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Research Article

Relationship Between Digital Competence and Language Instruction Among Ecde Teachers in Upper Eastern, Kenya Based on Their Personal Characteristics

Moses Ouma Oyieno*, Hannah Kangara, John Ogembo, Monica Ituma

Department of Education, Chuka University, Chuka, Kenya
Emails: moyieno@chuka.ac.ke; hkangara@chuka.ac.ke; jogembo@chuka.ac.ke; mituma@chuka.ac.ke

Abstract

Early Childhood Development and Education (ECDE) teachers' digital competence is crucial in the integration of learning of children in the ECDE Units which requires availability and utilization of digital resources in the instructional process. The study aimed to establish the relationship between digital competence and language instruction among ECDE teachers based on their personal characteristics. Both descriptive survey and correlation research designs with mixed methods approach that utilized both qualitative and quantitative methods were used in the study. From a population of 4,021, a sample of 365 was obtained comprising of 181 language teachers, 181 head teachers and 3 ECDE County Directors. The data was obtained from 339 a response rate of 93.15%. Simple random sampling was used to in selecting a sample of ECDE teachers, head teachers while the ECDE County Directors were purposively selected. Data was analyzed using descriptive and inferential statistics with the help of Statistical Packages for Social Sciences (SPSS) version 27.0 computer software. Frequencies and percentages were used to describe the existing relationship between study variables while hypothesis was tested using logistic regression at 95% level of significance. The study assessed teachers' digital competence in language instruction based on age, gender, education level, and experience, finding that younger teachers are generally more proficient and open to using digital tools, while male teachers show enthusiasm for digital training; education level correlates positively with digital competence, and teaching experience, though significant, may not always predict better digital tool usage. The study recommended that age of ECDE teachers was not a significant predictor, capacity building should focus more on older teachers who might benefit from age-specific training that addresses potential gaps in digital skills. Gender, level of education and teachers experience should also be taken into account.

Keywords

ECDE Teachers' Digital Competence, Language Instruction, Digital Resources, Personal Characteristics, Age, Gender, Education Level, Experience

1. Introduction

Mastery of language literacy involves a multifaceted process encompassing various concepts and mechanisms. Existing literature underscores the absence of a single direct method for acquiring language literacy [9]. Consequently, instruction of language to children necessitates a well-planned approach to attain desired outcomes. A study observed that

*Corresponding author: moyieno@chuka.ac.ke (Moses Ouma Oyieno)

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language acquisition can occur through interaction and observation of knowledgeable figures, like teachers or parents, who hold significance to the child [3]. Such interactions lead the child to imitate these influential individuals (caregivers), thereby acquiring the essential language skills and achieving mastery. This highlights the pivotal role adults play in aiding children's language acquisition.

Another study proposed that children become adept at recognizing and communicating when immersed in a language-rich environment, while also being responsive to caregivers' attempts to engage them in communication [5]. This underscores the importance of a solid language literacy foundation in early years, facilitating a seamless transition between home and school and subsequently impacting language literacy success. This can manifest in a child's interaction with peers, their ability to follow directions and narratives, and their auditory perception, among other aspects [13]. According to researchers, children exposed to rich language and literacy experiences are more likely to excel in independent learning. As a result, it is imperative to employ effective strategies to offer ECDE children the necessary language mastery approaches and experiences, achieved through the provision of suitable resources within their environment. The purpose of the study was to investigate the relationship between digital competence and language instruction among ECDE teachers with the objective to establish the relationship between digital competence and language instruction among ECDE teachers in Upper Eastern, Kenya based on their personal characteristics. The study is significant to the Ministry of Education who may design targeted a professional development program to enhance digital competence of ECDE teachers and language instruction based on varied teachers' characteristics. These programs can be aligned with the specific needs as identified in the study. The study's results can contribute to the integration of digital literacy components into the curriculum for Early Childhood Education. The Ministry can work on updating the curriculum to ensure that it reflects the importance of digital competence to the ECDE teachers in instruction of language in modern education with consideration of their characteristics.

