nigeria, and Tanzania reveal that Ph.D. programmes often suffer from high attrition and low completion rates, sometimes as low as 5% (British Council & DAAD, 2018).

In this study, Virtual Practices (VP) refer to digitally mediated academic and supervisory activities used to support doctoral learning and research. These practices include virtual supervision meetings, use of online learning management systems, participation in virtual seminars, digital collaboration, online academic communication, and access to electronic learning resources. The concept does not refer to Virtual Reality (VR) technology alone, but rather to broader digital academic practices within doctoral education.

In Kenya, public universities are increasingly adopting digital learning platforms, virtual supervision tools, and online academic communication systems to support postgraduate education. These practices became more prominent following disruptions caused by the COVID-19 pandemic, which accelerated the use of online learning and remote academic engagement. Through platforms such as Zoom, Microsoft Teams, Moodle, and institutional repositories, doctoral students are able to participate in virtual seminars, interact with supervisors, access electronic resources, and engage in collaborative learning activities.

Despite the growing adoption of Virtual Practices in Kenyan universities, doctoral students continue to face challenges associated with delayed completion and low graduation rates. Some students experience difficulties related to internet accessibility, digital literacy, limited institutional support, inadequate supervision, and restricted

access to technological infrastructure. Specifically, in the Schools of Education, only 10–15% of doctoral students graduate within six years, often due to factors such as governance challenges, inadequate supervision, bureaucratic delays, and insufficient research support (Commission for University Education [CUE], 2022). Additionally, the effectiveness of Virtual Practices in supporting doctoral progression and graduation remains unclear because existing studies have reported mixed findings regarding the benefits and limitations of digital learning and supervision environments.

The Kenyan government and higher education institutions have initiated efforts to strengthen digital learning infrastructure and expand the integration of technology in universities. Programs aimed at improving ICT infrastructure and digital learning environments have increased opportunities for online academic engagement among postgraduate students. However, disparities in access to technology, financial limitations, and varying institutional capacities continue to influence the implementation of Virtual Practices across universities.

Although previous studies have examined virtual learning, online supervision, and digital education in higher education, limited research has specifically focused on the relationship between Virtual Practices and graduation rates of doctoral students in Schools of Education in public universities in Kenya. Consequently, it remains uncertain whether and to what extent Virtual Practices influence doctoral students' graduation rates within the Kenyan higher education context. Therefore, this study sought to examine the effect of Virtual Practices on graduation rates of doctoral students in Schools of Education in public universities in Kenya.

2. Literature Review

Globally, universities have increasingly adopted virtual supervision due to the need for flexible learning and the rising demand for online education. Virtual supervision allows supervisors and doctoral students to interact through digital platforms such as Zoom, Microsoft Teams, and Moodle. The effectiveness of virtual supervision has been widely studied in developed countries such as the United States, the United Kingdom, and Australia (Lee, 2018).

Virtual supervision has been associated with higher graduation rates in institutions that effectively integrate it into their doctoral programs. Studies indicate that timely feedback, structured mentorship, and accessibility to academic resources enhance student progress (Archer, 2020). Thus, Archer alludes that virtual supervision is effective in enhancing timely feedback. Doctoral students

can be able to get e-learning materials and complete their thesis on time. Institutions with well-established virtual supervision programs report improved doctoral completion rates, primarily because students receive consistent guidance, reducing delays caused by logistical challenges (Huang & Hsiao, 2021).

Effective supervision remains a critical factor in virtual learning. Institutions that provide structured virtual mentoring, regular feedback sessions, and robust communication platforms ensure that doctoral students remain on track with their research timelines (Garrison, 2022). Without quality virtual supervision, students may struggle with academic isolation and delayed progress.

Despite its benefits, virtual supervision presents several challenges, including digital inequalities, lack of personal interaction, and difficulties in maintaining academic discipline. Research indicates that students who lack access to stable internet connections or are not technologically proficient struggle with virtual supervision (Bolliger & Shepherd, 2019).

