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THE INFLUENCE OF TEACHERS' PERSONAL CHARACTERISTICS ON INTEGRATION OF ICT IN PEDAGOGICAL PRACTICES: A STUDY ON KENYAN SECONDARY SCHOOL TEACHERS

(Research article)

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Abstract

This quantitative cross-sectional study investigated the influence of selected personal attributes on the integration of Information and Communication Technology (ICT) tools in pedagogical practices among secondary school teachers in Nyeri county, Kenya. The study targeted a population of 3,141 teachers, employing a stratified sampling technique to ensure representation across gender, age groups, and educational levels. The sample size of 341 teachers was determined using the modified Cochran's formula. Data was collected through a structured questionnaire, focusing on personal attributes such as self-efficacy, attitude, creativity, problem-solving, adaptability, continuous learning, and resilience, along with the level of ICT integration in teaching practices. Ordinal regression analysis was utilized to explore the predictive relationships between these attributes and ICT integration. Results revealed significant findings regarding the influence of personal attributes on ICT integration. Self-efficacy in ICT use was found to be a significant predictor ($\chi^2 = 16.128$, $p = .001$), with teachers exhibiting higher self-efficacy more likely to integrate ICT tools into their teaching practices. Attitude towards ICT also emerged as a significant predictor ($\chi^2 = 7.981$, $p = .018$), indicating that teachers with positive attitudes towards ICT were more inclined to integrate technology into their teaching methods. Creativity ($\chi^2 = 17.430$, $p < .001$), adaptability ($\chi^2 = 15.537$, $p = .001$), continuous learning ($\chi^2 = 93.406$, $p = .000$), and resilience ($\chi^2 = 10.964$, $p = .004$) were also identified as significant predictors of ICT integration. However, problem-solving orientation did not significantly impact ICT integration ($\chi^2 = 1.465$, $p = .481$). The study emphasized the complexity of factors affecting ICT integration in teaching, stressing the role of teachers' personal attributes in shaping technology utilization. It filled gaps in the literature by identifying specific personality traits that influence the adoption of ICT tools. Future research could explore additional factors and interventions to address identified challenges.

Keywords: ICT integration, personal attributes, secondary school teachers, self-efficacy, ICT tools

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1. Introduction

1.1 Background to the Problem

The integration of Information and Communication Technology (ICT) in education is regarded as a crucial response to the demands posed by contemporary globalization. The incorporation of ICT in education serves as a fundamental means to address the challenges presented by a globalized society in the 21st century. This approach is envisioned to shape education, aligning it with the needs and dynamics of the current era (Lawrence, J. E. 2022). The process of ICT integration within educational contexts involves the extensive application of technological tools and resources across curricular frameworks, aiming to augment the quality and efficacy of teaching and learning processes.

Kler's (2014) emphasized the necessity for teachers to seamlessly integrate ICT into their daily teaching practices, replacing traditional methods with modern tools and facilities to foster effective learning. Kler (2014) underscored the importance of teachers being well-equipped with ICT competencies and a positive attitude to provide students with ICT-based learning opportunities, thereby enhancing the quality of education.

Prior research endeavors have shed light on fundamental factors influencing the integration of ICT in educational settings. Notably, studies like the one conducted by Papaioannou and Charalambous (2011) in Cyprus primary schools delved into the attitudes of school principals towards ICT, identifying critical facilitators and inhibitors in the integration process. These encompass both internal factors such as leadership qualities, teacher competence, and stakeholder involvement, and external elements like technical support and governmental policies, which collectively shape the adoption of ICT in educational settings.

Moreover, Lawrence (2022) underscored the significance of various drivers influencing teachers’ utilization of ICT. He emphasized teachers' support and positive attitudes towards educational technology as important drivers influencing teachers’ utilization of ICT in teaching. Additionally, teachers’ characteristics, such as age, gender, educational experience, and ICT knowledge, were found to influence integration, with proficient teachers better equipped to assess ICT's efficacy in teaching and learning activities.

Technological factor, including compatibility, ease of use, usefulness, and perceived benefits, are crucial in integrating ICT into education. These elements improve teaching, student engagement, and productivity. Compatibility, in particular, is vital because it ensures that ICT fits well with teachers' existing methods and requirements. Research using frameworks like the Technology

Acceptance Model (TAM) and Innovation Diffusion Theory (IDT) shows that compatibility significantly affects how well new technologies are adopted, influencing both educators' attitudes and student outcomes (Granić, A. 2022).