The age of the teacher can impact their digital competence during instruction. A study found out that factors such as age and gender can influence the prediction of teachers' pedagogical knowledge [14]. However, the specific educational level at which the teachers instruct does not impact prediction. This implies that age is not the only factor at play on matters regards to their digital competence. Digital competence pertains to a teacher's proficiency in utilizing technology and digital tools in the classroom to enrich the learning experience for students. Similar research findings emphasized that teachers who are younger might be more at ease and familiar with the use of digital tools, having been exposed to technology for most of their lives [2]. Yet, this doesn't exclude older teachers, who also demonstrate a high level of technological proficiency and keenly adopt technology if they possess the motivation to learn and adjust. This implies that a young teacher can be able to manipulate digital tools effectively and efficiently than the older teachers. Nevertheless, teachers of a more advanced age may also show adeptness in technology and eagerly embrace digital tools if they show willingness and enthusiasm to learn and adjust, sufficient professional development, attitude and mindset, availability of the digital resources to the teachers for use, and experience may also boost elder teachers in confident use of digital resources thereby improving their competence.

Teachers' gender, just like age can slightly affect the level of digital competence during instruction, yet it is not exclusive determinant since digital competence solely relies on the proficiency to utilize digital resources in instructional process [8]. While gender may exert some influence on their digital competence, it is not the only driving factor. Other elements like societal norms, accessibility and opportunities, personal motivation and interest prior experience and training, as well as comfort and self-assurance, can also greatly affect teachers' proficiency in the use of digital technology for instruction [4]. The broader societal norms regarding gender roles and expectations can impact the opportunities and encouragement individuals, irrespective of gender, receive in developing digital skills. Recognizing the diversity of factors, including gender, suggests that professional development programs should be tailored to address individual needs and circumstances to enhance digital competence among teachers.

In Portugal, a study indicated that the evolution of Information and Communication Technologies (ICT) and their global implementation have brought about notable transformations across various domains, particularly within institutions [7]. This article presents findings from a research endeavor aimed at assessing the digital competence levels of university education students and investigating whether factors such as gender and age play a role in influencing these levels. Employing a quantitative methodology utilizing non-experimental, descriptive, and inferential approaches, the study utilized a digital questionnaire to collect data on participants' knowledge and proficiency in ICT, as well as their attitudes towards them. Data analysis involved comparing mean values using non-parametric tests. Results indicate that participants evaluated their understanding of ICT concepts negatively but perceived their ability to utilize devices, tools, and services positively, displaying a highly favorable attitude towards technology overall. Concerning the variables under scrutiny, significant disparities were noted, with men demonstrating higher levels of knowledge and proficiency, while older respondents exhibited a more positive attitude towards technology.

in a study aimed at establishing a basic framework that identifies various Information and Communication Technology (ICT) competencies, specifically technological and pedagogical, among Spanish teachers [1]. They also sought to comprehend how these competencies were influenced by personal and contextual factors. The study analyzed data from

two surveys regarding teachers' digital competencies, involving 1095 participants from the Valencian community. They used the Multiple Indicators and Multiple Causes Model (MIMIC) to authenticate the teachers' ICT competency model. The results suggested that digital competencies comprised distinct technological and pedagogical capabilities, with the former influencing the latter. Moreover, it was discovered that personal and contextual factors had a significant impact on these competency subsets. The researchers concluded that these factors are essential in designing and training for digital competencies. The results of the study suggested that digital competencies among teachers comprised distinct technological and pedagogical capabilities. This implies that teachers need both technical skills related to using digital tools and devices and pedagogical skills to integrate technology effectively into teaching and learning. The study found that technological competencies had an influence on pedagogical competencies. This highlights the interconnectedness of technical and instructional skills, emphasizing that proficiency in using technology contributes to effective pedagogical practices.

In the study by [12] set out to examine the factors potentially associated with teachers' self-perceived levels of information literacy self-efficacy. Conducted with 101 teachers during the 2018 academic year, the study employed various questionnaires to measure levels of information literacy self-efficacy, digital newcomer/native status, personality attributes based on the Big Five model, mastery of computer applications, personal characteristics, and involvement in a digital program. A quantitative approach was used for the study. The findings showed a connection between teachers' perceptions of their information literacy self-efficacy level and their openness to experience, neuroticism, their level of digital skills, and their participation in a digital program. Based on these results, the researchers suggested that the Ministry of Education should focus on the development of pre-service and current teachers' information literacy skills to enhance their self-efficacy in information literacy.