In Africa, the adoption of virtual supervision is growing but faces infrastructural and technological challenges. While universities in South Africa, Egypt, and Nigeria have implemented virtual supervision, many institutions struggle with inadequate digital resources (Jowi et al., 2020). The effectiveness of virtual supervision in African doctoral education is often linked to institutional support and government policies on digital learning. Additionally, the use of virtual supervision ensures that students receive consistent academic guidance, helping them stay on track with their research.

Research suggests that virtual supervision positively influences graduation rates when supported by digital learning policies and robust e-learning infrastructure. In South Africa, universities that have invested in virtual learning platforms report improved completion rates among doctoral students (Nkuyubwatsi, 2021). However, in regions where virtual learning resources are limited, dropout rates remain high due to insufficient academic support.

Virtual supervision in Africa faces several challenges, including unreliable internet connectivity, high data costs, and resistance to technological changes. Moreover, the lack of technical training for both supervisors and students hinder the effectiveness of virtual supervision. Universities must address these issues to enhance virtual supervision outcomes (Sawyer, 2022).

In Uganda, the adoption of virtual supervision in doctoral programs is still developing, but it has begun to play a significant role in improving access and graduation rates.

Ugandan universities have started integrating online supervision as part of a blended learning approach, where traditional in-person supervision is combined with virtual methods. According to Nabende (2020), this approach has allowed doctoral students to engage with their supervisors without the logistical challenges of frequent campus visits, especially for students who live in rural areas far from university campuses. The COVID-19 pandemic accelerated this transition, and many universities adopted platforms such as Google Meet and Zoom to conduct virtual meetings. This shift in supervision has helped doctoral students to continue making progress despite the challenges posed by the pandemic and the limited access to physical facilities. Nabende (2020) found that virtual supervision in Uganda allowed students to receive immediate feedback and clarification on their research, which was crucial for reducing delays and increasing completion rates.

Despite the evident benefits, several challenges exist in these countries related to virtual supervision. In the USA, challenges include internet accessibility in rural areas and differences in the digital proficiency of students and supervisors. Similarly, in Japan, cultural factors can influence the effectiveness of virtual supervision, with some students preferring in-person guidance due to traditional hierarchical relationships. In Australia, while access to technology is less of an issue, supervisor workload can be a challenge, as virtual supervision demands more frequent and timely interactions. In Uganda, the main barriers include internet connectivity and limited access to digital tools in remote areas, which can make virtual supervision challenging, particularly for students in less urbanized regions.

The use of virtual supervision in doctoral education has been gaining traction globally, and Kenya is no exception. The effectiveness of virtual supervision on the graduation rates of doctoral students in the Schools of Education in public universities in Kenya has become an area of increasing focus. As higher education institutions embrace the integration of technology, virtual supervision offers a more flexible and accessible mode of interaction between students and their academic supervisors, particularly in contexts where face-to-face supervision may be challenging due to geographical constraints, busy schedules, or unforeseen disruptions like the COVID-19 pandemic.

Furthermore, virtual supervision is a key component of virtual learning that can positively affect graduation rates. Supervision in doctoral education is critical for students' academic progress, and virtual learning enables regular, real-time supervision through online meetings and video calls. This constant engagement between students and supervisors ensures that doctoral students receive timely

feedback and guidance, which is crucial for maintaining academic momentum. The Kenya National Commission for UNESCO (2020) emphasizes that virtual supervision improves students' academic outcomes by providing consistent and accessible guidance, which can lead to timely completion of their doctoral studies. Thus, Kenya CUE should mandate similar engagements, coupled with the embrace of the transformative VP.

Kenyan public universities have made significant strides in adopting virtual supervision, particularly after the COVID-19 pandemic accelerated digital learning initiatives. Institutions such as the University of Nairobi, Kenyatta University, and Moi University have integrated virtual supervision into their doctoral programs (CUE, 2022).

Virtual supervision has contributed to improved doctoral graduation rates in Kenyan public universities. Studies indicate that students who actively engage with their supervisors through virtual platforms tend to complete their studies faster than those relying solely on traditional supervision (Muthoni, 2023). However, variations exist based on the availability of digital resources, student engagement levels, and institutional policies.

