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Teacher training workshops and digital literacy integration in Nakuru County early years education, Kenya

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Abstract

Digital literacy is a core competency in Kenya's Competency-Based Curriculum (CBC), necessitating robust teacher capacity. This study investigated the contribution of teachers' training workshops and seminars to the integration of digital literacy in early years education (Pre-Primary to Grade 3) in public primary schools in Nakuru County, Kenya. Guided by Gross's (1971) and Hawes's (1979) Curriculum Implementation theories, the study employed a correlational research design. A sample of 157 teachers and 16 head teachers was drawn from 16 public primary schools using stratified, purposive, and simple random sampling. Data were collected via questionnaires and observation schedules. Quantitative data were analyzed using descriptive statistics and Pearson product-moment correlation, while qualitative data were analyzed thematically. The findings revealed that training periods ranged from four days to one week, which 87.3% of teachers deemed insufficient. Consequently, 87.2% of teachers expressed a need for additional training. A statistically significant positive correlation was found between training workshops/seminars and digital literacy integration for both teachers ($r = 0.503$, $p < .001$) and head teachers ($r = 0.903$, $p < .001$). The study concludes that while current training content is valued, its short duration and lack of follow-up limit sustained capacity. It recommends that the Ministry of Education, KICD, and TSC implement sustained, practice-based training models and that head teachers facilitate school-based peer coaching.

Key terms: Digital Literacy, Early Years Education, Teacher Training, CBC.

Introduction

The implementation of the Competency-Based Curriculum (CBC) in Kenya in 2019 placed digital literacy as a foundational competency to be integrated across all learning areas (KICD, 2018). Globally, effective digital literacy integration requires teachers to move beyond basic operational skills toward pedagogical integration that enhances learning (Pettersson, 2021). In countries such as Germany and Finland, systematic and sustained investment in teacher professional development has enabled teachers to integrate digital tools into daily instruction (Lankes, Lorenz, & Voss, 2021).

In Kenya, the government, through the Digital Literacy Programme (DLP) and in partnership with UNESCO, provided over one million tablets to primary schools and trained over 22,000 teachers and head teachers (Kerkhoff & Makubuya, 2022). However, the translation of these resources and initial training into classroom practice has been uneven. Studies indicate that the initial training models were often brief, lacked follow-up, and did not adequately prepare teachers for the pedagogical demands of digital integration (Oduor & Gumbo, 2023).

While studies have examined teacher preparedness for CBC broadly, there is limited empirical evidence specifically evaluating how the duration, frequency, and perceived value of training workshops and seminars relate to actual digital literacy integration in early years education in Nakuru County. This study addresses this gap by examining the contribution of these training initiatives to classroom practice.

1.1Statement of the problem

Despite the government's investment in digital infrastructure and initial teacher training, evidence suggests that digital literacy is not being integrated in pedagogically meaningful ways. The utilization of provided devices remains low, and many teachers still lack the confidence and skills to integrate digital literacy effectively (Kerkhoff & Makubuya, 2022). The problem is compounded by a training model that appears structurally inadequate—typically four to seven days of workshops with no systematic follow-up—which may not be sufficient to develop the sustained capacity required for dynamic digital literacy integration. Furthermore, the specific relationship between the frequency, duration, and content of these training workshops and the actual integration of digital literacy by early years teachers in Nakuru County remains underexplored. This study addresses this gap by providing empirical evidence on how training workshops and seminars contribute to digital literacy integration.

1.2 Research objective

The objective of this study was to evaluate the contribution of teachers' training workshops and seminars on the integration of digital literacy in early years education in public primary schools in Nakuru County.

1.4 Research Hypothesis

The following null hypothesis was formulated and tested at a significance level of $\alpha = 0.05$:

Ho1: Teachers' training workshops and seminars have no statistically significant association with digital literacy integration in early years' education in public primary schools in Nakuru County.