This study by [10] examined the digital literacy, technological, and pedagogical competencies of primary school teachers in Kazakhstan, focusing on their interrelationships. The research included 223 primary school teachers from various schools in Almaty, utilizing the 'Digital Literacy Scale,' 'Pedagogical Competence Scale,' and 'Technological Competence Scale' for data collection. T and F tests compared teachers' competencies based on gender and professional seniority, while the 'Multiple Regression Technique' analyzed the relationships among the variables. Findings indicated that primary school teachers possessed high pedagogical competencies, with digital literacy and technological competencies at a moderate level. Competencies varied significantly by gender and professional seniority: male teachers showed higher technological competence and digital literacy, while female teachers excelled in pedagogical competence. Multiple regression analysis revealed that teachers' digital literacy significantly predicted their pedagogical and technological competencies. With the integration of technology in education, mastering digital literacy and technological skills alongside pedagogy has become essential for teachers.

Emerging educational trends driven by technology necessitate the development of Teacher Digital Competence (TDC), regulated by frameworks like DigCompEdu. In the study that aimed to determine and compare teachers' self-perceived digital competence across different stages of compulsory education (Early Childhood, Primary, and Secondary Education) based on gender, age, years of teaching experience, and hours of ongoing education [11]. The study also examines how various predictors influence the acquisition of TDC. An ex post facto non-experimental design was employed, involving 78,966 teachers from Andalusia (Spain). The findings indicate that the level of TDC is generally low to medium, and the analyzed variables significantly impact and predict TDC levels. The study concludes by discussing the complexity of this phenomenon and highlights the need for personalized training programs for teachers.

There are studies that explore how the age, gender, and other factors of teachers can influence their digital competence during instruction. The studies indicate that age and gender can impact the prediction of teachers' pedagogical knowledge, but the specific educational level at which teachers instruct does not play a significant role. Digital competence, referring to a teacher's proficiency in using technology in the classroom, may be influenced by age, with younger teachers potentially being more familiar with digital tools. However, older teachers can also demonstrate high technological proficiency given motivation, willingness to learn, professional development, and the availability of digital resources. Gender can also slightly affect digital competence but it is not the sole determinant. Other factors such as societal norms, accessibility, personal motivation, prior experience and training, and comfort and self-assurance also play crucial roles. The broader societal norms regarding gender roles impact opportunities and encouragement for individuals, regardless of gender, to develop digital skills. Recognizing these diverse factors suggests that professional development programs should be tailored to address individual needs, enhancing digital competence among teachers. Most study's findings agree emphasizes those teachers need both technical and pedagogical skills to integrate technology effectively into teaching and learning.

2. Methodology

2.1. Research Design

The study adopted a combination of both descriptive survey and correlation research design. The descriptive survey approach systematically gathered and analyzed data to outline the characteristics, behaviors, and attitudes of ECDE teachers in relation to digital competence and language instruction.

This method provided a detailed overview of the teachers' digital skills, pedagogical factors, and instructional practices in Upper Eastern Kenya, identifying areas for improvement. Similarly, correlation research design was utilized to explore the relationship between ECDE teachers' digital competence and language instruction in a natural setting without manipulation. This approach offered insights into the connections between digital competence and language instructional.

2.2. Sampling

The study population constituted of Language Teachers, Head teachers and ECDE County Directors in the Upper Eastern Region of Kenya with the ECDE being the main respondents. The target population of the study was 4,021 respondents comprising of 2,009 ECDE teachers, 2,009 head teachers, and three county directors. The study used Yamane's simplified formula method to determine the sample size for teachers, head teachers, and ECDE directors participating in the research. This sample size offered a reliable basis for deriving the figures and ensured consistent, unbiased estimates from a variety of respondents. Out of the population, 364 individuals participated, including 181 head teachers, 181 teachers, and three county directors. as illustrated in the table 1.