Despite its potential, virtual supervision in Kenya faces several challenges, including limited access to digital infrastructure, inconsistent communication between students and supervisors, and inadequate training on virtual supervision tools. Additionally, some students struggle with self-discipline and time management, which affects their ability to fully benefit from virtual supervision (Odhiambo & Nyamboga, 2023). The scholar's ideas are that virtual supervision requires infrastructure and adequate training so as to equip doctoral students with the correct knowledge of accessing virtual tools of technology and integrate them into profitable use. Multiple sources highlight Kenya's supervision crisis. For example, a previous report found that 58 per cent of postgraduate students meet supervisors less than monthly, while 15 per cent wait over a year for feedback. Similarly, another study reported 62 per cent of students cited infrequent meetings as a key delay factor.

This neglect stalls progress and breeds frustration. The chronic supervision deficit might also be turning postgraduate programmes into a lottery, where a student's success depends more on luck than institutional support, wasting both talent and financial resources.

However, VP could provide virtual supervision, where students receive guidance from their supervisors regardless of geographical location. This feature of VP is particularly beneficial for students who are based in remote areas or for those who face challenges with

traditional in-person supervision due to time and logistical constraints.

In Kenya, public universities are increasingly adopting virtual supervision as a way to improve access to academic support for doctoral students. The University of Nairobi, for instance, has been utilizing video conferencing, email communication, and online platforms to ensure continuous guidance and feedback for its doctoral students (Mwangi & Njoroge, 2020). These methods of supervision allow students to stay connected with their supervisors regardless of their physical location. The flexibility that virtual supervision provides has shown promise in improving graduation rates by making it easier for students to maintain consistent communication with their supervisors, engage in research discussions, and receive timely feedback on their work.

Virtual supervision enables doctoral students to access mentorship and feedback remotely, reducing delays in communication that may occur due to logistical challenges. Njuguna (2021) suggests that the flexibility offered by virtual supervision has enhanced students' ability to balance their academic, personal, and professional responsibilities, leading to greater productivity and quicker progression in their research work. By enabling real-time feedback and online collaboration, virtual supervision allows for more frequent interactions between supervisors and students, thus fostering a more effective and sustained academic support system. This mode of interaction helps students to remain on track, address challenges as they arise, and ultimately complete their doctoral programs in a timely manner.

Further, the use of virtual platforms for supervision is particularly beneficial for students in remote areas or those who may face barriers to regular campus attendance. This was evident during the COVID-19 pandemic, when many Kenyan universities transitioned to online learning and virtual supervision models. According to the Kenya Universities and Colleges Central Placement Service (KUCCPS) (2020), the transition to virtual supervision allowed doctoral students to continue receiving academic support without the need to physically meet their supervisors. This was especially crucial for students who faced mobility restrictions or were located far from university campuses.

However, challenges remain in the Kenyan context, particularly related to internet connectivity and digital literacy. Students in rural or underserved areas may face difficulties in accessing high-quality internet services, which can hinder their ability to participate in virtual supervision sessions effectively (Omondi, 2022). Inadequate access to technology and issues of digital literacy among both supervisors and students may also

impede the effectiveness of virtual supervision. Omondi (2022) points out that despite the growing use of technology, many students and faculty members in Kenyan public universities are still grappling with challenges related to the effective use of online platforms.

Nevertheless, when virtual supervision is implemented effectively, it can greatly enhance the doctoral experience. It provides students with more autonomy and flexibility, while ensuring that academic guidance and feedback are still readily available. This is especially important for doctoral students in the Schools of Education, who are often engaged in complex, time-consuming research projects that require consistent support from their supervisors.

3. Methodology

The research article sought to analyze doctoral students' graduation rates from 2018-2022 in public universities in Kenya in the school of Education

3.1 Design

In this study, embedded mixed research design was used. This is a useful methodological approach in which a supportive study method, in this case qualitative study is integrated within a main method, quantitative study to enrich or clarify the findings. In addition, the study adopted a longitudinal panel design, where doctoral cohorts from 2018 to 2022 were tracked to determine graduation outcomes within a six-year completion window. This design was appropriate because doctoral graduation is a time-dependent outcome influenced by institutional and individual factors. To account for the hierarchical structure of the data on doctoral students nested within universities the study employed a two-level Hierarchical Linear

Modeling (HLM) framework, where Level 1 represented doctoral student characteristics and Level 2 represented university-level characteristics. The researcher was cognizant of this fact and therefore used both qualitative and quantitative research methodologies. Qualitative Methodology helped due to the nature of the population under study. In-depth interviews were conducted, where graduate students explained their experiences on the background of their expectations. Quantitative design was employed where the information needed generated quantities. CODs were most instrumental in the mixed research design. Quantitative data included demographic data, characteristics of the population and illustration by use of frequency tables, percentages and other graphical illustrations.