Habibu, Mamun, and Clement (2012) conducted a study aimed at uncovering the challenges encountered by teachers in integrating Information and Communication Technology (ICT) into classroom teaching and learning within technical and higher educational institutions in Uganda. Recognizing the pivotal role of ICT in preparing students for the demands of the information age, the investigation sought to identify barriers hindering successful technology adoption among teachers. The study's findings underscored teachers' strong inclination towards integrating ICT despite encountering significant difficulties. Key obstacles included the lack of genuine software, inadequate computer access in classrooms, slow internet speeds, limited motivation from both teachers and students to utilize ICT, insufficient training, outdated ICT equipment, shortage of technical expertise, inadequate administrative support, and deficiencies in course curriculum. The authors emphasized the importance of understanding the barriers and cost-effectiveness of different approaches to ICT integration in teacher training, urging policymakers and teacher trainers to explore viable strategies to facilitate meaningful changes in ICT use within educational settings.

Gichimu (2016) underscored the pivotal role of ICT training for teachers, which positively influenced their confidence and competence in integrating technology into pedagogical practices. Consequently, the study underscored the importance of regular in-service training to bridge the gap in computer skills among teachers. In addition. Ongwenyi, Mumo, and Mueni (2023) emphasized the crucial role of school type in effective ICT integration within secondary school education contexts. Furthermore, the authors emphasized teacher training as a key determinant of teachers' readiness to utilize ICT in their teaching practices.

Muia (2021) discussed the role of teachers' characteristics in determining the efficacy of ICT integration practices. As echoed in the Technological Pedagogical Content Knowledge (TPACK) Model and the Technology Acceptance Model (TAM), Muia's (2021) study emphasized that successful ICT integration goes far beyond simply providing hardware and connectivity. Rather, it is dependent on the complex interplay of teachers' ICT literacy, attitudes toward technology, and the availability of ICT resources. Notably, the study's regression analysis elucidated that teachers' ICT literacy emerged as the most influential predictor of ICT integration.

It is notably clear that amidst the existing research emphasizing diverse factors influencing the integration of ICT in education, a notable gap persists in

understanding the intricate interplay of specific personal attributes among teachers that could significantly impact the successful adoption and effective utilization of ICT tools in their teaching practices. Existing research lacks an in-depth exploration of the influence of teachers' personal attributes such as self-efficacy, creativity and innovation, problem-solving, adaptability, continuous learning and resilience on ICT integration within the pedagogical framework. Recognizing this gap, this study endeavored to address the inadequacies in the

existing literature by meticulously examining these personal attributes and their influence on integrating ICT tools into teaching methodologies.

The objective of this study was therefore to investigate the influence of selected teachers' personal attributes, including self-efficacy, attitude, creativity, problem-solving, adaptability, continuous learning and resilience on the integration of ICT in teaching practices among secondary school teachers in Kenya.

1.2 Statement of the Problem

The integration of Information Communication Technology (ICT) into educational settings has emerged as a pivotal aspect of modern pedagogy, with significant implications for teaching and learning practices. Policy frameworks in Kenya, exemplified by Sessional Paper number 14 of 2012, underscore the government's recognition of ICT integration in teaching and learning as fundamental to Kenya's aspirations of becoming a knowledge economy by 2030. This acknowledgment has spurred concerted efforts to equip the education sector with requisite ICT skills, manifested through the provision of technology infrastructure, educational content, and teacher training initiatives. ICT's transformative potential in education is underscored by its facilitation of student-centered learning approaches, self-directed inquiry, and collaborative engagement among peers.

The government's initiative to distribute laptops to school children reflects a strategic alignment with this agenda, indicative of a paradigm shift in the interaction between teachers, pupils, and the curriculum. However, this technological revolution also presents challenges, particularly regarding the need for teachers to adapt to evolving learning dynamics. Anticipating these changes, the Teachers Service Commission (TSC), in accordance with the TSC Act 2012, has embarked on a comprehensive capacity-building program aimed at empowering teachers and education managers to effectively harness ICT tools for educational enrichment. Central to this initiative is a harmonized curriculum structure, collaboratively developed with input from key stakeholders, which serves as a guiding framework for teacher training endeavours.

Despite the government's efforts and initiatives, there remains a gap in understanding which teachers' individual characteristics influence integration of ICT in their teaching practices. it becomes imperative therefore, to explore the role of selected personal attributes of teachers such as self-efficacy, attitude, creativity, problem-solving, adaptability, continuous learning, and resilience in their adoption and utilization of ICT tools within teaching methodologies. Addressing this gap is crucial for enhancing ICT integration in Kenyan educational settings and ensuring effective utilization of technology for educational enrichment and advancement.