Table 1. *Sampling Grid.*

County	Population	Sample			Total
		Head Teachers	ECDE teachers	ECDE Directors.	
Embu	1239	56	56	1	113
T/Nithi	1155	52	52	1	105
Meru	1626	73	73	1	147
Total		181	181	3	364

Researcher, 2024

Three counties in Kenya's upper Eastern region—Embu, Tharaka Nithi, and Meru—were purposefully selected for the study. Within each county, schools were chosen through simple random sampling, while ECDE language teachers and head teachers were chosen purposefully. In each selected school, one ECDE teacher was randomly chosen and paired with the corresponding head teacher, maintaining a 1:1 ratio of ECDE language teachers to head teachers. A constant value of 0.0905 was determined by dividing the target sample size of 364 by the total population of 4,021. This constant was then used to allocate samples proportionally across counties: Embu had 113 respondents, Tharaka Nithi 105, and Meru 147. Additionally, the county directors from each of these counties were included purposefully to contribute data for analysis.

2.3. Instruments

Data was collected using two structured questionnaires and an interview schedule. The questionnaires were filled out by the language teachers and their corresponding head teachers from the sampled schools. The questionnaires were considered relevant for collecting data from the respondents because they were the ideal instrument for data collection from respondents who were diverse and large in number. The questionnaires consisted of six sections in a Likert type to seek respondents' opinions related to the digital competence of ECDE teachers and their influence on language instruction. The interviews were conducted to the county directors to corroborate the results from the ECDE language teachers and the head teachers. Prior to collection of data piloting was conducted to ascertain validity and reliability of the instruments. Before collection of data pre-tests and data was evaluated for normality, collinearity, autocorrelation, and heteroscedasticity. The Shapiro-Wilk Test revealed a non-normal distribution, informing the choice of regression type, while the Variance Inflation Factor (VIF) values, ranging from 1.983 to 2.430, indicated no multicollinearity. The Durbin-Watson test results, with values between 2.325 and 2.481, confirmed the absence of autocorrelation, supporting reliable regression estimates. Lastly, the Koenker test, with p-values from 0.097 to 0.389, showed no heteroscedasticity across models, affirming the data's suitability for regression analysis.

3. Results

The objective sought to establish the extent to which the ECDE teachers' assessment of their level of digital competence.

Descriptive data was sought based on the contributions of ECDE teachers' personal characteristics in the relationship between their digital competence and language instruction.

Teachers' personal characteristics considered include age gender, level of education, and teaching experience. This section presents an analysis of the contribution of each sequentially. The contributions of ECDE teachers age in the relationship between their digital competence and language instruction was assessed based on five statements. Table 1 presents a summary of the findings.

Table 2. *Teachers Age and Digital Competence (ECDE Teachers).*

Age; I believe that;	NE	LE	ME	GE	VGE	Total
Younger teachers are more proficient in use of digital tools compared to their older counterparts	2.7	5.4	21.8	33.3	36.7	100.0
Young teachers are more open to adopting new technologies	5.4	6.1	26.5	29.9	32.0	100.0
Young teachers are more comfortable in using digital tools	4.1	6.1	27.2	26.6	34.0	100.0
Young teachers find it easy to use digital tools	5.4	5.4	25.2	26.6	35.4	100.0
Young teachers are able to utilize digital tools effectively	10.2	5.4	22.4	27.2	34.7	100.0

ECDE Teacher (N=171)

Data obtained showed that more than two-thirds of the sampled teachers (70.0%), agreed to the fact that younger teachers were more proficient in use of digital tools, are more open to adopting new technologies (61.9%) are more comfortable in using digital tools (60.6%), find it easy to use digital tools (62.0%) and are also able to utilize digital tools effectively compared to their older counterparts 61.9%. Findings was supported by two thirds of the head teachers (66.4%) who said that young teachers were more open to adopting new technologies and were also more comfortable in utilizing digital resources. Moreover, younger ECDE teachers were more receptive to integrating technology into their teaching practices, potentially leading to more innovative and engaging learning experiences for learners. According to the study [2] the researcher emphasized that teachers who are younger might be more at ease and familiar with the use of digital tools, having been exposed to technology for most of their lives. However, this does not exclude older teachers, who also demonstrate a high level of technological proficiency and keenly adopt technology if they possess the motivation to learn and adjust. The contributions of ECDE teachers' gender in the relationship between their digital competence and language instruction was also assessed based on five statements. Table 3 presents a summary of the findings.