3.2 Target population and sample size

According to higher education statistics on the estimated number of public universities in Kenya (2024), the Country is estimated to have 39 public universities. The report also shows that the number of enrolled doctoral students grows exponentially with time. For instance, in the 2022/2023 academic year, 504 doctoral students, including the researcher, were enrolled in public chartered universities in Kenya, according to Commission for University Education. This was part of a larger increase in postgraduate enrollment, with a 20.5% jump to 34,403 students for PhDs and Masters. Therefore, the researcher estimated all the public universities whose Schools of education embrace VP technology; and the study population was estimated to be 4000 over a period of six years for five cohorts. Given that Chairs of Departments (CODs) oversee departments rather than individual programmes, the population of CODs was categorized by departments within Schools of Education instead of specific programmes.

Table 1: Target Population

University	Doctoral Students	CODs	Registrars	Total
A	146	12	2	160
B	148	12	2	162
C	145	12	1	158
D	147	13	2	162
E	146	12	2	160
F	144	11	2	157
G	145	12	1	158
H	147	12	2	161
I	147	11	2	160
J	143	12	2	157
K	147	12	2	161
L	146	11	2	159
M	148	12	2	162
N	145	11	1	157
O	148	13	2	163
P	144	11	2	157
Q	149	12	1	162
R	147	11	2	160
S	150	12	2	164
T	146	12	1	159
U	148	11	2	161
V	145	11	2	158
W	148	12	1	161
X	147	12	2	161
Y	146	12	2	160
Total	3,662	294	44	4,000

Source: **Researcher (2024)**

Table 2 University Doctoral Enrolment Estimates

University	Doctoral Program				Totals
	Education administration Policy studies and planning	Curriculum Studies	Education Psychology	Specialized Areas	
A	55	46	37	26	164
B	54	45	36	27	162
C	53	44	35	26	158
D	56	46	37	25	164
E	54	44	36	26	160
F	53	44	35	25	157
G	54	45	36	25	160
H	53	45	37	25	160
I	54	44	36	26	160
J	53	43	35	26	157
K	56	45	37	25	163
L	55	44	36	26	161
M	52	44	36	25	157
N	55	45	36	26	162
O	55	45	36	26	162
P	52	44	35	27	158
Q	53	45	36	26	160
R	54	45	35	26	160
S	55	45	35	27	162
T	53	45	35	27	160
U	53	44	34	27	158
V	52	43	35	26	156
W	52	44	35	26	157
X	55	45	35	27	162
Y	53	44	36	27	160
Totals	1344	1113	892	651	4000

Source: Researcher (2024)

3.3 Sample Size and Sampling Technique

This study employed purposive sampling technique. Thus, there was a comprehensive coverage of relevant information on virtual practices and doctoral graduation rates.

3.4 Purposive Sampling Technique

Purposive sampling was used to select 360 Doctoral Students, which included 60 Class Representatives, 30

CODs and 10 Registrars. Purposive sampling involves selecting participants based on specific characteristics that are relevant to the study objectives (Palinkas et al., 2015). Doctoral students were purposively selected based on two criteria: 1) they must have been registered in Schools of Education in public universities in Kenya, and 2) they must have engaged in virtual practices for at least one semester.

Class Representatives were included because they serve as liaison officers between students and faculty/administration, Learning direct experience on how virtual practices are communicated and implemented, and

how they affect doctoral students' progress toward graduation. These had the relevant experience, knowledge, and attributes that were pertinent to the research hypotheses in this study. Purposive sampling was particularly useful in this study because the research required in-depth information from specific groups of people i.e., CODs, Registrars and Doctoral students, thus made it easier to obtain valuable insights in the laborious research. It was a powerful tool for the qualitative research and this particular exploratory study where understanding of specific perspectives being investigated was crucial. This made them key informants for understanding student-level experiences.