To achieve this purpose, the following null hypothesis was formulated and tested at .05 confidence level of significance:

$H_{0:}$ There is no significant influence of selected personal characteristics (self-efficacy, attitude, creativity, problem-solving, adaptability, continuous learning and resilience) on the utilization of ICT tools in pedagogical methods among secondary school teachers in Kenya.

1.2 Theoretical Framework

In exploring the intricate dynamics of integrating Information and Communication Technology (ICT) into pedagogical practices among Kenyan secondary school teachers, this study is underpinned by the Technological Pedagogical Content Knowledge (TPACK) Model. Developed by Mishra and Koehler (2006), the TPACK Model offers a comprehensive framework to understand how teachers' personal characteristics influence their readiness and ability to effectively integrate ICT into teaching practices within the Kenyan educational context.

At its core, the TPACK Model posits that effective teaching requires the intersection of three essential components: Technological Knowledge (TK), Pedagogical Knowledge (PK), and Content Knowledge (CK). In the context of this study, the TPACK Model provides a lens through which to examine how teachers' personal attributes intersect with these components to impact ICT integration in pedagogical practices.

Within the framework of Technological Knowledge (TK), teachers' self-efficacy in ICT use emerges as a critical factor influencing the extent to which they integrate technology into their teaching. Higher levels of self-efficacy indicate teachers' confidence and proficiency in utilizing ICT tools to enhance student learning experiences. Additionally, continuous learning, as identified in the study, reflects teachers' ongoing efforts to enhance their technological skills and adapt to the evolving landscape of educational technologies. These aspects of TK are pivotal in shaping teachers' readiness to embrace ICT in their pedagogical approaches.

Moreover, Pedagogical Knowledge (PK) plays a central role in guiding teachers' instructional strategies and approaches to ICT integration. Teachers' attitudes towards ICT use significantly impact their willingness to incorporate technology into classroom activities. Moreover, creativity and innovation, identified as predictors of ICT integration, are integral components of PK. Teachers who demonstrate creativity and openness to innovation are better positioned to design technology-enhanced lessons that engage students and promote deeper learning experiences.

In addition, while the study primarily focuses on technological and pedagogical aspects, the Content Knowledge (CK) component of the TPACK Model remains implicit. Teachers' subject matter expertise, coupled with their proficiency in technology and pedagogy, enables them to design contextually relevant learning experiences that align with curriculum objectives and student needs. The integration of ICT thus becomes a synergistic endeavour that intertwines with content-specific instructional goals and objectives.

The TPACK Model therefore provides a robust theoretical framework for understanding the complex interplay between teachers' personal characteristics and their readiness to integrate

ICT into pedagogical practices among Kenyan secondary school teachers. By examining the intersection of technological, pedagogical, and content knowledge, this framework elucidates the multifaceted nature of effective technology integration and underscores the importance of addressing teachers' personal attributes in fostering meaningful educational change within the Kenyan context. Through the lens of the TPACK Model, this study aims to contribute valuable insights to the discourse on ICT integration in pedagogy, thereby informing policy and practice in Kenyan secondary education.

2. Methodology

2.1 Research Design

The study adopted, a quantitative cross-sectional research design to examine the influence of selected teachers' personal attributes on the integration of Information and Communication Technology (ICT) tools in teaching practices. The design involved a one-time data collection process aimed at capturing a snapshot of both personal attributes and the prevailing ICT integration among teachers in Kenya. The research methodology relied on a structured questionnaire to collect data on personal attributes (self-efficacy, attitude, creativity, problem-solving, adaptability, continuous learning and resilience) and the utilization of ICT tools in pedagogical methods among secondary school teachers. Ordinal regression analysis was employed to explore the influence of the predictor variables on the dependent variable. The chosen design's efficiency lay in its ability to gather a comprehensive dataset within a short period, offering insights into the influence of teachers' personal attributes on their utilization of ICT tools in teaching practices.

2.2 Target Population

The study targeted all secondary school teachers employed by the Teachers Service Commission (TSC) in Nyeri county, Kenya. The teachers in the county are 3,141.