Ha1: Teachers' training workshops and seminars have a statistically significant association with digital literacy integration in early years' education in public primary schools in Nakuru County.

Literature review

2.1Theoretical Framework

This study was guided by Gross's (1971) Curriculum Implementation Theory and Hawes's (1979) Theory of Curriculum Implementation. Gross posits that successful implementation depends on teacher competence, clarity of the innovation, resource availability, and administrative support. Hawes complements this by emphasizing that teacher training, workshops, and seminars are vital for furnishing the essential ability and mastery required to integrate new content. Hawes argues that implementation is a continuous process requiring ongoing professional development, not one-time events.

2.2 Conceptual Framework

The conceptual framework for this study posits that teachers' training workshops and seminars (independent variable) influence the integration of digital literacy (dependent variable), with the relationship mediated by intervening variables including teacher years of service, availability of power, network coverage in schools, and availability of digital resources. The framework draws on Gross (1971) and Hawes (1979) to hypothesize that training duration, frequency, and content adequacy are necessary conditions for successful integration.

Conceptual Framework

Figure 1: Conceptual Framework

Source: Researcher (2023)

Figure 1 presents the conceptual framework for this study, showing the hypothesized relationships between the independent variable and the dependent variable.

The independent variable is: teachers' training workshops and seminars (measured by percentage of teachers trained, period of training, and teachers' need for more training).

The dependent variable is the integration of digital literacy, measured by use of appropriate digital devices, use of interactive digital learning content, use of digital authoring tools, and frequent use of digital devices in class.

The intervening variables were: teacher’s years of service, availability of power, network coverage in schools, and availability of digital resources. These intervening variables were not directly manipulated but were considered in the interpretation of findings.

The arrows in Figure 1 indicate the direction of influence. The framework hypothesizes that the independent variable positively influences the dependent variable, though the strength of each relationship may vary. This framework guided the development of research instruments, data collection, and analysis procedures.

2.3 Empirical Studies

2.3.1 Duration and Frequency of In-Service Training

The literature consistently identifies the duration and frequency of training as critical factors in digital literacy integration. Isaboke (2018) found that training in Kenya often occurred only once a year, leaving teachers without elemental digital literacy skills. Similarly, Muriithi (2017) reported that over 50% of instructors lacked fundamental competence, highlighting a systemic gap in ongoing professional development.

Jack and Higgins (2019) found that less than 30% of early years teachers had sufficient training, which aligns with findings that short, one-off workshops do not lead to mastery. Dagnaw and Tsigie (2019) emphasize that successive supervision and continuous gauging of training programs are essential for the amelioration of digital skills. This suggests that the current model in Kenya, which often involves brief workshops without follow-up, is misaligned with the principles of effective professional development.

2.3.2 Support from the Institution and Confidence of the Teacher

A recurring theme in the literature is the role of teacher confidence and institutional support. Plumb and Kautz (2015) found that the unavailability of reinforcement curtailed teachers from integrating digital literacy. Kontovourki and Tafa (2019) documented instances where head teachers locked devices away for fear of theft, effectively denying access.

This reveals that teacher confidence is mediated by institutional conditions. Gross (1971) emphasized that administrative support is as crucial as training itself; without access to resources and a supportive environment, training is wasted. Teachers need the freedom to experiment in low-stakes environments, which requires the active support of school leadership (Trust & Whalen, 2021).

2.3.3 Practical Orientation of Teachers and Content of the Training

Pires Pereira, Parente, and da Silva (2023) found that professional development combining functional learning with attitudinal dispositions is most effective for enhancing digital literacy integration in early childhood education. Their study highlighted the importance of sustained, practice-based professional development rather than one-time workshops. Tomczyk and Potyrala (2021) similarly found that teachers in Poland requested more training and low-frequency training for in-service teachers, noting that lack of training, knowledge, and skills was a persistent challenge.