The combination of qualitative data on administrative staff and quantitative data from doctoral students ensured that the study captured both institutional policy perspectives and direct student experiences regarding the effect of virtual practices on graduation rates.

According to Mugenda and Mugenda (2003) sample size must be large enough to be representative of the universe population. The researcher used a Krecjie and Morgan (1970) formula to come up with a sample size as shown below;

$$S = \frac{X^2 NP}{1-P}$$

$$d^2 (N-1) + X^2 P (1-P)$$

Where,

S is the desired sample size

X² is the table value of chi-square for one degree of freedom at desired confidence level which is 1.96 x 1.96= 3.8416

N is the population size

P is the population proportion assumed to be 0.5 since this will provide maximum sample size and d is the degree of accuracy expressed as a proportion 0.05

$$S = \frac{3.8416 \times 4000 \times 0.5 (1-0.5)}{0.05^2 (4000-1) + 3.8416 \times 0.5 (1-0.5)}$$

According to Kothari (2004), a representative sample size is one which is at least 10% of the targeted population, thus the choice of 64.10% is considered as a representative sample size of the population.

The researcher drew a sample size of 400 respondents from what is illustrated in table 3

Table 3 Sample size

Group	sampling Techniwue	Sample Size
Chairs of Departments (CODs)	Purposive	30
Academic Registrars (Postgraduate Studies)	purposive	10
Class Representatives (Doctoral Students)	purposive	60
Doctoral Students	purposive	300
Total		400

Source: Researcher (2024)

Purposive sampling was used to select participants based on the specific characteristics that align with the doctoral students' learning activities in the Schools of Education in public Universities in Kenya. Both homogeneous and maximum variation sampling methods were used.

3.5 Instruments

The instruments of data collection were: Questionnaires, Interview Guides and Document analysis guides. A questionnaire was used to collect data from Doctoral students on the effect of virtual supervision on Doctoral students' graduation rates in public universities in Kenya. In addition, interviews with Chairs of Departments, Registrars and Class Representatives on graduation rates of doctoral students were conducted.

4. Results and Discussion

4.1 Effect of Virtual Supervision on Graduation Rates of Doctoral Students

The second objective of the study was to determine the effect of Virtual Supervision on graduation rates of doctoral students in the Schools of Education in public universities in Kenya. The analysis follows the sequence of univariate, bivariate, multivariate diagnostic tests, hypothesis testing and discussion. This section presents the analysis of the effect of Virtual Supervision on doctoral graduation rates. Virtual Supervision was conceptualized as a critical academic support mechanism that enhances communication between supervisors and doctoral students, reduces delays in feedback, and improves research milestone tracking through digital platforms.

4.2 Bivariate Analysis: Virtual Supervision and Graduation Rates

A Pearson correlation analysis was conducted to examine the relationship between Virtual Supervision scores and doctoral graduation rates.

Table 4: Mean Differences in Graduation Rates by Virtual Supervision Category

Virtual Supervision Category	Mean Graduation Rate (%)	Std. Dev	F-value	p-value
High (score ≥ 8.0)	17.84	3.90	7.24	0.001
Medium (score 6.0–7.8)	13.20	4.10		
Low (score < 6.0)	9.60	4.80		

Source: Field Data, 2025

The results (Table 4) indicate statistically significant differences in doctoral graduation rates across Virtual Supervision categories ($F = 7.24$, $p = 0.001$). Universities/departments with high Virtual Supervision scores recorded the highest mean graduation rates

(17.84%), while those with low scores recorded the lowest (9.60%). These differences justify further HLM analysis to determine the net effect of Virtual Supervision while controlling for other variables.

Table 5: Pearson Correlation between Virtual Supervision and Graduation Rates

Variable	Graduation Rates	Virtual Supervision
Graduation Rates	1.000	
Virtual Supervision	0.574	1.000

Source: Field Data, 2025 **Note: $p < 0.001$**

Table 5 shows a significant positive correlation between Virtual Supervision and graduation rates ($r = 0.574$, $p < 0.001$), confirming that more effective virtual supervision arrangements are associated with higher doctoral graduation rates.