Table 3. *Gender and Digital Competence (ECDE Teachers).*

Gender;	NE	LE	ME	GE	VGE	Total
Male teachers are able to use digital resource efficiently in language instruction compared to the female teachers	15.0	13.6	30.6	25.2	15.6	100.0
Male teachers are more willing to adopt digital technologies compared to female teachers	16.3	10.2	27.9	26.5	19.0	100.0
Male teacher frequently utilizes digital tools in language instruction as compared to their female counterparts	9.5	8.2	36.1	22.4	23.8	100.0
Male language teachers are more motivated in attending training on digital knowledge compared to the female teachers	4.8	7.5	26.6	29.9	29.3	100.0
Male teachers are more Initiative in utilizing of digital resources creatively compared to their female counterparts.	6.1	6.8	22.4	35.4	29.3	100.0

ECDE Teacher (N=171)

The contributions of ECDE teachers' gender in the relationship between their digital competence and language instruction was assessed. The data showed that less than half of the teachers sampled (40.8%) responded that the male teach-

ers were able to use digital resource efficiently, were willing to adopt to digital technologies (45.5%), were frequently utilizing digital tools (46.2%), were motivated in attending trainings to get digital knowledge (59.2%) and, were more initiative in utilizing digital resources creatively compared to their female counterparts. Teachers' findings were corroborated by more than half of the head teachers (52.9%) who noted that there was no much difference in the mannerism of handling digital resources from both the gender. However, notably, men were seen to be enthusiastic in the learning/training on how to utilize digital resources in the leaning process. Study by [8] narrated that gender is not exclusive determinant of digital proficiency since digital competence solely relies on the proficiency to utilize digital resources in instructional process. While gender may exert some influence on their digital competence, it is not the only driving factor.

The contributions of ECDE teachers' level of education in the relationship between their digital competence and language instruction was assessed based on five statements. Table 4 presents a summary of the findings.

Table 4. *Level of Education and Digital Competence (ECDE Teachers).*

Level of education;	NE	LE	ME	GE	VGE	Total
Improves utilization of digital tools in the classroom	3.4	6.1	40.1	22.4	27.9	100.0
Influences the choice of teaching methods to use	2.7	11.6	15.6	41.5	28.6	100.0
Enhances creativity in using digital resource in teaching	0.7	10.9	20.4	33.3	34.7	100.0
Contributes to adoption of new pedagogical methods such as technologies	2.0	9.5	29.3	31.3	27.9	100.0
Boosts integration of digital tools in language instruction	2.7	7.5	21.1	42.2	26.5	100.0

ECDE Teacher (N=171)

Teacher's level of digital competence was assessed based on ECDE teachers' level of Education in language instruction. The data obtained indicated that half of the ECDE teachers' level of education (50.3%) improved utilization of digital tools, influenced the choice of teaching methods to use (70.1%), enhanced creativity in using digital resource (68.0%), contributed to adoption of new pedagogical methods such as technologies (59.2%) and boosted integration of digital tools in language instruction (68.7%). This finding was corroborated by two-thirds of the head teachers (66.4%) who concurred that level of education had a clear correlation between teachers' level of education and their ability to effectively utilize digital resources in the classroom. In the study that aimed to determine and compare teachers' self-perceived digital competence across different stages of compulsory education (Early Childhood, Primary, and Secondary Education) based on gender, age, years of teaching experience, and hours of ongoing education [11]. The findings indicate that the level of TDC is generally low to medium, and the analyzed variables significantly influences and predict TDC levels. The study concludes by discussing the complexity of this phenomenon and highlights the need for personalized training programs for teachers. The study also sought to assess how teachers experience contributes towards their digital competence. A set of five statements were used for this purpose. Their responses were as illustrated in the Table 5.