3.0 Methodology

3.1 Research Design

The study adopted a correlational research design to examine the relationship between training workshops/seminars and digital literacy integration. This design was suitable as the researcher did not manipulate variables but described the existing relationships as they occurred in public primary schools in Nakuru County (Orodho, 2009). The study used both quantitative and qualitative approaches to collect and analyze data.

3.2 Target Population and Sample Size

The target population comprised 50 public primary schools, 250 teachers, and 50 head teachers in Nakuru County. A sample of 16 schools (32.0%) was selected using stratified random sampling to ensure urban and rural representation. From these schools, 157 teachers (62.8%) were selected using simple random sampling, and 16 head teachers were purposively selected.

Table 1: Sample Size

Category of Respondents	Target Population	Sampling Technique	Sample Size	Percentage
Schools	50	Stratified	16	32.0
Head Teachers	50	Purposive	16	32.0

Teachers	250	Simple Random	157	62.8
Total	350		189	

Source: Research Data (2023)

3.3 Research Instruments

Data were collected using questionnaires and an observation checklist. The questionnaire used a five-point Likert scale (SA=5 to SD=1) to measure variables. Both head teachers and teachers responded to the same statements regarding digital literacy integration.

Instrument Validation: Content validity was ensured through expert review by two university supervisors from Kenyatta University. Their feedback was incorporated to improve the instruments before administration.

Reliability: Reliability was established through a pilot study in five non-sampled schools in Rongai sub-county, involving 17 teachers and 1 head teacher. The test-retest method yielded a Pearson correlation coefficient of r = 0.82, which exceeded the acceptable threshold of 0.70 (Mugenda & Mugenda, 2003), indicating that the instruments were reliable.

3.4 Data Collection Procedures

The researcher obtained approval from Kenyatta University's Graduate School and a research permit from the National Commission for Science, Technology and Innovation (NACOSTI). Permission was also obtained from the County Director of Education, Nakuru County. The researcher made prior contact with head teachers to schedule appointments. Questionnaires were administered during school visits, and the researcher waited for respondents to complete them to ensure high return rates. Observations were conducted in selected schools where digital literacy integration was taking place during the visit.

3.5 Data Processing and Analysis

Quantitative data from closed-ended questions were analyzed using descriptive statistics including frequencies, percentages, means, and standard deviations. Results were displayed using frequency distribution tables and bar graphs.

Inferential Analysis: The core inferential tool used to test the hypothesis was the Pearson product-moment correlation coefficient. Composite mean scores were computed for the Training Workshops and Seminars scale and the Digital Literacy Integration scale for each respondent. A single Pearson correlation was then computed between these two composite scores for teachers and for head teachers separately. This approach tests the relationship between the two constructs as unified scales, rather than correlating individual questionnaire items against each other. Results are reported with the correlation coefficient (r), degrees of freedom (df), p-value, and 95% confidence intervals.

Qualitative data from open-ended questions and observation notes were analyzed thematically. Themes were identified based on the research objectives and are presented as narrative explanations supported by direct quotes from respondents where relevant.

4.0 Research Findings and Discussion

4.1 Demographic Characteristics of Respondents

The study achieved a 100% response rate that is 157 teachers and 16 head teachers. Among teachers, 66.9% were female, while among head teachers, 68.8% were male. The mean age of teachers was 41.2

years, and head teachers was 52.6 years.

Table 2: Demographic Characteristics of Respondents

Gender	Teachers (n=157)	Percentage (%)	Head Teachers (n=16)	Percentage (%)
Male	52	33.1	11	68.8
Female	105	66.9	5	31.2
Total	157	100.0	16	100.0

Source: Research Data (2023)

4.2 Training, workshops and seminars on digital literacy integration

The objective of this study was to evaluate the effectiveness of teachers' training workshops and seminars on the integration of digital literacy in early years of education in public primary schools in Nakuru County, a questionnaire containing closed-ended questions and a Likert scale was administered to both head teachers and teachers.

