



International Journal of Research Publication and Reviews

Journal Homepage: www.ijrpr.com ISSN 2582-7421

Availability and Reliability of Internet Connectivity for Instructional Purposes in Primary Schools in Kyela District, Tanzania

Theckla Payovela¹, Dr. Frola Kasumba², Dr. Hebert Wanga³

¹Department of Education, University of Iringa, Tanzania Email: payovela82@gmail.com

²Faculty of Science and Education, Department of Education, University of Iringa (UoI) Email: frola.kasumba@uoi.ac.tz

³Faculty of Science and Education, Department of Education, University of Iringa (UoI) Email: wangahp@gmail.com

ABSTRACT

Reliable internet connectivity is increasingly important for teachers who use digital resources to prepare lessons, access instructional materials and enrich classroom practice. However, the educational value of internet technology depends on whether teachers can access it consistently and at an acceptable quality. This study assessed the availability and reliability of internet connectivity for instructional purposes in primary schools in Kyela District, Tanzania. The study used a quantitative approach supported by qualitative evidence and adopted a descriptive research design with a concurrent embedded mixed-methods orientation. The target population comprised approximately 420 primary school teachers and head teachers. A sample of 205 respondents was determined using Yamane's formula, of whom 187 provided usable questionnaire responses. In addition, 10 participants were purposively selected for interviews. Data were collected through questionnaires, interviews and documentary review and analysed using descriptive statistics and thematic analysis. The findings show that school-based internet access was very limited. Only 9.6% of respondents reported access to dedicated broadband or Wi-Fi, while 47.6% depended on personal mobile data and 42.8% had no internet access. Reliability was also poor: only 15.5% described their connection as good or very good, compared with 84.5% who reported fair, poor, or no connectivity. Personal smartphones were considerably more accessible than school-owned digital devices. The study concludes that the major constraint to internet-supported instruction in Kyela is not teachers' lack of interest alone, but a wider infrastructure gap involving connectivity, electricity, devices, affordability and technical support. Sustainable digital integration therefore requires institutional investment rather than continued dependence on teachers' personal resources.

Keywords: Internet connectivity, reliability, digital technology, instructional practices, primary education, Kyela District, Tanzania

1.0 Introduction

Digital technology has become an important part of contemporary education. Internet access can expand teachers' access to teaching materials, support lesson preparation, facilitate professional learning and provide opportunities for more engaging classroom practices. However, these benefits are realised only when connectivity is available, affordable and reliable.

In many rural schools, the challenge is not simply whether an internet signal exists, but whether teachers can depend on it when they need it. Weak network coverage, slow speeds, unreliable electricity, inadequate devices and the cost of mobile data can turn potentially useful technology into an impractical teaching resource. Evidence from Tanzania and other developing contexts suggests that such inequalities remain particularly pronounced between urban and rural schools (Mbawala, 2024; Mtebe & Raphael, 2023).

This study therefore focused on the availability and reliability of internet connectivity for instructional purposes in primary schools in Kyela District. The concern was not merely to establish whether teachers could access the internet, but whether the available connectivity was sufficiently dependable to support regular teaching activities.

2.0 Literature Review

2.1 Theoretical Literature Review

2.1.1 Technology Acceptance Model

The study was guided by the Technology Acceptance Model (TAM) developed by Davis (1989). The model explains technology adoption mainly through perceived usefulness and perceived ease of use. In an educational setting, teachers are more likely to use internet-based technologies when they believe that these technologies improve their teaching and can be used without excessive difficulty.

The model is useful in this study because teachers may recognise the value of internet resources while still being unable to use them consistently because of conditions beyond their immediate control. Unreliable connectivity, inadequate devices, high data costs and limited technical support can reduce both the usefulness and ease of use of technology (Krishnamoorthy & Tuan Soh, 2025; Mbawala, 2024). Thus, teachers' technology use should be understood within the material conditions in which teaching takes place.

2.2 Empirical Literature Review

Previous research consistently shows that rural schools face greater challenges in obtaining dependable internet services than their urban counterparts. Studies conducted in Tanzania and elsewhere in Africa identify inadequate infrastructure, limited access to devices, unreliable electricity, weak network coverage and affordability as major barriers to educational technology use (Shikomera, Mulwa & Mwanja, 2023; Namusisi & Nsubuga, 2022; Adu & Olatundun, 2021; Tella et al., 2022).

Tanzanian studies similarly indicate that access to digital technology remains uneven, particularly in rural settings (Mbawala, 2024; Mtebe & Raphael, 2023). However, much of the existing literature tends to treat internet access as a simple question of whether a school is connected. Less attention is given to the quality, consistency and practical reliability of that connection. This study addresses that gap by examining both availability and reliability at the school level in Kyela District.

3.0 Methodology

The study employed a quantitative approach supported by qualitative evidence. This approach was selected because the study required measurable evidence of internet availability, connectivity quality, access to digital devices and frequency of internet use, while qualitative accounts were necessary to explain the conditions underlying those patterns (Creswell & Creswell, 2018).

