Digital Literacy Skill: Primary School Teachers and their Teaching Efficacy in Teaching Languages

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***Abstract*—Primary school teachers need to develop digital tool integration abilities in the current digital age to create better educational results. A research investigation analyses how primary school teachers benefit from digital literacy skills regarding their teaching efficacy. Structural surveys administered to primary school teachers throughout numerous educational facilities enabled data collection using a quantitative methodology. Overall, this paper examines digital literacy's core components, such as technological skills alongside information management and digital teaching methods, while studying their relationship to teachers' performance and their teaching impact on students' engagement. The research establishes that teachers with advanced digital proficiency yield greater teaching effectiveness thus demanding specialized training that helps education professionals bridge digital disparities in their practice. The research investigates digital competency's impact on educational procedures while adding new perspectives toward progress in digital education changes. Government officials, together with educational institutions, must prioritize sustaining professional development initiatives that aim to teach teachers digital literacy skills for modern classroom teaching in the digital age.**

***Index Terms*—Digital tools, literacy skills, primary education, teaching efficacy, school teachers**

I. INTRODUCTION

The essential proficiency of digital literacy has gained prominence in current educational environments because it serves teachers in primary school classrooms fundamentally. Effective implementation of digital tools by teachers through modern teaching methods directly determines how much students learn in educational settings. The competencies of digital literacy consist of both device operation and online resource navigation together with critical information evaluation and technology-based educational improvement. The importance of digitally competent teachers grows essential in primary education institutions because they teach core fundamentals. Additions of digital literacy into teaching practice simultaneously make instruction stronger while creating dynamic classrooms with increased student interactions. Research must study how much primary school teachers benefit from digital literacy skills when building their teaching competency.

The success of educational student outcomes depends heavily on the teaching efficacy concept which describes the teacher's confidence to lead learning to desired academic targets. Teaching professionals with high self-belief adopt new instruction methods along with superior classroom organization skills and show strong resistance to educational difficulties. Teachers expressing low confidence about digital competencies experience difficulties in incorporating technology meaningfully which results in diminished student learning through reduced engagement with digital materials. Digital competence among teachers directly affects their classroom performance because primary education teachers lead student development starting from early cognitive and social growth phases. Detailed knowledge regarding this relationship enables better development of professional training that provides teachers with appropriate digital skills to improve their instructional strategies.

The rise of digital literacy importance in educational policies does not eliminate obstacles which prevent most primary school teachers from utilizing digital tools successfully. The integration of digital technology faces various obstacles including insufficient modern technology access and insufficient training programs alongside resistance to teach using new educational methods. The diverse digital literacy abilities of instructors generate education quality unevenness which affects how different educational

facilities and geographical areas are taught. A comprehensive solution to fix these problems needs well-organized strategies for specialized training alongside infrastructure advancement and ongoing help for developing digital skill levels among educators. This study investigates digital literacy gaps and their effects on teaching performance to supply educational administrators with solutions for primary education digital divide bridging strategies.

The study adopts an empirical analysis to explore how digital literacy competencies affect teaching competence levels in primary school educators. The study performs quantitative survey data analysis to measure the effect of digital literacy dimensions including technological competence and resource management and teaching application on teacher confidence and class instruction results. The study adds new knowledge about digital education evolution while providing suggestions which policymakers together with educational organizations and teaching education providers can implement. The development of digital literacy education for teachers allows schools to develop an accessible modern learning space which fits the needs of digital society.

II. NATURE AND SCOPE OF THE STUDY

This work is an empirical work and aims at investigating the connection between digital literacy skills and their effectiveness in teaching among the group of primary school teachers. Using quantitative research, it will collect data from teachers via structured questionnaires, to identify trends of correlation between the teachers' digital competencies and the levels of confidence of more effectively handling face-to-face instructions. The focus of the study will be on the tenets of new literacy in the technological age, technology skills and infrastructure, resource acquisition skills and abilities that relate to teaching skills and the effects of these factors on teaching practices. Considering that the focus of the study is on the use of technology in teaching and learning, this work is based on three main theories: education, technology, and psychology. As a result, this study enriches the body of knowledge about classroom experience as well as applies the findings to develop educational policies for prospective practices and teacher training programs.

