

# Assessment of Digital Literacy Skills and the Use of Digital Resources for Teaching among Primary School Teachers in Jigawa State

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| Article History                                                                                                                                                                                                                                                                                                               | Abstract                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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| Original Research Article                                                                                                                                                                                                                                                                                                     | <p><i>This study examined the digital literacy skills and utilisation of digital resources among primary school teachers in Jigawa State, Nigeria. Specifically, it assessed teachers' digital literacy skills, identified the digital resources available for teaching, determined the extent of their utilisation, and identified the challenges hindering effective use. The study adopted a quantitative approach and cross-sectional survey design. The population comprised 2,912 primary school teachers, from which a sample of 334 respondents was determined using the Taro Yamane formula. A multistage sampling technique was employed to select respondents from primary schools across the 27 Local Government Areas of Jigawa State. Data were collected using a structured questionnaire and analysed using SPSS Version 27.0. Frequencies, percentages, means, and standard deviations were used to answer the research questions, while Pearson Product-Moment Correlation and One-Way Analysis of Variance (ANOVA) tested the hypotheses at the 0.05 significance level. The findings revealed that teachers demonstrated generally low digital literacy skills, particularly in digital content creation, technological problem-solving, and independent acquisition of new digital skills. However, digital resources were generally available, with smartphones, search engines, computers, educational websites, and Internet-based resources being the most accessible. The teachers also used digital resources for teaching to a high extent, particularly for information searching, lesson preparation, and accessing teaching materials. Major challenges included inadequate electricity supply (91.3%), poor Internet connectivity (89.2%), high data costs (85.9%), limited access to digital devices (82.0%), inadequate training (80.5%), and lack of technical support (77.2%). A significant positive relationship existed between digital literacy skills and digital resource utilisation (<math>r = 0.682</math>, <math>p &lt; 0.05</math>), while utilisation significantly differed according to teachers' digital literacy levels (<math>F(2,331) = 18.764</math>, <math>p &lt; 0.05</math>). The study concluded that effective digital integration was constrained by low digital literacy and infrastructural, financial, technical, and training-related challenges. Regular digital literacy training, improved infrastructure, affordable connectivity, access to devices, and continuous technical support were recommended.</i></p> <p><b>Keywords:</b> Digital literacy, digital resources, primary school teachers, technology utilisation, primary education.</p> |
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## Introduction

The rapid advancement of information and communication technologies has transformed education and created new expectations for teachers to possess the knowledge and skills required to access, evaluate, create, and use digital information effectively. Digital literacy is therefore no

longer limited to the ability to operate a computer or access the Internet; it encompasses the knowledge, skills, and attitudes required for the confident, critical, and responsible use of digital technologies for learning, work, and participation in society (European Commission, 2025;

UNESCO Institute for Statistics, 2018). In contemporary education, digitally literate teachers are expected to search for information, evaluate digital content, communicate and collaborate through digital platforms, create and adapt digital materials, and use digital technologies to support teaching, assessment, and professional development. This makes digital literacy an important component of contemporary teacher competence and a necessary foundation for effective participation in technology-supported education.

The importance of teachers' digital literacy is particularly evident in primary education, where teachers play a fundamental role in developing learners' foundational knowledge, skills, attitudes, and early digital competencies. Digital resources can provide teachers with access to curriculum materials, electronic textbooks, videos, images, interactive learning materials, online information, assessment resources, and professional development opportunities. The European Framework for the Digital Competence of Educators (DigCompEdu) conceptualises teacher digital competence as extending beyond technical skills to include the ability to select, create, manage, and share digital resources and to use digital technologies to enhance teaching, learning, assessment, learner engagement, and the development of learners' own digital competence (European Commission, 2022). Similarly, research has shown that digital resources constitute an important dimension of teachers' professional digital competence, although the concept encompasses diverse forms of knowledge and skills required for their effective educational use (Heine et al., 2023).

The increasing availability of digital resources has also influenced educational practice in Nigeria. The Federal Ministry of Education has developed digital platforms such as eLearn to provide teachers with access to curriculum-aligned educational resources, including texts, videos, interactive exercises, quizzes, and professional development materials (Federal Ministry of Education, 2026). Similarly, the Nigeria Learning Passport has expanded access to digital learning resources and has been used to support learners and teachers in different educational contexts. However, the existence of digital platforms and resources does not automatically guarantee their effective use. UNICEF (2025) reported that only 47% of teachers in Nigeria possessed basic ICT skills, while limited digital infrastructure and Internet access continued to constrain digital learning. This situation highlights the importance of examining not only the availability of digital resources but also teachers' ability to access, evaluate, and use them meaningfully in educational practice.

The effective use of digital resources in primary education is therefore closely related to the digital literacy

competencies of teachers. A teacher may have access to computers, smartphones, Internet services, or online educational platforms but may not necessarily possess the skills required to identify reliable information, select appropriate digital materials, adapt resources to curriculum objectives, and integrate them effectively into classroom instruction. The DigCompEdu framework specifically emphasises the importance of selecting digital resources according to learning objectives, learner characteristics, pedagogical approaches, and educational context, while also highlighting the need for teachers to use digital technologies to enhance teaching and learning (European Commission, 2022). Consequently, digital literacy should be understood not merely as access to digital technology but as the capacity to use digital resources purposefully, critically, creatively, and pedagogically.

The importance of this issue is further reinforced by the continuing challenges facing the Nigerian education system. UNICEF (2025) reported that Nigeria faces a serious learning crisis, with weak teacher capacity and inadequate professional development opportunities contributing to poor learning outcomes. The organisation also identified limited Internet access, inadequate digital infrastructure, and low levels of basic ICT skills among teachers as important challenges to the effective expansion of digital learning. These challenges suggest that the successful integration of digital resources into primary education requires more than the provision of technological infrastructure; it requires continuous development of teachers' digital competencies and appropriate institutional support. In Jigawa State, where primary school teachers operate within diverse educational environments and may experience differences in access to digital devices, connectivity, training, and technical support, assessing their digital literacy skills and use of digital resources is therefore particularly important.