Table 5. *Teachers Experience and Digital Competence (ECDE Teachers).*

Teaching experience;	NE	LE	ME	GE	VGE	Total
Contribute to a teacher's ability to use new technologies	0.7	6.1	16.3	37.4	39.5	100.0
Enhances planning to use digital tool in instruction	12.9	8.2	27.9	24.5	26.5	100.0
Share knowledge with others on digital tools utilization	7.5	9.5	25.2	22.4	35.4	100.0
Have an understanding on how to integrate digital resource in teaching	20.4	6.8	17.0	30.6	25.2	100.0
Able to solve varied problems using digital tools and techniques	2.7	7.5	27.2	28.6	34.0	100.0

ECDE Teacher (N=171)

Teacher's level of digital competence was assessed based on ECDE teachers' experience in language instruction. The data obtained indicated that more than three-quarters of the ECDE teachers (76.9%), recognized the significance of teaching experience in contributing to a teacher's ability to use new technologies, enhances planning to use digital tool in instruction (51.0%). share knowledge with others on digital tools utilization (57.8%), have an understanding on how to integrate digital resource in teaching (55.8%) and provide teachers with the capacity to be able to solve varied problems using digital tools (62.6%). The findings were supported by more than half of the head teachers (53.0%) who considered teaching experience crucial in promoting knowledge and integration of digital tools into the learning process. A study done in Germany focused on assessing educators' digital competence using a self-assessment tool [6]. The study involved 335 participants and revealed a significant difference between teachers with negative attitudes towards technology's benefits and those with neutral or positive attitudes. Teachers experienced in using technology in the classroom scored higher.

The qualitative findings reveal that teachers' age significantly influences their digital competence in language instruction. Younger teachers are more passionate and skilled in using digital tools compared to their older counterparts, who often see digital resources as extra work. Age is a key factor in determining ease of adoption and proficiency with digital resources, with younger teachers being more adaptable. In terms of gender, male teachers are generally more enthusiastic about using digital tools, though no significant difference in competence between genders was observed. Education level also plays a critical role, with teachers holding higher qualifications being more adept at manipulating digital tools. Teaching experience enhances the ability to use digital resources efficiently, as experienced teachers are more aware and skilled in utilizing new tools. Overall, age, gender, education level, and experience all influence digital competence, but passion and adaptability are especially prominent in younger teachers and those with higher education levels.

The study assessed the inferential relationship between digital competence, teachers' personal characteristics and language instruction. The hypothesis, $H_0 2$ sought to establish whether ECDE teachers' personal characteristics have any statistically significant influence in the relationship between digital competence and language instructions in ECDE centers in upper eastern region in Kenya. Logistic regression used for this purpose yielded findings as summarized in Tables 6 and 7.

Table 6. *Influence of Teachers' Personal Characteristics in the Relationship between Digital Competence and Language Instruction (Model Summary).*

Step	-2 Log likelihood	Cox & Snell R^2	Nagelkerke R^2	χ^2	df	Sig.
1	152.311	0.211	0.293	3.084	5	0.687

Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Independent variable in the model was digital competence. The model was significant $\chi^2[6]=34.824$, $p<0.001$ and the Hosmer and Lemeshow Test confirmed model fit, χ^2 [6]=3.084, p=0.687. Cox & Snell R square predicted a variance of 21.1% while Nagelkerke R square predicted 29.3% variation in language instruction explained by the model. The model with independent variable explained 70.1% of digital competence, an improvement from the initial 66.7% initially predicted. Table 7 presents information on variables in the equation.

Table 7. *Influence of Teachers' Personal Characteristics in the Relationship between Digital Competence and Language Instruction (Regression Coefficient).*

	B	SE	Waldχ^2	df	Sig.	Exp(B)
Digital Competence	2.142	0.593	13.049	1	0.000	8.513
Age	0.683	0.649	1.106	1	0.293	1.980
Gender	-2.184	1.033	4.472	1	0.034	0.113
Level of Education	0.774	0.805	.925	1	0.336	2.169
Teaching Experience	-0.947	0.544	3.029	1	0.043	0.388
Constant	-1.844	0.887	4.324	1	0.038	0.158

Variable(s) entered on step 1: Digital Competence, Age, Gender, Level of Education and Teaching Experience.