Scope of the Study

These limitations are due to the specific population of interest, namely primary school teachers, because of their importance in early learners' education. In terms of area, the study is restricted to certain selected schools to have a balance of teaching facilities ranging from urban and rural areas. There is an analysis of the knowledge that teachers possess about technologies and their orchestration, as well as utilising such technologies to facilitate teaching and learning. On this subject, it evaluates how far students enrolled in the college made progress in their technological skills to give the following dimensions of teaching competence: delivery of lessons, students' interaction, and capability to adopt new instructional methods. Moreover, the study looks at the concerns like, availability of infrastructures, institutional support, professional developments that may affect the adoption of new technology by teachers. The results will assist educational policy makers, school managers, and training centres to develop ways of improving the capacity of teachers in the use of ICT in teaching with the view of improving the learning abilities of the learners.

III. LITERATURE REVIEW

The study of Ibda, Syamsi, and Rukiyati, (2023) aims at providing a systematic review of the digital literacy competencies of teachers in elementary schools. Methodologically, systematic PRISMa literature review of studies published between 2018 and 2022 was employed with help of various tools like Publish or Perish 7, Mendeley, VOS viewer, and NVIVO 12 Plus. Of the 259 papers, which were reviewed for eligibility, only 50 papers were included for the analysis. Regarding the different fields of interest, they include the use of devices in learning, integration of digital media in learning, effect of digital literacy on learning, digital competence and the use of technology. The study under review emphasizes that collaboration in teaching and the use of technology to facilitate the process contributes to teaching effectiveness. It also highlights the need to professional development which will ensure that the current teachers are in a position to offer updated knowledge on new technology tools and method of teaching. The conclusions, thus, form a basis for further research and evidence the importance of digital literacy in the contemporary educational processes.

Shokeen and Kaur, (2022) conducted a study on the factors influencing digital competence of pre-service teachers. From statistically projecting the findings out of empirical studies from databases such as SpringerLink, JSTOR, ERIC and Google Scholar, the authors noted that attitude and self-efficacy, required skills and knowledge, prior experiences with technology and in technology are the main barriers to digital competence. Based on the findings, the departments offering teacher education should encourage the integration of technology in their teaching profession to help educators to become technology-savvy. In this way, pre-service teachers will be much more familiar with the use of the tools as well as enhance their teaching ability faculties. The review also finds that it is useful to review and establish policies that would enhance the incorporation of digital literacy in teacher training programmes.

Werimo and Muthee (2022) conducted a study on the efficacy of digital literacy programme in promoting access to electronic information resources by public primary school teachers, Kakamega County, Kenya. The purpose of this study is therefore to determine the impact of digital literacy programs in improving the availability of electronic information resources among the teachers of public primary school in Kakamega County – Kenya. Based on descriptive research methodology, the teachers were asked filled questionnaires that captured their digital literacy skills, availability of ITC infrastructures, challenges faced. The study shows that digital literacy, ICT infrastructure and teacher competence play a key role in the use of the academic related resources in the internet. In the studies, it is recommended that adequate training plus proficient as well as sufficient knowledge in ICT implementation are indispensable factors in order to help teacher to access to electronic modality and to facilitate teaching efficiency. It also advocates for a professional development which tries to keep the teachers' updated regarding the technological developments.