Against this background, this study focuses on the assessment of digital literacy skills and the use of digital resources for teaching among primary school teachers in Jigawa State. The study is guided by the Digital Competence Framework for Educators (DigCompEdu) and the Technology Acceptance Model (TAM). DigCompEdu provides a framework for examining the digital competencies required by teachers, including professional engagement, management and use of digital resources, teaching and learning, assessment, learner empowerment, and the facilitation of learners' digital competence (European Commission, 2022). TAM, developed by Davis (1989), provides a complementary explanation of technology use by proposing that perceived usefulness and perceived ease of use influence an individual's acceptance and actual use of a technology. Together, these theories

provide a useful basis for examining both what digital competencies teachers possess and why they may or may not use available digital resources for teaching. The study is expected to provide empirical evidence that can assist education authorities, school administrators, and teacher educators in identifying digital literacy needs, strengthening professional development, improving access to digital resources, and promoting the effective integration of digital technologies into primary education.

### Research Objectives

1. To assess the level of digital literacy skills among primary school teachers in Jigawa State.
2. To identify the types of digital resources available to primary school teachers for teaching in Jigawa State.
3. To determine the extent to which primary school teachers in Jigawa State use digital resources for teaching.
4. To identify the challenges hindering the effective use of digital resources among primary school teachers in Jigawa State.

### Hypotheses

1. **H<sub>01</sub>:** There is no statistically significant relationship between the level of digital literacy skills and the use of digital resources for teaching among primary school teachers in Jigawa State.
2. **H<sub>02</sub>:** There is no statistically significant difference in the use of digital resources for teaching among primary school teachers in Jigawa State based on their level of digital literacy skills.

### Literature Review

Digital literacy refers to the ability to access, evaluate, manage, create, and use digital information and technologies effectively, critically, safely, and responsibly. For primary school teachers, digital literacy includes the ability to search for educational information, evaluate online content, use digital tools, create or adapt instructional materials, and apply digital technologies to support teaching and professional activities (UNESCO Institute for Statistics, 2018; European Commission, 2022). Research indicates that teachers' digital competence is multidimensional and extends beyond basic technical skills to include the effective pedagogical use of digital technologies and resources (Heine et al., 2023; Nguyen & Habók, 2024).

Digital resources include electronic textbooks, educational websites, digital libraries, online databases, videos, multimedia materials, mobile applications, learning platforms, online assessment tools, and other electronically

accessible instructional materials. Their use can expand teachers' access to instructional content, support lesson preparation and delivery, facilitate learner engagement, and provide opportunities for professional development (UNESCO, 2023). However, the extent and type of digital resource use depend on teachers' digital competence, access to devices and connectivity, perceptions of usefulness and ease of use, and the availability of institutional support.

The use of digital resources is often hindered by inadequate digital devices, poor Internet connectivity, unreliable electricity, high costs, insufficient training, limited technical support, inadequate digital skills, and other institutional constraints (UNESCO, 2023). These challenges may be particularly relevant in developing educational contexts, where unequal access to infrastructure and professional development can limit teachers' ability to benefit from digital technologies.

The study is guided by the Digital Competence Framework for Educators (DigCompEdu) and the Technology Acceptance Model (TAM). DigCompEdu identifies the professional digital competencies required by educators, including the ability to use digital resources, apply digital technologies in teaching and learning, assess learners, and support digital competence development (European Commission, 2022). TAM explains technology use through users' perceptions of the usefulness and ease of use of a technology (Davis, 1989). Together, these frameworks provide a basis for examining the digital literacy skills of primary school teachers, their use and types of digital resources, and the factors that may hinder effective utilisation in Jigawa State.

### Methodology

The study adopted a quantitative approach using a cross-sectional survey design. The population comprised 2,912 primary school teachers across the 27 Local Government Areas of Jigawa State, from which a sample of 334 teachers was determined using the Taro Yamane formula. A multistage sampling technique, involving the selection of Local Government Areas, primary schools, and teachers, was employed, with proportionate sampling used to ensure adequate representation. Data were collected using a structured questionnaire based on the study objectives and relevant literature, with items measured using a five-point Likert scale and appropriate response options for assessing the frequency and extent of digital resource utilisation. The data were analysed using SPSS Version 27.0 through frequencies, percentages, means, and standard deviations, while a decision mean of 3.00 was adopted for interpreting the Likert-scale responses.

## Ethical Considerations

Ethical principles were observed throughout the study. Permission to conduct the research was obtained from the relevant educational authorities and school administrators. Participation in the study was voluntary, and respondents were informed about the purpose of the research before completing the questionnaire. The respondents' anonymity and confidentiality were maintained, and the information collected was used strictly for academic purposes.

## Data Analysis and Interpretation

**Research Objective One: To assess the level of digital literacy skills among primary school teachers in Jigawa State.**

**Decision rule:** Mean scores of 3.00 and above = High digital literacy skill, while mean scores below 3.00 = Low digital literacy skill. N = 334