Table 6 below presents the results of the unadjusted model examining the effect of Virtual Supervision on doctoral graduation rates without controlling for other variables.

Table 6: Effect of Virtual Supervision on Graduation Rates (Unadjusted Model)

Fixed Effects	Coefficient	Std. Error	Z	p-value
Intercept	5.180	2.420	2.14	0.032
Virtual Supervision	2.230	0.580	3.84	0.001
Random Effects			Variance	
Between Universities			16.840	
Within Universities			61.380	

Source: Field Data, 2025

The intercept value of 5.180 indicates the baseline doctoral graduation rate when Virtual Supervision is not considered in the model. This provides a reference point for understanding the contribution of supervision practices to graduation outcomes.

The results show that Virtual Supervision has a strong, positive, and statistically significant effect on doctoral graduation rates ($\beta = 2.230$, $p < 0.001$). This implies that a one-unit increase in the Virtual Supervision score is associated with an increase of approximately 2.23

percentage points in doctoral graduation rates. This finding suggests that improved supervision practices delivered through virtual platforms such as timely feedback, online meetings, and effective milestone tracking significantly enhance doctoral students' likelihood of completing their studies.

The random effects indicate substantial variability in graduation rates across universities, with a between-university variance of 16.840 and a within-university variance of 61.380. This suggests that while Virtual

Supervision plays an important role, differences in institutional contexts also contribute significantly to variations in doctoral completion rates. Therefore, the results from Table 7 demonstrate that Virtual Supervision is a key predictor of doctoral graduation rates in public universities in Kenya, even before controlling for student and institutional background characteristics.

4.3 Full Model: Virtual Supervision + Control Variables

Table 7 presents the Effect of Virtual Supervision on Graduation Rates (Full Model).

Table 7: Effect of Virtual Supervision on Graduation Rates (Full Model)				
Fixed Effects	Coefficient	Std. Error	Z	p-value
Intercept	4.640	2.360	1.97	0.049
Virtual Supervision	1.890	0.540	3.50	0.001
Employment (Full-time)	-0.680	0.400	-	0.089
Supervisor: Internal	1.140	0.540	2.11	0.035
Graduate Academic Policy	1.380	0.620	2.23	0.026
Random Effects			Variance	
Between Universities			12.360	
Within Universities			58.640	
Model Fit Statistics			Value	
Log Likelihood			-1,008.24	
AIC			2,028.48	
BIC			2,056.80	

Source: Field Data, 2025

The full model confirms that Virtual Supervision remains a significant predictor of doctoral graduation rates ($\beta = 1.890$, $p < 0.001$) after controlling for background characteristics. The reduction in between-university variance from 18.42 to 12.36 indicates that Virtual Supervision explains a significant portion of institutional variation in graduation rates.

4.8 Document Analysis Findings

Analysis of supervision records, thesis progress reports, and institutional supervision policy documents provided additional support for the questionnaire findings. Progress tracking documents from sampled universities showed that students under virtual supervision arrangements submitted thesis chapters more regularly compared to those relying solely on face-to-face supervision. Institutional records further indicated that universities with formal virtual supervision policies including documented communication schedules and milestone tracking frameworks had higher rates of thesis completion within the stipulated time. However, document analysis also revealed that not all universities had formalized virtual supervision guidelines, with some relying on informal arrangements that were difficult to monitor and evaluate, potentially contributing to the lower scores observed in research milestone tracking.

4.9 Interview Findings

Interview findings strongly affirmed the positive role of Virtual Supervision in advancing graduation rates. Doctoral students reported that the shift to virtual supervision had made their supervisors significantly more accessible. One class representative explained #1;

Theme: Virtual Supervision and Doctoral Graduation Rates:

"I used to wait months for a supervision meeting because my supervisor was always travelling or had other commitments. With virtual supervision, we meet every two weeks on Zoom and I get feedback within days. My thesis is moving much faster now."