A descriptive research design with a concurrent embedded mixed-methods orientation was used. The design enabled the researcher to examine existing conditions without manipulating the study environment and to use interview evidence to deepen interpretation of the quantitative results (Kothari, 2004; Creswell & Creswell, 2018).

The study was conducted in Kyela District, Mbeya Region, an area characterised largely by rural communities and agricultural activities. The population comprised approximately 420 primary school teachers and head teachers. Using Yamane's (1967) formula at a 5% level of precision, a sample of 205 respondents was determined. Through multi-stage sampling, schools were selected to reflect geographical variation, followed by random selection of teachers. Ten head teachers and experienced teachers were purposively selected for interviews because of their knowledge of school ICT resources and internet use.

Primary data were collected using structured questionnaires, semi-structured interviews and documentary review. Questionnaires generated quantitative information on internet access, connectivity quality, digital devices and frequency of instructional use. Interviews explored practical experiences with connectivity, electricity, technical support and institutional arrangements. Documentary review was used to examine relevant school and district records and to strengthen triangulation.

Quantitative data were coded and analysed using descriptive statistics, particularly frequencies and percentages. Qualitative data were analysed thematically, with emerging themes used to explain and contextualise the statistical findings. The integration of the two forms of evidence enabled the study to move beyond simply reporting levels of access to explaining why internet use remained limited.

4.0 Results

4.1 Availability and Reliability of Internet Connectivity

The study examined four related aspects of connectivity: access to internet services, availability of digital devices, quality of connectivity and frequency of instructional use.

4.1.1 Internet Availability

Table 1: Availability of Internet Connection (n=187)

Internet access	Frequency	Percentage (%)
Dedicated broadband/Wi-Fi	18	9.6
Personal mobile data only	89	47.6
No internet access	80	42.8
Total	187	100.0

The results reveal a substantial institutional connectivity gap. Only 9.6% of respondents reported access to dedicated school broadband or Wi-Fi. Nearly half relied on personal mobile data, while 42.8% reported no internet access. In practical terms, this means that internet-supported instruction in many schools depends more on individual teachers than on school infrastructure.

4.1.2 Availability of Digital Devices

School-owned digital devices were also limited. Only 12.8% of respondents reported access to school-owned desktop computers, 5.9% to laptops, 3.7% to tablets and 2.7% to smart projectors. Computer laboratories were reported by only 7.5%. By contrast, 76.5% had access to personal smartphones.

This pattern is important because it shows that having a smartphone does not necessarily mean that a school is digitally equipped. Personal devices may provide some access to online resources, but they do not substitute for shared school infrastructure designed to support sustained instructional use.

4.1.3 Reliability of Internet Connectivity

Table 2: Quality of Internet Connectivity (n=187)

Connectivity quality	Frequency	Percentage (%)
Very good	8	4.3
Good	21	11.2
Fair	54	28.9
Poor	64	34.2
No internet	40	21.4
Total	187	100.0

Only 15.5% of respondents rated their connectivity as good or very good. The remaining 84.5% experienced fair, poor, or no connectivity. The implication is clear: even where internet access exists, it is frequently not dependable enough to support routine instructional activities.

4.1.4 Frequency of Internet Use for Teaching

Table 3: Frequency of Internet Use for Teaching (n=187)

Frequency	Frequency	Percentage (%)
Daily	19	10.2
Several times per week	31	16.6
Once per week	28	15.0
Once or twice per month	47	25.1
Rarely or never	62	33.2
Total	187	100.0

Only 26.8% of respondents used the internet daily or several times per week for teaching. At the other end of the scale, 33.2% rarely or never used it.

The interviews help explain this pattern. One head teacher reported that government-provided computers had remained unused for several years because the school lacked internet connectivity and technical support. A teacher described having to spend personal money on mobile data and travel towards a nearby market to obtain a stronger signal. Another head teacher reported that although a fibre connection had been discussed, implementation had not materialised and electricity remained a further obstacle.

5.0 Discussion of Findings

5.1 Availability and Reliability of Internet Connectivity

The findings demonstrate that internet-supported teaching in Kyela District is constrained primarily by infrastructure rather than technology awareness. With only 9.6% of respondents reporting dedicated school connectivity, most teachers either depended on personal mobile data or had no access at all. This finding is consistent with earlier evidence from Tanzania and other rural African contexts showing that teachers frequently compensate for inadequate institutional infrastructure through personal devices and privately purchased connectivity (Mbawala, 2024; Mtebe & Raphael, 2023; Shikomera, Mulwa & Mwania, 2023).

The dominance of personal smartphones further illustrates the individualisation of digital access. While smartphones offer a practical entry point to online resources, reliance on personal devices transfers the financial and technological burden of educational digitalisation to teachers. Such an arrangement is unlikely to provide equitable or sustainable access across schools.