*Table 1: Level of digital literacy skills*

| S/N | Skills                                                                                           | SA (%)     | A (%)      | UD (%)     | D (%)       | SD (%)     | Mean        | SD          | Decision   |
|-----|--------------------------------------------------------------------------------------------------|------------|------------|------------|-------------|------------|-------------|-------------|------------|
| 1   | I can operate a computer or other digital device for teaching-related activities.                | 45 (13.5%) | 72 (21.6%) | 34 (10.2%) | 103 (30.8%) | 80 (24.0%) | 2.7         | 1.4         | Low        |
| 2   | I can search for relevant educational information on the Internet.                               | 52 (15.6%) | 78 (23.4%) | 39 (11.7%) | 95 (28.4%)  | 70 (21.0%) | 2.84        | 1.4         | Low        |
| 3   | I can evaluate the accuracy and credibility of digital information before using it for teaching. | 38 (11.4%) | 66 (19.8%) | 47 (14.1%) | 106 (31.7%) | 77 (23.1%) | 2.65        | 1.37        | Low        |
| 4   | I can download, save, organise, and retrieve digital teaching materials.                         | 42 (12.6%) | 73 (21.9%) | 41 (12.3%) | 101 (30.2%) | 77 (23.1%) | 2.71        | 1.39        | Low        |
| 5   | I can use digital applications and software to prepare teaching materials.                       | 35 (10.5%) | 64 (19.2%) | 43 (12.9%) | 108 (32.3%) | 84 (25.1%) | 2.58        | 1.36        | Low        |
| 6   | I can communicate and share information through digital platforms.                               | 49 (14.7%) | 75 (22.5%) | 40 (12.0%) | 98 (29.3%)  | 72 (21.6%) | 2.79        | 1.4         | Low        |
| 7   | I can solve basic problems encountered when using digital technologies.                          | 31 (9.3%)  | 58 (17.4%) | 51 (15.3%) | 111 (33.2%) | 83 (24.9%) | 2.53        | 1.34        | Low        |
| 8   | I can create or modify digital content for use in teaching.                                      | 29 (8.7%)  | 55 (16.5%) | 48 (14.4%) | 116 (34.7%) | 86 (25.7%) | 2.48        | 1.32        | Low        |
| 9   | I understand how to use digital technologies safely and responsibly.                             | 46 (13.8%) | 71 (21.3%) | 44 (13.2%) | 102 (30.5%) | 71 (21.3%) | 2.76        | 1.39        | Low        |
| 10  | I can independently learn how to use new digital tools and technologies.                         | 34 (10.2%) | 62 (18.6%) | 49 (14.7%) | 108 (32.3%) | 81 (24.3%) | 2.58        | 1.36        | Low        |
|     | <b>Overall Mean</b>                                                                              |            |            |            |             |            | <b>2.66</b> | <b>1.37</b> | <b>Low</b> |

The results presented in Table 1 indicate that the primary school teachers demonstrated a low level of digital literacy skills, as reflected by the overall mean score of 2.66. All ten items recorded mean scores below the decision mean of 3.00, indicating that the respondents generally lacked adequate confidence and competence in operating digital

devices, searching for and evaluating digital information, managing digital materials, using digital applications, creating digital content, solving basic technological problems, and learning new digital tools independently. The lowest mean score was recorded for the ability to create or modify digital content for teaching (M = 2.48), while the



highest was recorded for the ability to search for relevant educational information on the Internet ( $M = 2.84$ ). Overall, the findings suggest that although primary school teachers may have some basic exposure to digital technologies, their digital literacy skills were generally inadequate for the effective and independent use of digital resources in teaching.

**Research Objective Two: To identify the types of digital resources available to primary school teachers for teaching in Jigawa State.**

**Decision rule:** Mean scores of **3.00 and above** = **Available**, while mean scores **below 3.00** = **Not Available**. **N = 334**

*Table 2: Types of digital resources available to primary school teachers*

| S/N | Digital Resources                           | SA (%)         | A (%)          | UD (%)        | D (%)         | SD (%)        | Mean        | SD          | Decision         |
|-----|---------------------------------------------|----------------|----------------|---------------|---------------|---------------|-------------|-------------|------------------|
| 1   | Smartphones/mobile phones                   | 142<br>(42.5%) | 126<br>(37.7%) | 18<br>(5.4%)  | 30<br>(9.0%)  | 18<br>(5.4%)  | 4.03        | 1.23        | Available        |
| 2   | Computers/laptops                           | 112<br>(33.5%) | 135<br>(40.4%) | 21<br>(6.3%)  | 40<br>(12.0%) | 26<br>(7.8%)  | 3.8         | 1.3         | Available        |
| 3   | Internet/online educational resources       | 105<br>(31.4%) | 139<br>(41.6%) | 24<br>(7.2%)  | 42<br>(12.6%) | 24<br>(7.2%)  | 3.77        | 1.27        | Available        |
| 4   | Educational websites                        | 98<br>(29.3%)  | 142<br>(42.5%) | 27<br>(8.1%)  | 43<br>(12.9%) | 24<br>(7.2%)  | 3.74        | 1.25        | Available        |
| 5   | Educational videos and multimedia materials | 91<br>(27.2%)  | 137<br>(41.0%) | 29<br>(8.7%)  | 48<br>(14.4%) | 29<br>(8.7%)  | 3.64        | 1.3         | Available        |
| 6   | Electronic books and digital textbooks      | 76<br>(22.8%)  | 128<br>(38.3%) | 34<br>(10.2%) | 58<br>(17.4%) | 38<br>(11.4%) | 3.44        | 1.35        | Available        |
| 7   | Online search engines                       | 118<br>(35.3%) | 145<br>(43.4%) | 20<br>(6.0%)  | 32<br>(9.6%)  | 19<br>(5.7%)  | 3.93        | 1.21        | Available        |
| 8   | Digital libraries and online databases      | 54<br>(16.2%)  | 91<br>(27.2%)  | 48<br>(14.4%) | 79<br>(23.7%) | 62<br>(18.6%) | 2.99        | 1.4         | Not Available    |
| 9   | Educational mobile applications             | 69<br>(20.7%)  | 121<br>(36.2%) | 38<br>(11.4%) | 66<br>(19.8%) | 40<br>(12.0%) | 3.34        | 1.37        | Available        |
| 10  | Online learning platforms                   | 61<br>(18.3%)  | 108<br>(32.3%) | 43<br>(12.9%) | 73<br>(21.9%) | 49<br>(14.7%) | 3.17        | 1.4         | Available        |
|     | <b>Overall Mean</b>                         |                |                |               |               |               | <b>3.58</b> | <b>1.32</b> | <b>Available</b> |

The results presented in Table 2 indicate that digital resources were generally available to primary school teachers in Jigawa State, as shown by the overall mean score of 3.58, which was above the decision mean of 3.00. Smartphones recorded the highest mean score ( $M = 4.03$ ), followed by online search engines ( $M = 3.93$ ) and computers/laptops ( $M = 3.80$ ). Educational websites, Internet resources, multimedia materials, electronic books, educational mobile applications, and online learning platforms were also considered available. However, digital libraries and online databases recorded a mean score of 2.99, indicating that they were relatively less available.