Information obtained show that ECDE teachers' digital competence positively and significantly predicted language instruction, Wald $\chi^2[1] = 13.049$, $p < 0.001$, Exp(B)=8.513). Age positively predicted the relationship between digital competence and language instruction by a factor of 1.98, Wald $\chi^2[1] = 1.106$, $p = 0.293$, Exp(B) = 1.980), the observation being insignificant. Gender negatively predicted the odds of the relationship between digital competence and language instruction, Wald $\chi^2[1] = 4.472$, $p = 0.034$, Exp(B) = 0.113), ECDE centers of male ECDE teachers being less likely to exhibit better traits of language instruction than those of their female counterparts by a factor of 0.1, the observation being significant. Level of education was positively associated with the relationship between digital competence and language instruction; Wald $\chi^2[1] = 0.925$, $p = 0.336$, Exp(B) = 2.169), the possibility of a more educated ECDE teacher increasing the odds of the relationship between digital competence and language instruction, the observation being insignificant. Teaching experience was found to negatively and significantly predict the relationship between digital competence and language instruction; Wald $\chi^2[1] = 3.029$, $p = 0.043$, Exp(B) = 0.388). Thus, the study established that gender and experience are significant predictors of the relationship between digital competence and language instructions in ECDE centers in upper eastern region. Therefore, the second hypothesis, $H_0 2$ which stated that personal characteristics have no statistically significant influence in the relationship between digital competence and language instruction in ECDE centers in upper eastern region was rejected.

4. Discussions

The objective sought to establish the relationship between digital competence and language instruction among ECDE teachers in Upper Eastern, Kenya based on their personal characteristics. A teacher's level of digital competence was assessed based on their age, gender, level of education and teachers experience in use of digital tools or resources for use in language instruction. Data obtained showed that more than two-thirds of the sampled teachers (70.0%), agreed to the fact that younger teachers were more proficient in use of digital tools, are more open to adopting new technologies (61.9%) are more comfortable in using digital tools (60.6%), find it easy to use digital tools (62.0%) and are also able to utilize digital tools effectively compared to their older counterparts 61.9%. Findings was supported by two thirds of the head teachers (66.4%) who said that young teachers were more open to adopting new technologies and were also more comfortable in utilizing digital resources. Moreover, younger ECDE teachers were more receptive to integrating technology into their teaching practices, potentially leading to more innovative and engaging learning experiences for learners. In the study by [2], the authors emphasized that teachers who are younger might be more at ease and familiar with the use of digital tools, having been exposed to technology for most of their lives. However, this does not exclude older teachers, who also demonstrate a high level of technological proficiency and keenly adopt technology if they possess the motivation to learn and adjust.

The contributions of ECDE teachers' gender in the relationship between their digital competence and language instruction was assessed. The data showed that less than half of the teachers sampled (40.8%) responded that the male teachers were able to use digital resource efficiently, were willing to adopt to digital technologies (45.5%), were frequently utilizing digital tools (46.2%), were motivated in attending trainings to get digital knowledge (59.2%) and, were more initiative in utilizing digital resources creatively compared to their female counterparts. Teachers' findings were corroborated by more than half of the head teachers (52.9%) who noted that there was no much difference in the mannerism of handling digital resources from both the gender. However, notably, men were seen to be enthusiastic in the learning/training on how to utilize digital resources in the leaning process. Study by [15] narrated that gender is not exclusive determinant of digital proficiency since digital competence solely relies on the proficiency to utilize digital resources in instructional process. While gender may exert some influence on their digital competence, it is not the only driving factor.