Several students noted that the increased frequency of communication through virtual platforms had translated directly into faster feedback on their work. Another doctoral student class representative shared #2;

"My supervisor sends comments on my chapters through email and we discuss them online. I no longer have to wait until we are both physically available. This has cut down my revision time significantly and I can see myself finishing on time."

Supervisors, on the other hand, acknowledged that virtual tools had allowed them to manage their supervision workload more effectively. One COD noted #3;

"I supervise students from different counties and even different countries. Without virtual tools, this would be impossible to manage effectively. I can now track each student's progress and respond to their needs promptly."

A recurring concern raised during interviews, however, was the variability in supervisors' proficiency with digital tools. One Class representative expressed frustration #4;

"My supervisor is not very comfortable with technology. Sometimes our virtual meetings are cut short because of connection problems or he does not know how to share documents online. It slows things down on my end."

Notwithstanding this limitation, the overall interview evidence pointed clearly to Virtual Supervision as a significant contributor to improved doctoral graduation rates. A registrar at one of the sampled universities summarized it well #5;

"Virtual supervision has transformed how we support our doctoral students. The ones who are actively

supervised virtually are completing their theses faster and with better quality. The evidence is right there in our graduation numbers."

4.10 Hypothesis Testing – Objective Two

Null Hypothesis (**H₀₂**): There is no statistically significant relationship between Virtual Supervision and graduation rates of doctoral students in the Schools of Education in public universities in Kenya. Based on full model results ($\beta = 1.890$, $p < 0.001$), **H₀₂** is rejected. Virtual Supervision significantly and positively influences doctoral graduation rates.

4.11 Diagnostic Tests for HLM Models (Multicollinearity)

Table 8 presents the Variance Inflation Factor (VIF) results used to assess multicollinearity among the variables included in the Virtual Supervision model.

Table 8: Variance Inflation Factor (VIF) for Virtual Supervision Model

Variable	VIF
Virtual Supervision	1.42
Employment Status	1.25
Supervisor Status	1.20
Graduate Academic Policy	1.18

Source: Field Data, 2025

All VIF values are below 5; multicollinearity is not a concern in the model.

The hypothesis tested whether there is a statistically significant relationship between Virtual Supervision and doctoral graduation rates in Schools of Education in public universities in Kenya. The null hypothesis (**H₀₂**) stated that Virtual Supervision has no significant effect on graduation rates. The results from the full model indicate that Virtual Supervision has a positive and statistically significant effect on doctoral graduation rates ($\beta = 1.890$, $p < 0.001$). This implies that an improvement in Virtual Supervision practices by one unit leads to an increase of approximately 1.89 percentage points in doctoral graduation rates. Since the p-value is less than 0.05, the effect is statistically significant.

Based on these findings, the null hypothesis is rejected. This leads to the conclusion that Virtual Supervision significantly influences doctoral graduation rates in public universities in Kenya. The results therefore confirm that effective supervision practices delivered through virtual platforms play a critical role in supporting doctoral students to complete their studies successfully.

The results show that Virtual Supervision recorded a VIF value of 1.42, while Employment Status, Supervisor Status, and Graduate Academic Policy recorded VIF values of 1.25, 1.20, and 1.18 respectively. All the VIF values are well below the conventional threshold of 5, indicating that there is no evidence of multicollinearity among the independent variables. This means that the variables are not highly correlated and therefore do not distort the regression estimates. Therefore, the results confirm that each predictor contributes independently to explaining variations in doctoral graduation rates, and the model is statistically stable and suitable for interpretation.

4.13 Discussion of Findings

The findings reveal that Virtual Supervision has a significant positive effect on doctoral graduation rates. Universities with more effective virtual supervision systems characterized by regular online meetings, timely feedback, and milestone tracking record notably higher graduation rates. This is consistent with Bennett and Kane

(2021) and Waweru (2021), who emphasize that structured online supervision and timely feedback enhance doctoral progression.

The interview evidence enriches these findings: doctoral students who had regular virtual supervision meetings reported faster thesis progress and reduced time-to-degree. This corroborates Archer (2020) and Garrison (2022), who highlight that accessible and responsive supervision whether face-to-face or virtual is a critical determinant of doctoral success. However, the finding that the model explains only 32.9% of the variation in graduation rates implies that Virtual Supervision, while important, is not the sole determinant of doctoral completion. Broader institutional factors including funding, research competence, and ICT infrastructure also play critical roles. These limitations highlight the need for a comprehensive approach to doctoral support that extends beyond supervision alone.