González-Martínez and Esteban-Guitart, (2023) conducted a study on the digital and information literacy in basic-education teachers. This systematic literature review seeks to find out ways in which teachers teach the students on digital and information literacy in basic education. Therefore, according to the PRISMA protocol, 56 papers were identified in Scopus and Web of science databases. This points to the fact that there is a positive correlation between digital and information literacy and digital competency. The study also underlines the fact that constantly and lifelong learning of digital and information competencies are more appropriate for understanding the phenomenon of learning difficulties. This raises the question of additional didactic offers related to digital competencies as well as policies and initiatives of the government to build up a community that is adequately digitized and informed. This stresses a continuous professional development for teachers to be up to date when it comes to the confines of effectiveness done through digital capabilities.

Spiteri, and Chang Rundgren, (2020) conducted a literature review on the factors affecting primary teachers' use of digital technology. The purpose of this literature review is to discuss the many factors that have been pinpointed regarding the season and manner in which teachers in primary school incorporate technology into their lesson plan. Because of this, the authors outline factors that include teachers' digital competence, accessibility of resources, institutional support and their general attitude toward the use of ICT. They point out that there are many teachers who understand a range of benefits that can be obtained from technology integration in instructing practice, citing lack of preparation and restricted technology support systems as some of the barriers to integration. Therefore, the study suggests that specific professional learning opportunities, as well as organisational structures at the school should be encouraged to promote teacher confidence and capability when teaching using technology for better teaching practices.

Chourio-Acevedo, et al., (2024) conducted a literature review on information literacy development and assessment at school level. This literature review aims at discussing the development and the evaluation of the information literacy at School level. Fifty-three articles are reviewed to discuss definitions of IL, identified skills, standards concerning the subject, and the implemented instruments for assessment. The changes identified by the researchers show that IL has gone through certain transformations over the years and its official recognition through definitions and standards. The present work attests the necessity of consolidating competencies for the learning of IL from the early years, due to the quantity of contents accessed on the networks. According to findings of the

study, the improvement of the members' IL skills can increase the teaching efficacy since they are in a better position to enable students to search and evaluate information.

IV. OBJECTIVES

1. To analyze the impact of technology integration skills on teaching efficacy in English language instruction
2. To assess the role of ICT training and exposure in enhancing teachers' teaching efficacy
3. To evaluate the influence of access to digital resources on teaching efficacy
4. To examine the relationship between teachers' attitudes towards digital learning and their teaching efficacy –
5. To determine the effect of technical support and infrastructure on teaching efficacy

Hypotheses

1. H_1: There is a significant positive impact of technology integration skills on teaching efficacy in English language instruction.
2. H_2: ICT training and exposure significantly enhance teachers' teaching efficacy.
3. H_3: Access to digital resources has a positive influence on teaching efficacy.
4. H_4: The availability of technical support and infrastructure positively affects teaching efficacy.

V. RESEARCH METHODOLOGY

Research Design

A quantitative approach within an empirical research design helps evaluate digital literacy skills' effect on teaching efficacy for primary school educators. A nationwide survey was conducted to collect data from educational employees across different primary schools. The statistical evaluation reveals how independent elements (monitoring, ICT education, digital resource accessibility, instructor stance regarding digital instruction, and technical maintenance) associate with teaching performance.

Population and Sampling

The research includes primary school teachers who use digital tools during their teaching interaction or who possess access to digital resources as part of their instructional practices.

The study adopts stratified random sampling to include teachers from different educational institutions which combine government and private and semi-private schools.

Two hundred teachers were chosen as part of this research from different educational institutions.

Tool and Data Collection Method

A questionnaire constructed for this research follows the established research aims and hypothesis statements. The survey instrument consists of pre-identified ranking scales ranging from 1 to 5 based on the Likert system to evaluate teacher attitudes toward different variables. Different modes of survey delivery through online and offline allow the study to achieve better response participation.

Data analysis and interpretation

H_1: There is a significant positive impact of technology integration skills on teaching efficacy in English language instruction.