Overall, the findings suggest that while several basic digital resources were available to primary school teachers, access to more specialised digital information resources remained limited.

**Research Objective Three: To determine the extent to which primary school teachers in Jigawa State use digital resources for teaching.**

**Decision rule:** Mean scores of **3.00 and above** = **High extent of use**, while mean scores **below 3.00** = **Low extent of use**. **N = 334**

*Table 3: Use of Digital Resources for Teaching*

| S/N | Use of Digital Resources                                                    | SA (%)         | A (%)          | UD (%)       | D (%)        | SD (%)       | Mean | SD   | Decision |
|-----|-----------------------------------------------------------------------------|----------------|----------------|--------------|--------------|--------------|------|------|----------|
| 1   | I use digital resources to prepare lesson plans and teaching materials.     | 126<br>(37.7%) | 139<br>(41.6%) | 18<br>(5.4%) | 32<br>(9.6%) | 19<br>(5.7%) | 3.96 | 1.22 | High     |
| 2   | I use digital resources to search for information related to lesson topics. | 138<br>(41.3%) | 135<br>(40.4%) | 16<br>(4.8%) | 28<br>(8.4%) | 17<br>(5.1%) | 4.05 | 1.18 | High     |

|    |                                                                                     |                |                |               |               |               |             |             |             |
|----|-------------------------------------------------------------------------------------|----------------|----------------|---------------|---------------|---------------|-------------|-------------|-------------|
| 3  | I use educational websites to obtain teaching and learning materials.               | 104<br>(31.1%) | 141<br>(42.2%) | 25<br>(7.5%)  | 42<br>(12.6%) | 22<br>(6.6%)  | 3.79        | 1.26        | High        |
| 4  | I use educational videos and multimedia materials to support classroom instruction. | 96<br>(28.7%)  | 132<br>(39.5%) | 29<br>(8.7%)  | 48<br>(14.4%) | 29<br>(8.7%)  | 3.65        | 1.32        | High        |
| 5  | I use smartphones or computers to access digital teaching resources.                | 145<br>(43.4%) | 128<br>(38.3%) | 17<br>(5.1%)  | 28<br>(8.4%)  | 16<br>(4.8%)  | 4.07        | 1.17        | High        |
| 6  | I use digital resources to update my knowledge of subjects and teaching methods.    | 112<br>(33.5%) | 137<br>(41.0%) | 24<br>(7.2%)  | 39<br>(11.7%) | 22<br>(6.6%)  | 3.83        | 1.25        | High        |
| 7  | I use digital resources to obtain examples, illustrations, and teaching aids.       | 108<br>(32.3%) | 143<br>(42.8%) | 22<br>(6.6%)  | 39<br>(11.7%) | 22<br>(6.6%)  | 3.83        | 1.24        | High        |
| 8  | I use digital resources to communicate or share teaching materials with colleagues. | 87<br>(26.0%)  | 126<br>(37.7%) | 31<br>(9.3%)  | 56<br>(16.8%) | 34<br>(10.2%) | 3.53        | 1.38        | High        |
| 9  | I use digital resources to assess or provide feedback to pupils.                    | 62<br>(18.6%)  | 101<br>(30.2%) | 39<br>(11.7%) | 78<br>(23.4%) | 54<br>(16.2%) | 3.12        | 1.43        | High        |
| 10 | I regularly integrate digital resources into my classroom teaching.                 | 73<br>(21.9%)  | 118<br>(35.3%) | 35<br>(10.5%) | 66<br>(19.8%) | 42<br>(12.6%) | 3.34        | 1.42        | High        |
|    | <b>Overall Mean</b>                                                                 |                |                |               |               |               | <b>3.72</b> | <b>1.29</b> | <b>High</b> |

The results presented in Table 3 indicate that primary school teachers in Jigawa State used digital resources for teaching to a high extent, as shown by the overall mean score of 3.72, which exceeded the decision mean of 3.00. The highest level of use was recorded for accessing digital resources through smartphones or computers ( $M = 4.07$ ), followed by searching for information related to lesson topics ( $M = 4.05$ ) and preparing lesson plans and teaching materials ( $M = 3.96$ ). The lowest mean score was recorded for using digital resources to assess or provide feedback to

pupils ( $M = 3.12$ ), although this still indicated a high extent of use. Overall, the findings suggest that despite the teachers' relatively low digital literacy skills, they made considerable use of available digital resources, particularly for information searching, lesson preparation, and accessing teaching materials.

**Research Objective Four: To identify the challenges hindering the effective use of digital resources among primary school teachers in Jigawa State.  $N = 334$**

**Table 4: Challenges**

| S/N | Challenges                                                                 | Yes, f (%)  | No, f (%)   |
|-----|----------------------------------------------------------------------------|-------------|-------------|
| 1   | Poor or unreliable Internet connectivity                                   | 298 (89.2%) | 36 (10.8%)  |
| 2   | Inadequate electricity supply                                              | 305 (91.3%) | 29 (8.7%)   |
| 3   | High cost of Internet data                                                 | 287 (85.9%) | 47 (14.1%)  |
| 4   | Limited access to computers and Internet-enabled devices                   | 274 (82.0%) | 60 (18.0%)  |
| 5   | Inadequate training in the use of digital technologies                     | 269 (80.5%) | 65 (19.5%)  |
| 6   | Lack of technical support when using digital technologies                  | 258 (77.2%) | 76 (22.8%)  |
| 7   | Limited knowledge of advanced digital tools and applications               | 251 (75.1%) | 83 (24.9%)  |
| 8   | Lack of adequate time to search for and prepare digital teaching materials | 238 (71.3%) | 96 (28.7%)  |
| 9   | Difficulty in evaluating the reliability of online information             | 226 (67.7%) | 108 (32.3%) |
| 10  | Information overload when searching for digital teaching materials         | 219 (65.6%) | 115 (34.4%) |