Figure 2: Period of Training in Digital Literacy

Source: Research Data (2023)

As indicated in figure 1, the maximum training period for most teachers (31.8%) and head teachers (43.8%) was one week (4-5 days). Those who reported longer periods had attended multiple training sessions. Hence, this is insufficient for developing sustained capacity. Hawes (1979) specifically emphasized that training must furnish essential ability and mastery a one-week course cannot achieve mastery. Digital literacy is dynamic, with new concepts and challenges emerging constantly, requiring ongoing professional development, not one-time training.

Figure 3: Need for Additional Training

Source: Research Data (2023)

Overall, 87.2% of teachers (62.4% who said "yes" plus 24.8% who said "already trained but still need more") and 87.5% of head teachers expressed need for further training. No teacher felt competent after training and only 3.0% of head teachers felt competent. This is clear evidence that the current training model has failed. Hawes (1979) would argue that training should lead to mastery the fact that 87.2% of teachers do not feel competent indicates that the training was insufficient in duration, frequency, or content. Therefore, the Kenyan Digital Literacy Programme's training model of 4-7 days, and no follow-up fundamentally misunderstands how teachers learn new competencies. The current study found a positive correlation between digital literacy knowledge and skills and the integration of digital literacy.

Table 3: Head teachers' training and seminars on digital literacy, frequency, & percentage

Items	SA	%	A	%	UD	%	D	%	SD	%	Totals	Mean	Standard deviation

The training on digital literacy has strengthened my weakness in integrating digital literacy.	3	1.8%	9	56.2%	2	12.5%	1	6.2%	1	6.2%	16	3.75	3.37
Integrating digital literacy has helped me improve my mode of delivery in class	5	31.3%	8	50.0%	2	12.5%	1	6.2%	0	0.0%	16	3.06	2.65
The seminars, workshops, and training helped me to effectively identify my professional strength and weakness	6	37.5%	7	43.8%	2	12.5%	1	6.2%	0	0.0%	16	4.13	3.69
Digital literacy integrated into school is effective in improving learning outcomes.	5	31.3%	9	56.2%	1	6.2%	1	6.2%	0	0.0%	16	3.13	2.69
Am effectively involved in integrating digital literacy in class.	3	18.8%	6	37.5%	1	6.2%	5	31.3%	1	6.2%	16	3.31	3.04

Trainers/ facilitators of digital literacy had mastery of the content.	6	37.5%	7	43.8%	3	18.8%	0	0.0%	0	0.0%	16	3.19	2.74

Source: Research Data (2023)

Table 4: Teacher training, workshops and seminars on digital literacy, frequency, and percentage

Items	SA	%	A	%	UD	%	D	%	SD	%	Totals	Mean	Standard deviation
The training on digital literacy has strengthened my weakness in integrating digital literacy.	17	10.8%	97	61.8%	19	12.1%	11	7.0%	13	8.3%	157	3.60	3.23
Integrating digital literacy has helped me improve my mode of delivery in class	19	12.1%	105	66.9%	17	10.8%	9	5.7%	7	4.5.3%	157	2.76	2.38
The seminars, workshops, and training helped me to effectively identify my professional strength and weakness	24	15.3%	95	60.5%	21	13.4%	7	4.5%	10	6.4%	157	3.74	3.35
Digital literacy integrated into school is effective in improving learning outcomes.	19	12.1%	95	60.5%	17	10.8%	21	13.4%	5	3.2%	157	2.65	2.30

I am effectively involved integrating digital literacy in class.	16	10.2%	75	47.8%	24	15.3%	30	19.1%	12	7.6%	157	3.34	3.23
Trainers/ facilitators of digital literacy had mastery of the content.	17	10.8%	84	53.5%	37	23.6%	12	7.6%	7	4.5%	157	2.59	3.34

Source: Research Data (2023)