2.3 Sampling Procedure

To ensure a comprehensive representation of teachers across the area of study, a stratified sampling technique was employed. Stratification was based on factors such as gender, age groups, and educational levels. This approach aimed to ensure that each subgroup of teachers was adequately represented in the sample. Specifically, the population of teachers was divided into distinct strata based on gender (male, female,), age brackets and educational qualifications (diploma, bachelor's degree, master's degree, PhD). Within each stratum, simple random sampling was then conducted using computer-generated random numbers to select participants. This sampling strategy facilitated an unbiased selection of participants while also considering specific characteristics as mediating variables. By stratifying the population and drawing random samples from each stratum, the sampling method ensured that all subgroups of teachers had an equal chance of being selected, thereby enhancing the representativeness and reliability of the study findings. This inclusive approach aimed to capture a diverse

perspective across different gender identities, age ranges, and educational qualifications among teachers, thereby enriching the study's overall insights and conclusions.

2.4 Sample Size

The modified Cochran's (1977) formula ($n_{adj} = \frac{n}{1+\frac{n-1}{N}}$) was used to calculate the appropriate sample size from the population of 3141 teachers. Applying the formula, for a population of 3141, with a 95% confidence level and a 5% margin of error, the recommended sample size was about 341.

2.5 Data Collection Tools and Procedure

A structured questionnaire was developed to gather comprehensive data encompassing various personal attributes and the level of ICT integration among the respondents. The questionnaire was designed to capture key attributes such as technological proficiency, adaptability, innovation mindset, attitude towards ICT, self-efficacy, and resilience. These attributes were selected based on their significance in understanding teachers' readiness and capacity for integrating ICT into their teaching practices effectively.

To streamline the data collection process and ensure efficiency, the questionnaires were distributed electronically to the selected respondents. Using electronic platforms and communication such as email and online survey platforms, the questionnaires were electronically delivered to the targeted participants. This electronic dissemination method enabled swift and convenient access to the questionnaire, facilitating a seamless data collection process.

Upon receiving the questionnaire, respondents were provided with clear instructions and guidelines for completing it. They were encouraged to respond thoughtfully and honestly, as their insights and perspectives were invaluable for the study.

The questionnaire was structured to include sections addressing both personal attributes and the level of ICT integration. For personal attributes, respondents were presented with items or statements related to technological proficiency, adaptability, innovation mindset, attitudes towards ICT integration, self-efficacy, and openness to change. They were asked to rate their agreement or proficiency levels on a predetermined scale or Likert-type scale.

Regarding ICT integration, respondents were asked to provide information regarding their familiarity with and frequency of use of various ICT tools and resources in their teaching practices. This section aimed to gauge the extent to which teachers incorporated ICT into their instructional activities and the level of integration achieved.

The electronic nature of the questionnaire allowed for efficient data collection and management. Responses were automatically recorded and stored electronically, minimizing the risk of data loss or errors associated with manual data entry.

2.6 Data Analysis

Ordinal regression analysis was used to explore and quantify the relationships between identified personal attributes and the extent of ICT integration in the teaching practices. The application of ordinal regression in this study was well-founded due to the ordinal nature of both the dependent variable, which represented various levels of ICT tool integration among teachers in Kenya, and the predictor variables that encompassed teachers' personal attributes collected via Likert scale items. As the Likert scale responses inherently possessed an ordered structure, ordinal regression proved fitting to analyze the relationships between these ordinal predictor variables and the ordered categories of ICT integration. This approach enabled the study to appropriately model and explore how the teachers' personal attributes, measured on Likert scales, impacted the different levels of ICT integration within their teaching practices. It ensured a comprehensive examination of these relationships while accounting for the ordinal nature of the data. The Statistical Package for Social Sciences (SPSS) version 27 software was utilized in data analysis.

2.7 Limitation of the Study

The methodology did not account for changes over time and might have been influenced by specific events or biases present during the data collection period, potentially impacting the generalizability of findings.