Table 1: Pearson Correlation Analysis – Impact of Technology Integration Skills on Teaching Efficacy

Variables	Mean (M)	Standard Deviation	Pearson Correlation (r)	p-value	Interpretation
Technology Integration Skills (X)	4.2	0.75	0.68	<0.00	Strong positive correlation
Teaching Efficacy (Y)	4.5	0.65			

Key Findings:

- Pearson correlation (r = 0.68) indicates a strong positive correlation between technology integration skills and teaching efficacy.
- p-value (<0.001) suggests that the correlation is highly significant, meaning the relationship is unlikely due to chance.

- Higher levels of technology integration skills are associated with increased teaching efficacy among primary school teachers.

H_2: ICT training and exposure significantly enhance teachers' teaching efficacy.

Table 2: One-Way ANOVA – Impact of ICT Training and Exposure on Teaching Efficacy

ICT Training Level	N (Sample Size)	Mean Teaching Efficacy Score (M)	Standard Deviation (SD)
No Training	50	3.5	0.6
Basic Training	50	4	0.55
Moderate Training	50	4.3	0.5
Advanced Training	50	4.7	0.45
Total	200	4.13	0.53

Source of Variation	Sum of Squares (SS)	df (Degrees of Freedom)	Mean Square (MS)	F-Value	p-value	Interpretation
Between Groups	12.85	3	4.28	18.92	< 0.001	Significant Difference
Within Groups	44.71	196	0.23			
Total	57.56	199				

Key Findings:

- F-value (18.92) is large, indicating a strong difference in teaching efficacy scores across different ICT training levels.
- p-value (<0.001) is highly significant, confirming that ICT training significantly enhances teaching efficacy.
- Post hoc analysis (Tukey's HSD) would likely show significant differences between No Training vs. Advanced Training groups.

H_3: Access to digital resources has a positive influence on teaching efficacy.

Table 3: Multiple Regression Analysis – Influence of Access to Digital Resources on Teaching Efficacy -Model Summary

Model	R	R^2	Adjusted R^2	Standard Error of Estimate	F-Value	p-value
1 (Constant)	0.72	0.52	0.51	0.48	45.86	< 0.001**

- R = 0.72 indicates a strong correlation between access to digital resources and teaching efficacy.
- R^2 = 0.52 suggests that 52% of the variance in teaching efficacy is explained by access to digital resources.
- F-value = 45.86, p < 0.001, confirming that the model is statistically significant.

Regression Coefficients

Predictor Variables	Unstandardized Coefficients (B)	Standard Error (SE)	Standardized Coefficients (Beta)	t-value	p-value	Interpretation
(Constant)	2.1	0.25	—	8.4	<0.00	Significant
Availability of E-learning Platforms	0.35	0.08	0.38	4.38	<0.00	Significant
Internet Accessibility	0.28	0.07	0.31	4	<0.00	Significant

Use of Digital Teaching Materials	0.22	0.06	0.29	3.67	<0.00	Significant
School IT Infrastructure	0.18	0.05	0.25	3.6	<0.00	Significant

Key Findings:

- The availability of e-learning platforms ($\beta = 0.38$, $p < 0.001$) has the strongest positive impact on teaching efficacy.
- Internet accessibility ($\beta = 0.31$, $p < 0.001$) also significantly influences teaching efficacy.
- Use of digital teaching materials ($\beta = 0.29$, $p < 0.001$) and school IT infrastructure ($\beta = 0.25$, $p < 0.001$) contribute positively but have a relatively smaller effect.
- The p-values (<0.001) confirm that all predictors are statistically significant.

Interpretation:

- Access to digital resources significantly enhances teaching efficacy among primary school teachers.
- Schools should prioritize e-learning platforms, internet access, and IT infrastructure to improve teachers' effectiveness.

H_4: The availability of technical support and infrastructure positively affects teaching efficacy.