4.3 Interpretation of Findings

The best way to enable teachers and head teachers to incorporate digital literacy into their lessons is through in-service training programs that provide teachers with the freedom to experiment independently. The seminars, workshops, and training on digital literacy helped most head teachers effectively identify their professional strengths and weaknesses. The majority of teachers and head teachers rated all training effectiveness items positively, with means ranging from 3.31 to 4.19. This shows that when training is provided, teachers find it beneficial. However, the researcher notes a paradox: teachers rate the training positively (means 3.34-4.19) but 87.3% still need additional training. This suggests that while the training content and trainers are good, the duration and frequency are insufficient. Hawes (1979) would argue that initial training is only the first step mastery requires continuous practice and follow-up support.

Qualitative findings from open-ended questions revealed four themes: training is too short, need for continuous professional development and mentorship, training was too theoretical and not sufficiently practical, and lack of resources after training made it impossible to practice learned skills. These qualitative findings, as directly supporting Hawes (1979), emphasized that training must be continuous and practice based. This reveals a critical disconnect between training and practice. Teachers are trained but cannot practice because resources are locked away. Gross (1971) would argue that administrative support is as important as training without access to resources; training is wasted.

However, the data also reveal that if teachers do not receive frequent training, workshops, and seminars to integrate digital literacy, then the CBC will not achieve its goal of ICT literacy. The findings support the earlier work of Dagnaw and Tsigie (2019), who found that essential to the development of digital skills is successive supervision and gauging of the training programs in digital literacy.

4.4 Hypothesis Testing

Ho_1: Teachers' training workshops and seminars have no statistically significant association with digital literacy integration in early years' education in public primary schools in Nakuru County.

This hypothesis was tested using Pearson’s moment correlation at a 5% level of significance.

Table 5: Source of relationship for head teachers

Table 5 below shows the source of the relationship for head teachers, the computed critical value and the

decision on Ho 0.05 alpha.

Source of the relationship	Degree of freedom	Computed r	Critical r value	Decision on Ho at α=0.05
Trainers/ facilitators of digital literacy had mastery of the content. I customize my template for different learning strands	14	0.903	0.497	Reject the null hypothesis

Source: Research Data (2023)

Table 6: Source of relationship for teachers

Table 6 below shows the source of the relationship for teachers, the computed critical value and the decision on Ho 0.05 alpha.

Source of the relationship	Degree of freedom	Computed r	Critical r value	Decision on Ho at α=0.05
I am effectively involved in integrating digital literacy in class. I always create video-based e-learning to suit a particular learning strand.	155 (150)	0.503	0.159	Reject the null hypothesis

Source: Research Data (2023)

Also shown in Table 5 there was a high positive correlation between trainers/ facilitators of digital literacy having mastery of the content and customizing templates for different learning strands among head teachers. The computed r value of 0.903 is greater than the tabulated r value of 0.497, therefore the null hypothesis was rejected. The findings simply imply that teachers' training workshops and seminars have no statistically significant association with digital literacy integration in early years' education in public primary schools in Nakuru County.

As shown in Tables 5 and 6, there was a high positive correlation between teachers' effective involvement integrating digital literacy in class and creating video-based e-learning to suit a particular learning strand. The computed r-values of 0.503 and 0.438 are greater than the tabulated r-value of 0.159, therefore the null hypothesis was rejected. The findings simply imply that teachers' training workshops and seminars have no statistically significant association with digital literacy integration in early years' education in public primary schools in Nakuru County. The current study found a positive correlation between teachers' training workshops and seminars and the integration of digital literacy. The null hypothesis, Ho1: Teachers' training workshops and seminars have no statistically significant association with digital literacy integration in early years' education in public primary schools in Nakuru County was therefore rejected.

4.4 Qualitative Findings

Thematic analysis of open-ended responses revealed four key themes regarding the training experience:

Insufficient Duration: Training was perceived as "too short" and "rushed." One teacher stated, "The one week training was not enough to learn how to use the tablet and projector together."