The results indicate that primary school teachers in Jigawa State faced several challenges in the effective use of digital resources. Inadequate electricity supply was the most widely reported challenge, identified by 305 respondents (91.3%), followed by poor or unreliable Internet connectivity with 298 respondents (89.2%) and the high

cost of Internet data with 287 respondents (85.9%). Other major challenges included limited access to digital devices (82.0%), inadequate training (80.5%), lack of technical support (77.2%), and limited knowledge of advanced digital tools (75.1%). Difficulty in evaluating online information and information overload were reported by

67.7% and 65.6% of the respondents, respectively. Overall, the findings show that infrastructural, financial, technical, training-related, and information-related factors constituted significant barriers to the effective use of digital resources among primary school teachers in Jigawa State.

### Hypothesis One

| Variables                                            | N   | Pearson r | Sig. (p-value) | Decision               |
|------------------------------------------------------|-----|-----------|----------------|------------------------|
| Digital literacy skills and use of digital resources | 334 | 0.682**   | 0.000          | Reject H <sub>01</sub> |

**Interpretation:** The results indicate a positive and statistically significant relationship between digital literacy skills and the use of digital resources for teaching among primary school teachers in Jigawa State ( $r = 0.682$ ,  $p < 0.05$ ). This implies that teachers with higher digital literacy skills tended to use digital resources more extensively for teaching. Since the p-value of 0.000 was less than the 0.05 level of significance, the null hypothesis was **rejected**. Therefore, there was a statistically significant relationship between digital literacy skills and the use of digital resources for teaching.

| Source of Variation | Sum of Squares | df         | Mean Square | F      | Sig. (p-value) | Decision               |
|---------------------|----------------|------------|-------------|--------|----------------|------------------------|
| Between Groups      | 42.681         | 2          | 21.341      | 18.764 | 0.000          | Reject H <sub>02</sub> |
| Within Groups       | 376.224        | 331        | 1.137       |        |                |                        |
| <b>Total</b>        | <b>418.905</b> | <b>333</b> |             |        |                |                        |

**Interpretation:** The results indicate a statistically significant difference in the extent of use of digital resources for teaching among primary school teachers based on their level of digital literacy skills ( $F(2,331) = 18.764$ ,  $p < 0.05$ ). Since the p-value of 0.000 was less than the 0.05 level of significance, the null hypothesis was **rejected**. This indicates that teachers with different levels of digital literacy skills differed significantly in their use of digital resources for teaching. In general, teachers with higher digital literacy skills were more likely to use digital resources extensively than those with lower digital literacy skills.

Both null hypotheses were rejected. The findings suggest that digital literacy skills are significantly related to and influence the effective use of digital resources for teaching among primary school teachers in Jigawa State. This implies that improving teachers' digital literacy through regular training and professional development may contribute to more effective utilisation of digital resources in primary school teaching.

### Discussion of Findings

The first objective assessed the level of digital literacy skills among primary school teachers in Jigawa State. The

**H<sub>01</sub>:** There is no statistically significant relationship between the level of digital literacy skills and the use of digital resources for teaching among primary school teachers in Jigawa State.

**Statistical test:** Pearson Product-Moment Correlation

**Level of significance:** 0.05

### Hypothesis Two

**H<sub>02</sub>:** There is no statistically significant difference in the use of digital resources for teaching among primary school teachers in Jigawa State based on their level of digital literacy skills.

**Statistical test:** One-Way Analysis of Variance (ANOVA)

**Level of significance:** 0.05

findings revealed a generally low level of digital literacy, with an overall mean of 2.66, below the decision mean of 3.00. The teachers recorded relatively better competence in searching for educational information online ( $M = 2.84$ ) and operating digital devices ( $M = 2.70$ ), but demonstrated weaker skills in creating or modifying digital content ( $M = 2.48$ ), solving basic technological problems ( $M = 2.53$ ), and independently learning new digital tools ( $M = 2.58$ ).

This finding suggests that the teachers' digital competence was largely at a basic or functional level rather than at a level that supports the creative, critical, and pedagogical integration of technology. The result is significant because digital competence in education is not limited to operating devices; it includes selecting, evaluating, creating, managing, and using digital resources to improve teaching and learning. The DigCompEdu framework specifically identifies digital resources, teaching and learning, assessment, professional engagement, and digital problem-solving as core areas of educator competence.

The finding may also be explained through the Digital Competence Framework for Educators (DigCompEdu). From this theoretical perspective, the teachers appear to possess some foundational digital abilities but have not

sufficiently developed the higher-level competences required for the effective creation, modification, critical evaluation, and pedagogical integration of digital content. The implication is that access to digital technologies alone is insufficient; teachers require systematic professional development that progresses from basic operational skills to more advanced pedagogical and information competencies. This interpretation is also consistent with the emergence of context-sensitive digital competency frameworks for Sub-Saharan Africa, which recognise that teachers in low-connectivity and resource-constrained settings require competencies adapted to their actual working environments.

The second objective examined the types of digital resources available to primary school teachers. The findings showed that digital resources were generally available, with an overall mean of 3.58. Smartphones ( $M = 4.03$ ), online search engines ( $M = 3.93$ ), computers/laptops ( $M = 3.80$ ), educational websites ( $M = 3.74$ ), and Internet-based educational resources ( $M = 3.77$ ) were the most available. However, digital libraries and online databases recorded a mean of **2.99**, indicating relatively limited availability.