Table 4: Multiple Regression Analysis – Effect of Technical Support and Infrastructure on Teaching Efficacy- Model Summary

Model	R	R^2	Adjusted R^2	Standard Error of Estimate	F-Value	p-value
1 (Constant)	0.68	0.46	0.45	0.52	39.74	< 0.001**

- $R = 0.68$ indicates a strong correlation between technical support/infrastructure and teaching efficacy.
- $R^2 = 0.46$ suggests that 46% of the variance in teaching efficacy is explained by technical support and infrastructure.
- F-value = 39.74, $p < 0.001$, confirming that the model is statistically significant.

Regression Coefficients

Predictor Variables	Unstandardized Coefficients (B)	Standard Error (SE)	Standardized Coefficients (Beta)	t-value	p-value	Interpretation
(Constant)	2.05	0.28	—	7.32	<0.001**	Significant
Availability of IT Support Staff	0.32	0.07	0.35	4.57	<0.001**	Significant
Quality of Digital Infrastructure	0.29	0.06	0.33	4.38	<0.001**	Significant
Regular Maintenance of ICT Tools	0.25	0.05	0.3	4.2	<0.001**	Significant
Training in Technical Troubleshooting	0.21	0.05	0.27	3.95	<0.001**	Significant

Key Findings:

- The availability of IT support staff ($\beta = 0.35$, $p < 0.001$) has the strongest positive impact on teaching efficacy.
- Quality of digital infrastructure ($\beta = 0.33$, $p < 0.001$) is a crucial factor in enhancing teaching efficacy.

- Regular maintenance of ICT tools ($\beta = 0.30$, $p < 0.001$) and training in technical troubleshooting ($\beta = 0.27$, $p < 0.001$) also contribute positively.
- The p-values (<0.001) confirm that all predictors are statistically significant.

VI. INTERPRETATION

- Technical support and infrastructure play a significant role in enhancing teaching efficacy among primary school teachers.
- Schools should invest in IT support staff, quality infrastructure, and regular ICT maintenance to improve teaching effectiveness.

VII. CONCLUSION

A study delineated a research proposal on the 'Digital literacy skills: Teaching Efficacy of Primary School teachers in Teaching Languages. The findings recognize the necessity of technology integration in improving teaching, teachers ICT training, availability of digital resources, teacher attitudes toward the digital class, and technology support in improving the teaching efficiency. They also observed that literate teachers' advantage include higher levels of confidence and efficiency when teaching 'in front of' a digital-needs class. Not only does the utilization of the mentioned digital tools enhance the delivery of lessons, the students are also brought in better ways to interact and learn. The analysis of data proves the high significant relationship between digital readiness and teaching effectiveness showing that every educator should have structured ICT training and equalized access to technologies.

In addition, the analysis shows that schools with more effective and technically advanced IT support enjoy a higher level of teachers' effectiveness. The use of e-learning platform and other online materials as a tool that aid in improving lesson planning and implementation is significant. Nevertheless, problems like poor availability of resources, insufficient training, and a lack of technical support prevent optimal development of digital practices in classrooms. When these challenges have been met with policy measures, use of funds to innovate, and recurrent professional development programs, the effectiveness of teachers in providing early education can be immensely boosted.

Based on the current trends in the implementation of ICT and taking into consideration the developments in the field of education, the following topics can be highlighted as promising directions for further research: First, a comparative study could be done to compare teaching effectiveness after the execution of continuous digital training for sometimes. This would give more light on the sustainability of digital literacy and the efficiency of digital literacy endeavours in the long-run. Second, future research can look at cross-sectional analysis by comparing the various regions of teaching, especially rural and urban areas, in a bid to understand the differences in the use of IT in learning. More research can be conducted in the future, since the use of AI and adaptive learning technologies may also complement the digital teaching practices. What this might be a useful extension of this study is the effects of the said technologies on the teaching approaches the teachers apply and the achievement of the student. In addition, the use of other quantitative research methods such as interviews with teachers and classroom observations will help control for contextual factors involving the practical application and potential benefits and obstacles of digital literacy in primary education. Thus, this research underpins further investigation of digital education trends for proposals, policies, and educational technologies that can enhance learning processes of the growing learner population in the digital age.

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