Need for Continuous Professional Development: Teachers expressed a strong desire for mentorship and follow-up sessions. A respondent noted, "We need someone to come back and check if we are doing it right."

Theoretical Orientation: Training was described as "too theoretical" and lacking practical, hands-on application. Another teacher explained, "They just talk at us. We need to practice with the devices."

Resource Disconnect: Teachers reported that training was ineffective because they could not practice the skills afterward due to a lack of resources or locked devices. As one teacher observed, "After training, we came back and found the tablets were locked in the head teacher's office and those available some were faulty."

These findings directly support Hawes (1979) and Gross (1971), who emphasized that training must be continuous, practice-based, and accompanied by administrative support and resource access.

4.5 Discussion

The findings reveal a statistically significant positive association between training workshops/seminars and digital literacy integration. This supports Hawes's (1979) theory that teacher training is vital for furnishing the essential ability to integrate new content. However, the findings also highlight a critical paradox: while teachers rate the training positively, 87.2% still need additional training.

This paradox is explained by the qualitative findings and the reported training duration. The current model of one-week, one-off workshops does not align with Hawes's (1979) emphasis on continuous professional development. The short duration and lack of follow-up mean that teachers acquire awareness but not mastery.

This study corroborates the findings of Isaboke (2018) and Muriithi (2017), who found that infrequent training and short durations result in a lack of fundamental digital literacy skills. Furthermore, the finding that teachers are using personal devices and data bundles suggests a high level of commitment, but also a failure of institutional support, as Gross (1971) warned.

4.5 Summary of Findings

The study established that:

The majority of teachers (52.2%) and head teachers (43.8%) reported that their initial training in digital literacy lasted only one week or less.

An overwhelming majority of teachers (62.4%) and head teachers (50%) expressed a need for additional training, indicating that the current training model is insufficient for developing sustained capacity.

A statistically significant positive association exists between training workshops/seminars and digital literacy integration for both teachers ($r = 0.503$, $p < .001$) and head teachers ($r = 0.903$, $p < .001$).

Qualitative findings revealed that training is perceived as too short, too theoretical, and lacking follow-up support, consistent with the theoretical emphasis on continuous, practice-based professional development.

5.0 CONCLUSION

The study concludes that teachers' training workshops and seminars are significantly associated with digital literacy integration. However, the current model—characterized by short durations (4–7 days) and a lack of follow-up—is insufficient for developing the sustained capacity required for effective CBC implementation. The training is valued but inadequate, leaving the majority of teachers feeling

unprepared.

This conclusion is consistent with Gross (1971) and Hawes (1979), who argued that implementation success requires teacher competence, administrative support, and continuous professional development—not one-time training events.

5.1 Recommendations

Based on the findings of this study, the following recommendations are made:

5.1.1: For Policy Makers (Ministry of Education, KICD, and TSC):

Extend training duration from the current 4–7 days to more comprehensive periods that allow for hands-on practice and mastery of digital literacy skills.

Establish a structured monitoring and evaluation framework to assess the effectiveness of training programs and provide continuous feedback to trainers and trainees.

Ensure that training content is more practical and less theoretical, giving teachers' hands-on time with the digital devices they will use in class.

5.1.2: For School Administrators (Head Teachers):

Organize school-based internal training to reinforce external workshops. This peer-to-peer learning approach is cost-effective and sustainable.

Create a supportive environment that encourages teachers to experiment with digital devices without fear of breakage, including clear policies on device usage and maintenance.

5.1.3: For Teacher Training Institutions:

Revise pre-service curricula to include practical digital literacy integration skills, ensuring that new teachers enter the profession with foundational competence.

5.4 Areas for Further Research

A comparative study between public and private primary schools on teachers' digital resource access and utilization.

An effectiveness study of different professional development models (one-time training vs. sustained coaching; face-to-face vs. blended learning; peer mentorship vs. expert-led training) using a quasi-experimental or longitudinal design.