3. Results

3.1 Demographic Information of Participants

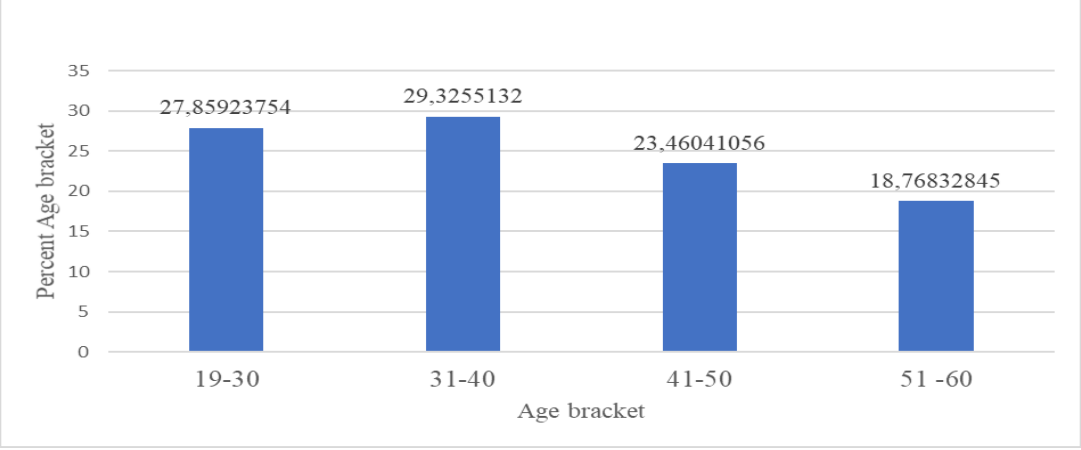

Fig. 1 Distribution of Participants Across Different Age Brackets

The distribution of participants across different age brackets is depicted in Figure 1. The largest proportion of participants falls within the age range of 31-40 years (29.3%), followed

closely by the age range of 19-30 years (27.9%). Individuals aged 41-50 years constitute 23.5% of the sample, while those aged 51-60 years comprise the smallest proportion at 18.8%.

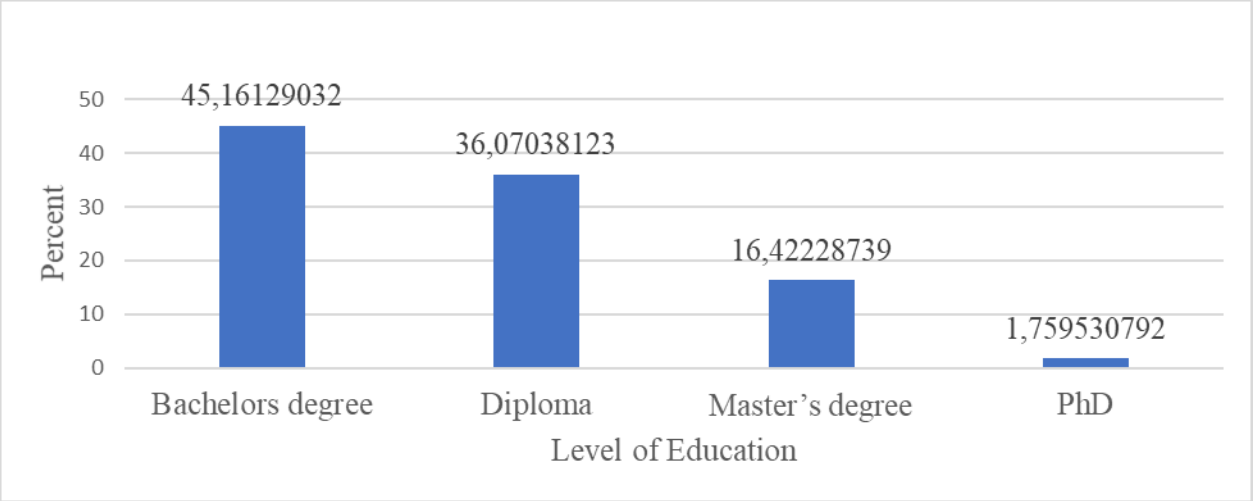

Fig. 2 Distribution of Participants' Level of Education

The distribution of participants' level of education is presented in Figure 2. Among the sample, the most prevalent level of education is a bachelor's degree, constituting 45.2% of participants. Following closely, individuals holding a Diploma represent 36.1% of the sample. Participants with a master's degree comprise 16.4%, while those with a PhD constitute the smallest proportion at 1.8%.