This finding indicates that the digital environment of primary school teachers is characterised more by access to commonly available and personally accessible technologies than by access to specialised educational information infrastructures. The high availability of smartphones is particularly understandable because mobile devices are generally more accessible and flexible than institutional computer facilities. However, the lower availability of digital libraries and online databases suggests that teachers may have limited access to structured, authoritative, and professionally curated educational information resources.

The finding also reflects an important distinction between availability and effective educational integration. The DigCompEdu framework emphasises that educators should be able not only to access digital resources but also to identify, assess, select, create, manage, protect, and share appropriate resources according to learning objectives and learner needs. Thus, although the present study found that digital resources were generally available, the low level of digital literacy found under Objective One may limit the extent to which teachers can exploit the full educational value of those resources.

The third objective determined the extent to which primary school teachers used digital resources for teaching. The findings revealed a high extent of utilisation, with an overall mean of 3.72. The highest use was recorded for accessing digital resources through smartphones and computers ( $M = 4.07$ ), searching for information related to lesson topics ( $M = 4.05$ ), and preparing lesson plans and

teaching materials ( $M = 3.96$ ). The lowest use was recorded for using digital resources to assess or provide feedback to pupils ( $M = 3.12$ ).

The finding suggests that primary school teachers have incorporated digital resources particularly into the preparatory and information-gathering dimensions of teaching. In other words, digital technology appears to be used primarily to find information, prepare lessons, and obtain instructional materials. However, its use is less intensive in more advanced pedagogical activities such as digital assessment, feedback, and systematic classroom integration. This pattern is important because it suggests that the use of technology has not necessarily developed into comprehensive digital pedagogy.

The difference between the low level of digital literacy and the high extent of digital resource use is particularly noteworthy. It suggests that teachers may be using digital resources at a functional level despite lacking advanced digital competence. For example, a teacher may be able to search for teaching materials using a smartphone without possessing the skills required to critically evaluate the source, adapt the material, create original digital content, or integrate it into a structured digital learning activity. This interpretation is consistent with DigCompEdu's distinction between simply using technology and using it to enhance and innovate teaching and learning.

The finding can also be interpreted through the Technology Acceptance Model (TAM). The relatively high use of smartphones, search engines, websites, and online materials may indicate that teachers perceive these technologies as useful for lesson preparation and access to information. Their frequent use may also suggest that these resources are perceived as relatively easy to access and operate. However, the lower use of digital resources for assessment and feedback may indicate lower perceived usefulness, lower confidence, inadequate skills, or insufficient supporting conditions for more advanced applications. In this regard, technology acceptance is not necessarily equivalent to advanced digital competence.

The fourth objective identified the challenges hindering the effective use of digital resources. The findings revealed that teachers experienced substantial challenges. Inadequate electricity supply was the most frequently reported challenge (91.3%), followed by poor or unreliable Internet connectivity (89.2%), high Internet data costs (85.9%), limited access to digital devices (82.0%), inadequate training (80.5%), and lack of technical support (77.2%). Other important challenges included limited knowledge of advanced digital tools (75.1%), lack of time (71.3%), difficulty evaluating online information (67.7%), and information overload (65.6%).



These findings indicate that the barriers to digital resource use are multidimensional. The problem is not simply a lack of willingness on the part of teachers. Rather, the effective use of digital resources is constrained by a combination of infrastructural, financial, technical, professional, and information-literacy challenges. The particularly high percentages associated with electricity, Internet connectivity, and data costs demonstrate that the digital transformation of teaching cannot be achieved through teacher training alone. Teachers may possess the motivation and basic skills to use technology, but unreliable infrastructure and unaffordable connectivity can substantially limit consistent use.

This finding is consistent with the broader international evidence that technology in education is shaped by the conditions under which it is introduced. UNESCO has emphasised that technology can support education, but its benefits are not automatic and may be limited by unequal access, inadequate infrastructure, weak preparation, and insufficient support. The 2023 Global Education Monitoring Report consequently stresses that technology should be used on appropriate educational terms rather than treated as an automatic solution to educational challenges.

The challenges identified also provide an important explanation for the apparent contradiction between high digital-resource use and low digital literacy skills. Teachers may use digital tools frequently because they have access to simple and familiar applications, particularly smartphones and search engines, while still lacking the skills required for more complex digital activities. Similarly, teachers may be willing to use digital resources but may be unable to do so consistently because of unreliable electricity, expensive data, or poor connectivity. Thus, the findings suggest that digital resource utilisation should be understood as the outcome of an interaction between teacher competence, perceived usefulness, ease of use, and facilitating conditions.

Hypothesis one was rejected because the results indicated a positive and statistically significant relationship between digital literacy skills and the use of digital resources ( $r = 0.682$ ,  $p < 0.05$ ). This finding means that teachers with higher digital literacy skills tended to use digital resources more extensively for teaching. The strength of the relationship further suggests that digital competence is an important factor in determining the effective use of digital technologies in primary education.

The finding is theoretically consistent with DigCompEdu, which conceptualises digital competence as the ability to use digital technologies purposefully for professional engagement, resource management, teaching, learning, and assessment. It is also consistent with TAM, which suggests that users who perceive technology as useful and

manageable are more likely to adopt and use it. In the context of this study, teachers with stronger digital skills are likely to perceive digital resources as easier to use and more useful for lesson preparation and instructional activities.

The result also provides an important empirical explanation for the study's findings. Although digital resources were generally available and their reported use was high, the low level of digital literacy indicates that the extent and quality of use may be limited by teachers' competence. Therefore, improving digital literacy is likely to increase not only the frequency of use but also the quality, diversity, and pedagogical sophistication of digital resource utilisation.

Hypothesis two was also rejected, as the ANOVA results indicated a statistically significant difference in the use of digital resources among teachers with different levels of digital literacy ( $F(2,331) = 18.764$ ,  $p < 0.05$ ). This finding indicates that digital literacy level differentiates teachers in terms of how extensively they use digital resources for teaching. Teachers with higher digital literacy were generally more likely to use digital resources extensively than teachers with lower digital literacy.