Similarly, the findings agree with Maina (2019), who observed that internal supervisors in UoN and KU who adopted digital communication were associated with higher completion timelines. Maina suggested that internal supervisors provide better access to departmental resources and faster administrative processing. The present findings reinforce this position by demonstrating that Supervisor: Internal $B = 1.140$, $p = 0.035$, remains significant alongside Virtual Supervision. This indicates a complementary effect: internal mentorship + virtual tools = higher graduation likelihood.

The results also align with the observations of Gudo, Oanda, and Olel (2011), who reported that Kenyan doctoral students preferred blended supervision because it allowed asynchronous engagement. According to Gudo et al., flexibility is critical where many doctoral candidates are full-time lecturers. The current study supports this perspective, particularly because Graduate Academic Policy $B = 1.380$, $p = 0.026$, was also a significant predictor. This implies that universities with clear policies on online supervision, milestone tracking, and digital submission create more favorable conditions for graduation.

The findings, however, partially contradict those of Hanushek (2023), who argued that institutional delivery mechanisms have limited influence on outcomes once student-level factors are accounted for. While the present study found that Employment (Full-time) was not statistically significant, $B = -0.680$, $p = 0.089$, the effect of Virtual Supervision remained highly significant after controlling for employment. This suggests that virtual supervision exerts an independent influence on graduation beyond workload status.

The findings also differ slightly from those of Asadullah (2025), who reported that organizational delivery structures often lose significance when individual factors are included. In contrast, the current study found that both Virtual Supervision and Graduate Academic Policy retained significance after adjusting for employment and supervisor type. This indicates that institutional virtualization and policy clarity continue to shape doctoral outcomes.

A major strength of the current study lies in its use of a multilevel model, which enabled the simultaneous examination of candidate-level and university-level effects. The substantial Between Universities Variance = 12.360 versus Within Universities = 58.640 confirms that university-level factors still explain differences in graduation rates. The model fit statistics, Log Likelihood = 1,008.24; AIC = 2,028.48; BIC = 2,056.80, further confirm model adequacy. The significant Intercept, $p = 0.049$, also indicates a well-specified baseline model.

The study therefore contributes to the existing literature in several important ways. First, it provides empirical evidence from Kenya on the relationship between Virtual Supervision and doctoral graduation rates, an area that has received limited attention to date in the post-COVID era. Second, it demonstrates that Virtual Supervision, Internal Supervision, and Graduate Academic Policy each make independent contributions to graduation rate. Third, it shows that employment status, while negative in direction, does not negate the positive effect of virtualization, as evidenced by the non-significant $p = 0.089$.

In conclusion, the findings largely support existing literature emphasizing the advantages associated with virtualized supervision and clear academic policy in promoting doctoral graduation. At the same time, the study refines existing understanding by showing that the effects of Virtual Supervision are robust to employment and supervisor type. The findings underscore the need for universities to institutionalize virtual supervision guidelines, strengthen internal supervision capacity, and codify graduate academic policy on online engagement to enhance doctoral graduation rates.

5. Conclusion and Recommendations

5.1 Conclusion

The study concludes that Virtual Supervision significantly influences doctoral graduation rates in public universities in Kenya. The results show that timely feedback, consistent virtual engagement, milestone tracking, and structured online supervisory communication contribute to improved

doctoral completion outcomes. Therefore, effective digital supervision systems play a critical role in supporting doctoral students to complete their studies within the expected timeframes.

5.2 Recommendations

The article on the effect of Virtual Supervision on graduation rates of doctoral students of the Schools of Education in public universities in Kenya, the study concludes that Virtual Supervision significantly influences doctoral graduation rates in public universities in Kenya. The results show that timely feedback, consistent virtual supervisory communication contributed to improved doctoral graduation outcomes. Therefore, effective digital supervision systems play a critical role in supporting doctoral students to complete their studies within the expected timeframes.

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