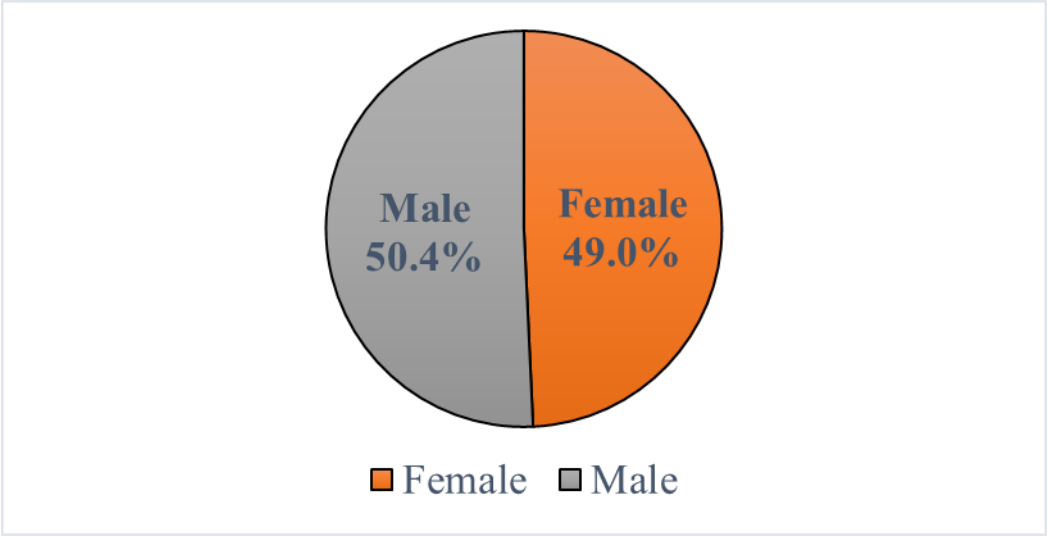

Fig. 3 Distribution of Participants by Gender

The distribution of participants by gender is illustrated in Figure 3. The sample is almost evenly distributed between males, comprising 50.4%, and females, comprising 49.0%. A

negligible proportion of participants did not specify their gender, constituting 0.6% of the sample.

3.2 Influence of Self-efficacy on ICT Integration in Teaching among Secondary School Teachers

An ordinal regression analysis was conducted to investigate the potential predictive relationship between self-efficacy in technology use and the integration of ICT in teaching practices. The model fitting information revealed notable findings.

Table. 1 Self Efficacy as a Predictor of ICT Integration in Teaching

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	121.026			
Final	104.897	16.128	3	.001

Link function: Logit.

Table 1 reveals that, Initially, an intercept-only model was established, yielding an -2 Log Likelihood value of 121.026. Subsequently, a final model, which included self-efficacy in technology use as a predictor, resulted in a significantly reduced -2 Log Likelihood of 104.897. The comparison between the intercept-only and final models exhibited a chi-square value of 16.128 with 3 degrees of freedom (df), attaining statistical significance ($\chi^2(3) = 16.128$, $p = .001$).

3.3 Influence of Attitude Towards ICT Integration in Teaching among Secondary School Teachers

The ordinal regression analysis investigated the predictive nature of attitude towards ICT use and the level of ICT integration in teaching practices. The model comparison revealed significant results.

Table. 2 Attitude Towards ICT as a Predictor of ICT Integration in Teaching

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	105.375			
Final	97.394	7.981	2	.018

Link function: Logit.

It is evident from table 2 that initially, an intercept-only model was established, resulting in an -2 Log Likelihood value of 105.375. Subsequently, a final model was constructed, incorporating attitude towards ICT use as a predictor, which led to a decreased -2 Log Likelihood of 97.394. The comparison between the intercept-only and final models yielded a chi-square value of 7.981 with 2 degrees of freedom (df), reaching statistical significance ($\chi^2(2) = 7.981$, $p = .018$).

3.4 Influence of Creativity and Innovation on ICT Integration in Teaching among Secondary School Teachers

An ordinal regression analysis was conducted to examine the impact of creativity and innovation on the integration of Information and Communication Technology (ICT) in teaching practices among secondary school teachers.

Table. 3 Creativity and Innovation as a Predictor of ICT Integration in Teaching

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	109.909			
Final	92.479	17.430	2	.000

Link function: Logit.

Table 3 revealed that the Final model exhibited a significantly better fit to the data compared to the Intercept Only model, as indicated by a lower -2 Log Likelihood ($\chi^2 = 92.479$) and a significant chi-square value ($\chi^2 = 17.430$, $df = 2$, $p < .001$). The significance level ($p = .000$) suggests that the improvement in model fit is statistically significant.

3.5 Influence of Problem-Solving Orientation on ICT Integration in Teaching among Secondary School Teachers

An ordinal regression analysis was conducted to investigate the influence of problem-solving orientation on the integration of Information and Communication Technology (ICT) in the learning process.

Table. 4 Problem-Solving Orientation as a Predictor of ICT Integration in Teaching

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	95.483			
Final	94.018	1.465	2	.481

Link function: Logit.