This finding reinforces the first hypothesis and suggests that digital literacy is not merely associated with digital-resource use but may also be an important factor distinguishing levels of utilisation. From the perspective of DigCompEdu, teachers with more developed digital competencies are better positioned to select appropriate resources, create and modify digital content, manage digital materials, and integrate technologies into teaching and learning. From the perspective of TAM, differences in competence may influence perceived ease of use and perceived usefulness, which in turn affect actual technology use.

The finding also suggests that uniform provision of digital resources may not produce uniform patterns of use among teachers. If teachers possess different levels of digital literacy, the same technology may be used differently by different teachers. Consequently, interventions should not focus solely on providing devices and Internet access; they should also include differentiated training that responds to teachers' existing levels of competence.

Taken together, the findings present a clear picture of digital resource use among primary school teachers in Jigawa State. Digital resources were generally available and were used to a high extent, particularly for accessing information and preparing lessons. However, the teachers' digital literacy skills were generally low, while infrastructural, financial, technical, and training-related challenges were substantial. This suggests that the presence of technology does not automatically produce digital competence or effective pedagogical integration.

The most important inference from the study is that availability, use, competence, and effective integration are distinct but interconnected dimensions of digital technology adoption. Teachers may have access to smartphones, search engines, websites, and online resources and may use them frequently, yet still lack the ability to critically evaluate information, create digital content, solve technological problems, and use digital resources for advanced teaching and assessment. The findings therefore support a shift from a narrow emphasis on technology provision towards a more comprehensive approach combining infrastructure, affordable connectivity, continuous professional development, technical support, and information and digital literacy training.

The two theoretical perspectives reinforce this conclusion. DigCompEdu explains the competencies teachers need to use digital technologies effectively for professional and pedagogical purposes, while TAM helps explain why teachers may accept and use certain technologies based on their perceived usefulness and ease of use. Together, the theories suggest that effective digital integration requires both competence and acceptance, supported by favourable

environmental conditions. Accordingly, the findings imply that improving digital teaching in Jigawa State primary schools will require simultaneous attention to teacher capacity, access to appropriate resources, perceived usefulness, ease of use, electricity, connectivity, data affordability, and technical support. This conclusion is particularly relevant to resource-constrained contexts, where digital education strategies must be adapted to actual infrastructural and professional realities rather than simply transferring models developed for high-connectivity environments.

### Conceptual Framework of the Study

The conceptual framework illustrates the relationship between digital literacy skills, availability of digital resources, utilisation of digital resources for teaching, and the challenges hindering effective use among primary school teachers in Jigawa State. The framework shows that teachers' digital literacy skills and access to relevant digital resources influence the extent to which they utilise digital resources for teaching. However, this utilisation is affected by infrastructural, financial, technical, and capacity-related challenges.