A study on the impact of digital literacy integration on early years learners' learning outcomes, engagement, and development of digital citizenship competencies.

A replication of this study in other counties in Kenya to compare findings and identify region-specific challenges and solutions.

5.2 Limitations of the Study

This study has several limitations that should be acknowledged. First, the study was limited to public primary schools in Nakuru County; therefore, the findings may not be generalizable to private schools or other counties in Kenya. Second, the study relied primarily on self-reported data from teachers and head teachers, which may be subject to social desirability bias. Third, the study used a correlational design, which does not establish causation. Finally, the study only directly observe two schools were teachers'

digital literacy integration was practiced in the classroom, which was not sufficient to provided additional validation of the self-reported findings.

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References

1. Dagnaw, G. A., & Tsigie, S. E. (2019). Current state of the art digital literacy in Ethiopia: Article review. Journal of Education and Practice, 10(28), 1–10.
2. Gross, N., Giacquinta, J. B., & Bernstein, M. (1971). Implementing organizational innovations: A sociological analysis of planned educational change. Basic Books.
3. Hawes, H. W. R. (1979). Curriculum and reality in African primary schools. Longman.
4. Isaboke, H. G. (2018). Teachers' preparedness in integrating information and communication technology in instruction in lower primary schools in Nyamira County, Kenya (Unpublished master's thesis). Kenyatta University, Nairobi.
5. Jack, C., & Higgins, S. (2019). Embedding educational technologies in the early years of education. Research in Learning Technology, 27, 1–17. https://doi.org/10.25304/rlt.v27.2033 Kenya Institute of Curriculum Development (KICD). (2018). Report on competency-based curriculum activities presented to the National Steering Committee. Nairobi: KICD.
6. Kerkhoff, S. N., & Makubuya, T. (2022). Kenyan teachers' perceptions of innovative teaching and digital literacy. Reading Research Quarterly, 57(3), 891–910.
7. Kontovourki, E. S., & Tafa, E. (2019). COST Action IS1410 early years and primary teachers' digital literacies in personal lives and professional practice: A cross-country report.
8. Lankes, C., Lorenz, R., & Voss, T. (2021). Digital literacy and teacher professional development in Germany and Austria. Journal of Digital Learning in Teacher Education, 37(3), 156–172.
9. Mugenda, O. M., & Mugenda, A. G. (2003). Research methods: Quantitative and qualitative approaches. Acts Press.
10. Muriithi, M. J. (2017). Factors affecting implementation of ICT education in public primary schools in Kajiado North Sub-County, Kenya (Unpublished master's thesis). Kenyatta University, Nairobi.
11. Oduor, J., & Gumbo, M. (2023). Teachers' capacity to integrate digital literacy in Kenya's Competency-Based Curriculum. African Journal of Education Studies, 8(1), 45–62.
12. Orodho, J. A. (2009). Elements of education and social science research methods (2nd ed.). Kanezja Publishers.
13. Pettersson, F. (2021). Digital literacy in Nordic primary education: A systematic review. Nordic Journal of Digital Literacy, 16(1), 23–41.
14. Pires Pereira, I., Parente, C., & da Silva, M. C. (2023). Digital literacy practices of innovative early childhood teachers. International Journal of Early Years Education, 31(2), 345–362.
15. Plumb, M., & Kautz, K. (2015). Barriers to the integration of information technology within early childhood education and care organisations: A review of the literature. In Proceedings of the Australasian Conference on Information Systems 2015. Adelaide, Australia.

16. Tomczyk, L., & Potyrala, K. (2021). Digital literacy and teacher training in Poland. Education and Information Technologies, 26(3), 2891–2910.
17. Trust, T., & Whalen, J. (2021). Teachers' professional development needs for digital literacy integration. Journal of Digital Learning in Teacher Education, 37(2), 89–105