Table 4 revealed that the final model, which incorporated problem-solving orientation as a predictor, exhibited a slightly lower -2 Log Likelihood of 94.018. Moreover, the difference in model fit between the initial and final models was not statistically significant ($\chi^2 = 1.465$, df = 2, p = .481). This suggests that the inclusion of problem-solving orientation as a predictor did not significantly improve the fit of the model.

3.6 Influence of Adaptability on ICT Integration in Teaching among Secondary School Teachers

An ordinal regression analysis was conducted to examine the relationship between adaptability and the integration of Information and Communication Technology (ICT) in teaching practices.

Table. 5 Adaptability as a Predictor of ICT Integration in Teaching

Model	**-2 Log Likelihood**	**Chi-Square**	**df**	**Sig.**
Intercept Only	109.618			
Final	94.081	15.537	3	.001

Link function: Logit.

Table 5 indicated that the Final model demonstrated a significantly better fit to the data compared to the Intercept Only model. This was evidenced by a lower -2 Log Likelihood ($\chi^2 = 94.081$) and a significant chi-square value ($\chi^2 = 15.537$, df = 3, p = .001). The significance level (p = .001) suggests that the improvement in model fit is statistically significant.

3.7 Influence of Continuous Learning on ICT Integration in Teaching among Secondary School Teachers

Table. 6 Continuous Learning as a Predictor of ICT Integration in Teaching

Model	**-2 Log Likelihood**	**Chi-Square**	**df**	**Sig.**
Intercept Only	108.496			
Final	15.090	93.406	3	.000

Link function: Logit.

Table 6 indicated a significant improvement in model fit for the Final model compared to the Intercept Only model. Specifically, the Final model exhibited a substantially lower -2 Log Likelihood ($\chi^2 = 15.090$) and a significant chi-square value ($\chi^2 = 93.406$, df = 3, p = .000). The significance level (p = .000) suggests that the improvement in model fit is statistically significant.

3.8 Resilience and persistence as a Predictor ICT Integration in Teaching among Secondary School Teachers

An ordinal regression analysis was conducted to explore the influence of resilience and persistence on the integration of Information and Communication Technology (ICT) in teaching practices.

Table. 7 Resilience and Persistence as a Predictor of ICT Integration in Teaching

Model	**-2 Log Likelihood**	**Chi-Square**	**df**	**Sig.**
Intercept Only	105.215			
Final	94.251	10.964	2	.004

Link function: Logit.

Table 7 revealed that the final model demonstrated a statistically significant improvement in fit compared to the Intercept Only model. This was evidenced by a lower -2 Log Likelihood ($\chi^2 = 94.251$) and a significant chi-square value ($\chi^2 = 10.964$, df = 2, p = .004). The significance level (p = .004) indicates that the improvement in model fit is statistically significant.

4. Discussions

The study sought to investigate the impact of teachers' personal characteristics which included: self-efficacy, attituded, creativity, problem-solving, adaptability, continuous learning and resilience on the integration of Information and Communication Technology (ICT) in pedagogical practices among secondary school teachers. Through an ordinal regression analysis, the predictive relationship between the characteristics and ICT integration was examined. The results demonstrated notable findings,

The predictive relationship between self-efficacy in ICT use and ICT integration was examined. The results demonstrated notable findings, as summarized in Table 1. The

comparison between the intercept-only and final models exhibited a chi-square value of 16.128 with 3 degrees of freedom (df), attaining statistical significance ($\chi^2(3) = 16.128$, $p = .001$). Consequently, the null hypothesis was rejected, and it was concluded that self-efficacy is a significant predictor of ICT integration in teaching practices among secondary school teachers. The finding agrees with Afari, et al. (2023) study which explored the association between different aspects of computer self-efficacy (basic technology skills, advanced technology skills, and technology for pedagogy) and pre-service teachers' intentions to use technology. By examining these relationships through confirmatory factor analysis and structural equation modeling, the study provided empirical evidence for the predictive role of computer self-efficacy in determining teachers' intentions to use technology in their teaching.

Furthermore, the study investigated the influence of attitude towards ICT use on the level of ICT integration in teaching practices among secondary school educators. Through ordinal regression analysis, the predictive nature of attitude towards ICT use was examined, revealing significant results as presented in Table 2. The comparison between the intercept-only and final models yielded a chi-square value of 7.981 with 2 degrees of freedom (df), reaching statistical significance ($\chi^2(2) = 7.981$, $p = .018$). Thus, the null hypothesis was rejected, indicating that attitude towards ICT was a significant factor influencing the utilization of ICT tools in teaching practices among secondary school teachers.