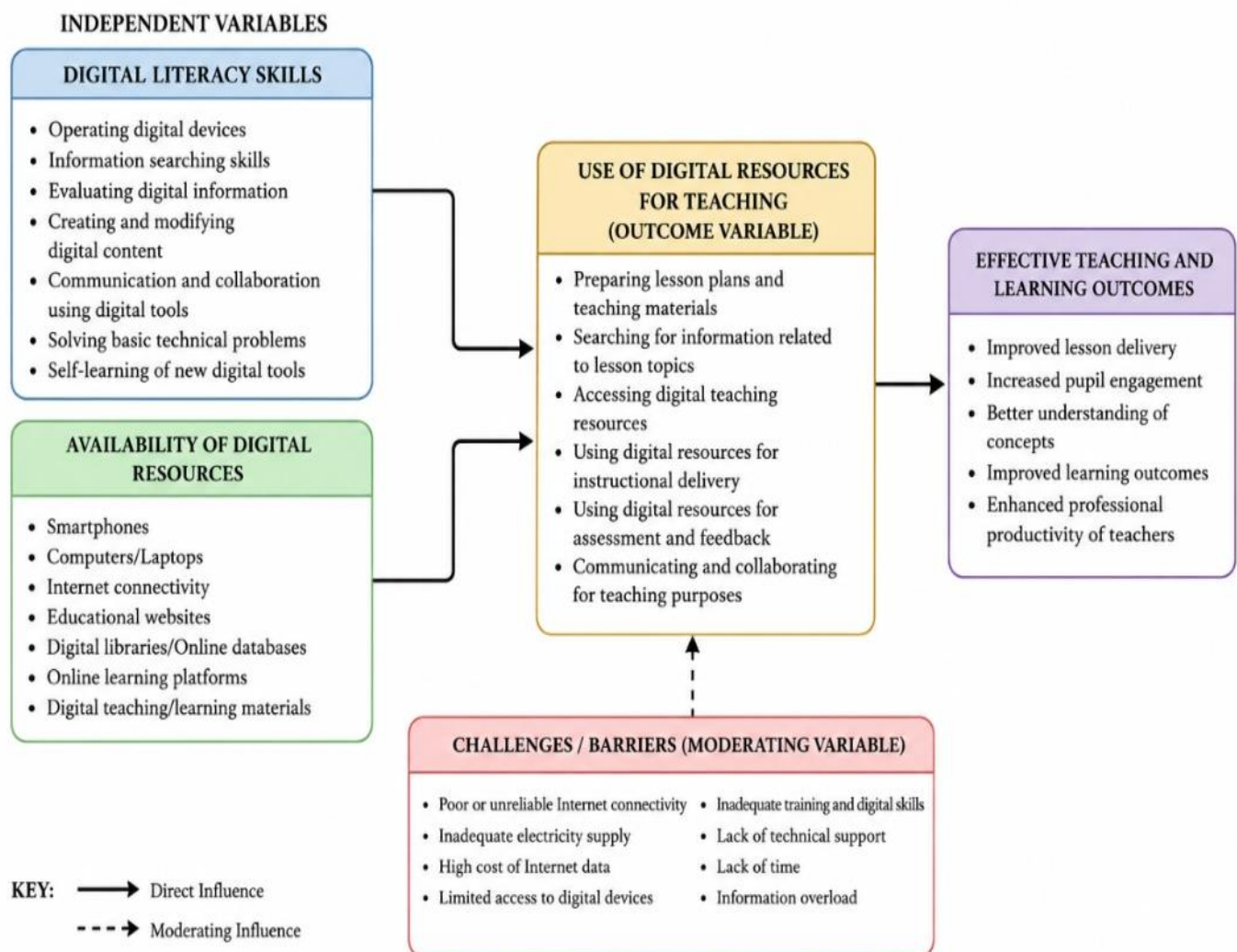


Figure 1: Conceptualization of the Study

The framework proposes that digital literacy skills constitute a major factor influencing teachers' ability to use digital resources effectively in teaching. Digital literacy goes beyond the ability to operate a computer or smartphone, as it includes the capacity to access, search, evaluate, create, manage, and communicate information using digital technologies. Teachers who possess adequate skills in operating digital devices are more likely to access and utilise available digital resources for instructional purposes. Similarly, the ability to search for relevant information enables teachers to locate suitable teaching materials and subject-related content. The ability to evaluate information is also important because not all online information is accurate, reliable, or appropriate for classroom use. Digital content creation skills enable teachers to adapt or develop instructional materials that are relevant to the needs of their pupils. In addition, basic technological problem-solving skills enable teachers to overcome minor difficulties encountered while using digital tools. Therefore, the framework assumes that teachers with higher levels of digital literacy are more likely to use digital resources confidently, independently, and effectively in their teaching activities. Conversely, inadequate digital literacy may limit teachers' ability to exploit the full educational potential of available technologies.

The framework also recognises the availability of digital resources as an important condition for their effective utilisation in teaching. The availability of smartphones, computers, laptops, Internet connectivity, educational websites, digital libraries, online databases, educational applications, and online learning platforms provides teachers with opportunities to access information and instructional materials. Where appropriate digital resources are available, teachers are more likely to incorporate them into lesson preparation, classroom instruction, professional development, and communication with colleagues. The availability of digital resources may also increase teachers' exposure to diverse teaching materials and contemporary information beyond what is contained in traditional textbooks. However, the mere availability of digital resources does not automatically guarantee their effective use. Teachers may have access to devices and online resources but lack the skills required to search for, evaluate, adapt, and apply them appropriately. Similarly, resources may be available in schools but remain underutilised because of poor Internet connectivity, inadequate electricity supply, high data costs, or lack of technical support. Therefore, the framework views availability as an important enabling condition that must interact with teachers' digital literacy skills to produce effective utilisation for teaching.

The use of digital resources for teaching represents the central outcome variable of the study. It refers to the extent to which primary school teachers employ digital technologies and electronic information resources to support different aspects of their professional and instructional responsibilities. This includes the use of digital resources for preparing lesson plans, searching for information related to lesson topics, obtaining examples and illustrations, accessing educational websites, and locating teaching and learning materials. It also includes the use of digital technologies to support instructional delivery, communication, collaboration, assessment, and the provision of feedback to pupils. The framework assumes that the effective use of digital resources can enrich the teaching process by providing teachers with access to current, diverse, interactive, and multimedia-based information. However, the quality and extent of use may vary depending on teachers' digital literacy skills and the availability of appropriate resources. Teachers with stronger digital competencies and better access to digital technologies are expected to use such resources more frequently and for a wider range of instructional activities. Consequently, the use of digital resources is positioned as the central outcome through which the influence of digital literacy and resource availability is examined.

Finally, the framework identifies challenges and barriers as contextual factors that may hinder the effective utilisation of digital resources among primary school teachers. These challenges may arise from infrastructural, financial, technical, professional, and information-related conditions within the teaching environment. Poor electricity supply may prevent teachers from charging and operating digital devices, while unreliable Internet connectivity may restrict access to online resources. The high cost of Internet data may further limit teachers' ability to access digital content regularly, particularly where teachers are required to bear the cost of connectivity themselves. Inadequate access to computers, smartphones, and other Internet-enabled devices may also restrict opportunities for digital resource use. In addition, insufficient training and lack of technical support may prevent teachers from developing the confidence and competence required to use digital technologies effectively. Other challenges, such as limited time, information overload, and difficulty evaluating the credibility of online information, may further affect effective utilisation. Thus, the framework assumes that digital resource utilisation is influenced by the interaction between teachers' digital literacy skills and the availability of resources, while infrastructural, financial, technical, and capacity-related challenges may constrain or weaken this relationship.

## Conclusion

The study concluded that digital resources were generally available to primary school teachers in Jigawa State and were used to a relatively high extent, particularly for searching for information, preparing lessons, and accessing teaching materials. However, the teachers demonstrated a generally low level of digital literacy skills, especially in digital content creation, technological problem-solving, and independent learning of new digital tools. The findings further revealed that inadequate electricity supply, poor Internet connectivity, high data costs, limited access to digital devices, inadequate training, and lack of technical support were major challenges affecting the effective use of digital resources.

The study also concluded that digital literacy skills were significantly related to the use of digital resources for teaching, with teachers possessing higher digital literacy skills tending to use digital resources more extensively. This indicates that improving access to digital technologies alone may not be sufficient to achieve effective digital integration in primary education. Sustainable improvement requires the simultaneous development of teachers' digital competencies, reliable infrastructure, affordable connectivity, and continuous institutional support.

## Recommendations

1. Regular digital literacy training should be organised for primary school teachers, focusing on information searching, evaluation, digital content creation, and basic troubleshooting.
2. The Government should improve electricity supply and Internet connectivity in primary schools to support reliable access to digital resources.
3. Affordable Internet access and improved access to digital devices should be provided through government and institutional support programmes.
4. Continuous technical support should be established to assist teachers in resolving challenges encountered when using digital technologies.
5. Digital resources should be systematically integrated into teacher professional development programmes to promote effective and sustainable use in teaching.

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