Teacher's level of digital competence was assessed based on ECDE teachers' level of Education in language instruction. The data obtained indicated that half of the ECDE teachers' level of education (50.3%) improved utilization of digital tools, influenced the choice of teaching methods to use (70.1%), enhanced creativity in using digital resource (68.0%), contributed to adoption of new pedagogical methods such as technologies (59.2%) and boosted integration of digital tools in language instruction (68.7%). This finding was corroborated by two-thirds of the head teachers (66.4%) who concurred that level of education had a clear correlation between teachers' level of education and their ability to effectively utilize digital resources in the classroom. In the study that aimed to determine and compare teachers' self-perceived digital competence across different stages of compulsory education (Early Childhood, Primary, and Secondary Education) based on gender, age, years of teaching experience, and hours of ongoing education [11]. The findings indicate that the level of TDC is generally low to medium, and the analyzed variables significantly influences and predict TDC levels. The study concludes by discussing the complexity of this phenomenon and highlights the need for personalized training programs for teachers.

Teacher's level of digital competence was assessed based on ECDE teachers' experience in language instruction. The data obtained indicated that more than three-quarters of the ECDE teachers (76.9%), recognized the significance of teaching experience in contributing to a teacher's ability to use new technologies, enhances planning to use digital tool in

instruction (51.0%). share knowledge with others on digital tools utilization (57.8%), have an understanding on how to integrate digital resource in teaching (55.8%) and provide teachers with the capacity to be able to solve varied problems using digital tools (62.6%). The findings were supported by more than half of the head teachers (53.0%) who considered teaching experience crucial in promoting knowledge and integration of digital tools into the learning process. The study by [6] in Germany focused on assessing educators' digital competence using a self-assessment tool. The study involved 335 participants and revealed a significant difference between teachers with negative attitudes towards technology's benefits and those with neutral or positive attitudes. Teachers experienced in using technology in the classroom scored higher.

Inferential analysis based on logistic regression illustrated that ECDE teachers' digital competence positively and significantly predicted language instruction, Waldχ^2[1] = 13.049, $p < 0.001$, Exp(B)=8.513). Age positively predicted the relationship between digital competence and language instruction by a factor of 1.98, Waldχ^2[1] =1.106, p = 0.293, Exp(B) = 1.980), the observation being insignificant. Gender negatively predicted the odds of the relationship between digital competence and language instruction, Waldχ^2[1] = 4.472, p = 0.034, Exp(B) = 0.113), ECDE centers of male ECDE teachers being less likely to exhibit better traits of language instruction than those of their female counterparts by a factor of 0.1, the observation being significant. Level of education was positively associated with the relationship between digital competence and language instruction; Waldχ^2[1] = 0.925, p = 0.336, Exp(B) = 2.169), the possibility of a more educated ECDE teacher increasing the odds of the relationship between digital competence and language instruction, the observation being insignificant. Teaching experience was found to negatively and significantly predict the relationship between digital competence and language instruction; Wald χ^2[1] = 3.029, p = 0.043, Exp(B) = 0.388). Findings imply that ECDE teachers' personal characteristics positively and significantly relate with digital competence in instruction of language. The study by [14] found out that teacher's personal characteristics such as age and gender can influence the prediction of teachers' pedagogical knowledge. To recommend, while age of ECDE teachers was not a significant predictor, capacity building should focus more on older teachers who might benefit from age-specific training that addresses potential gaps in digital skills. Gender, level of education and teachers experience should also be taken into account.

5. Conclusions

Data obtained related to the objective illustrated a positive and significant influence of ECDE teachers' personal characteristics in the relationship between digital competence and language instruction. It can therefore be concluded that ECDE teachers' personal characteristics play an important role in the relationship between teachers' digital competence and language instruction. Therefore, the recommendation is that while age of ECDE teachers was not a significant predictor, capacity building should focus more on older teachers who might benefit from age-specific training that addresses potential gaps in digital skills. Gender, level of education and teachers experience should also be taken into account.

Abbreviations

ECDE	Early Childhood Development and Education
SPSS	Statistical Packages for Social Sciences
ICT	Information and Communication Technologies
MIMIC	Multiple Indicators and Multiple Causes Model
TDC	Teacher Digital Competence
VIF	Variance Inflation Factor
TDC	Teachers Digital Competence

Conflicts of Interest

The authors declare no conflicts of interest.

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