Regarding creativity and innovation, the final model significantly outperformed the intercept-only model, indicating that creativity and innovation are substantial predictors of ICT integration in teaching ($\chi^2 = 17.430$, $df = 2$, $p < .001$). Thus, rejecting the null hypothesis, it is evident that creativity and innovation positively influence the incorporation of ICT tools into pedagogical methods. This finding is in agreement with the research conducted by Guillén-Gámez, Ruiz-Palmero, and Gómez-García (2023), which among other things suggested that teachers with higher levels of creativity and openness to innovation tend to have better digital competences, especially in research contexts.

Conversely, problem-solving orientation did not significantly enhance the fit of the model, as indicated by a non-significant difference between the initial and final models ($\chi^2 = 1.465$, $df = 2$, $p = .481$). Accordingly, the null hypothesis was accepted, suggesting that problem-solving orientation among teachers does not notably impact the utilization of ICT tools in teaching practices.

Similarly, adaptability demonstrated a significant relationship with ICT integration in teaching, as evidenced by a lower -2 Log Likelihood and a significant chi-square value ($\chi^2 = 15.537$, $df = 3$, $p = .001$), leading to the rejection of the null hypothesis. These findings highlight the importance of adaptability as a predictor of ICT integration in teaching practices. Teachers who demonstrate higher levels of adaptability may be more likely to effectively integrate ICT into their teaching methods. The findings seem to concur with the findings from a study by Mardiana(2020) which suggested that, lecturers' adaptability to technological change positively influences their use of ICT tools in teaching, as demonstrated by their readiness to adopt online teaching methods and engage in learning advanced techniques to

enhance their teaching practices in the digital age. Although the study by Mardiana (2020) targeted university lecturers, adaptability appear to be a good predictor of utilizing ICT tools in teaching as well among secondary school teachers.

Continuous learning also emerged as a significant predictor, with a substantial improvement in model fit compared to the intercept-only model ($\chi^2 = 93.406$, df = 3, p = .000). Therefore, rejecting the null hypothesis, continuous learning is identified as a crucial characteristic associated with effective ICT integration in teaching practices.

Lastly, resilience and persistence were found to be significant predictors of ICT integration in teaching practices, with the final model exhibiting a statistically significant improvement over the intercept-only model ($\chi^2 = 10.964$, df = 2, p = .004). Thus, rejecting the null hypothesis, resilience and persistence are highlighted as important attributes contributing to the successful incorporation of ICT tools in educational settings.

5. Conclusion

This study delved into the influence of various personal characteristics of secondary school teachers on the integration of Information and Communication Technology (ICT) in pedagogical practices. Through ordinal regression analysis, the predictive relationships between these characteristics and ICT integration were examined. Notable findings emerged, shedding light on the nuanced interplay between personal traits and the adoption of ICT in educational settings.

Firstly, the investigation revealed that self-efficacy in ICT use significantly predicts ICT integration in teaching practices among secondary school teachers. This finding aligns with existing research, emphasizing the pivotal role of self-efficacy in fostering technology integration in education. Similarly, attitude towards ICT use emerged as a significant factor influencing the utilization of ICT tools in teaching practices, further underscoring the importance of teachers' perceptions and beliefs in shaping their instructional approaches.

Moreover, creativity and innovation were identified as substantial predictors of ICT integration in teaching, echoing previous studies suggesting that teachers with higher levels of creativity and openness to innovation tend to exhibit better digital competences. Conversely, while problem-solving orientation did not significantly enhance model fit, adaptability emerged as a crucial predictor of effective ICT integration, highlighting the importance of teachers' ability to adapt to technological change and embrace innovative teaching methods.

Additionally, continuous learning was identified as a critical characteristic associated with effective ICT integration in teaching practices, emphasizing the significance of ongoing professional development in fostering digital literacy among educators. Lastly, resilience and persistence were found to be significant predictors of ICT integration, indicating the importance of perseverance in overcoming challenges and embracing technology-enhanced teaching approaches.

This study underscores the multifaceted nature of factors influencing the integration of ICT in teaching practices among secondary school teachers. While self-efficacy, attitude, creativity, adaptability, continuous learning, and resilience and persistence emerged as significant predictors, it is essential to recognize the complex interplay between these personal characteristics and their collective impact on teachers' readiness to embrace technology in educational settings. These findings carry implications for teacher training programs and professional development initiatives aimed at equipping teachers with the necessary skills to effectively integrate ICT into their pedagogical practices.

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