Reliability presents an even more fundamental problem. More than four-fifths of respondents described their connection as fair, poor, or unavailable. A connection that repeatedly fails, operates at very low speed, or is accessible only from particular locations cannot easily support planned instructional activities. This distinction between having access and being able to depend on access is central to understanding the digital divide in rural schools.

The low frequency of internet use provides further evidence of this problem. Only 26.8% of teachers used the internet daily or several times a week, while one-third rarely or never did so. These findings suggest that teachers cannot consistently incorporate internet resources into their normal teaching routines.

From the perspective of TAM, teachers may perceive internet technology as useful, but perceived usefulness alone cannot overcome weak infrastructure. Where connectivity is unreliable, electricity is inadequate, devices are scarce and technical support is limited, even motivated teachers may find technology difficult to use. The findings therefore extend the interpretation of technology acceptance by showing that teachers' adoption decisions are embedded in the institutional and infrastructural environment in which they work.

The study consequently supports the broader argument that rural digital inequality is not simply a matter of whether teachers possess ICT skills. It is also a question of whether schools have the basic conditions necessary for those skills to be translated into practice.

6.0 Summary, Conclusion and Recommendations

6.1 Summary of Findings

The study found that internet connectivity for instructional purposes in Kyela primary schools was both limited and unreliable. Institutional connectivity was available to only 9.6% of respondents, while 47.6% depended on personal mobile data and 42.8% had no internet access.

School-owned digital infrastructure was similarly inadequate. Personal smartphones were widely available, but computers, laptops, tablets, projectors and computer laboratories were uncommon. This created a situation in which teachers' personal resources, rather than school infrastructure, became the main means of accessing online instructional materials.

Connectivity quality was also poor. Only 15.5% of respondents considered their internet connection good or very good, while 84.5% reported fair, poor, or no access. This was reflected in actual use: only 26.8% used the internet daily or several times a week, whereas 33.2% rarely or never used it for teaching.

Interview evidence reinforced the quantitative findings, particularly regarding weak network coverage, data costs, inadequate electricity, unused computers, limited technical support and delays in infrastructure development.

6.2 Conclusion

The study concludes that internet connectivity in primary schools in Kyela District is not yet sufficiently available, reliable, or institutionally supported to sustain regular internet-based instruction. The central problem is therefore broader than connectivity alone. It involves the interaction of network availability, reliability, electricity, digital devices, affordability and technical support.

The findings also suggest that teachers should not be viewed as the principal cause of low internet use. Many teachers appear willing to use digital resources but operate within an environment where the necessary infrastructure is inadequate. Improving digital education in rural primary schools therefore requires a shift from encouraging individual teachers to use technology towards building reliable institutional capacity for technology use.

For Kyela District, meaningful digital integration will depend on sustained investment in school connectivity, electricity, appropriate digital devices, technical maintenance and affordable internet access. Without these foundations, the promise of internet-supported teaching is likely to remain considerably greater than its practical reality.

6.3 Recommendations

To improve rural digital infrastructure: Expand reliable internet, electricity, affordable data, and access to essential digital devices in rural primary schools.

To build teachers' ICT skills: Provide regular practical training and technical support to help teachers use digital resources effectively in classroom teaching.

References

- Adu, E. O., & Olatundun, S. A. (2013). The use and management of ICT in schools: Strategies for school leaders. *European Journal of Computer Science and Information Technology*, 1(2), 10–16.
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative and mixed methods approaches* (5th ed.). SAGE Publications.

Kothari, C. R. (2004). *Research methodology: Methods and techniques* (2nd ed.). New Age International.

Krishnamoorthy, K., & Soh, T. M. T. (2021). Exploring the impact of internet accessibility in implementation of technology-based pedagogy for science in Malaysian primary schools. *International Journal of Academic Research in Progressive Education and Development*, 10(1), 339–353. <https://doi.org/10.6007/IJARPED/v10-i1/9042>

Mbawala, J. J., & Lestari, S. (2024). The use and challenges of ICT in primary schools: A study of selected primary schools in Ilala, Tanzania. *International Journal of Research and Innovation in Social Science*, 8(1), 1797–1807. <https://doi.org/10.47772/IJRIS.2024.801133>

Raphael, C., & Mtebe, J. S. (2024). Understanding teachers' technological and pedagogical knowledge at the University of Dar es Salaam in the new normal era: Situating teaching in the TPACK framework. *University of Dar es Salaam Library Journal*, 18(2), 136–156. <https://doi.org/10.4314/udslj.v18i2.11>

Shikomera, M. B., Mulwa, J. K., & Mwanja, J. M. (2023). The influence of availability of internet connectivity on teachers' integration of information communication technology in teaching and learning in public primary schools in Kenya. *International Journal of Research and Innovation in Social Science*, 7(11), 1473–1480. <https://doi.org/10.47772/IJRIS.2023.7011115>

Tella, A., & Obim, I. E. (2022). Teaching and learning online during COVID-19 lockdown, encouraging and discouraging?: The perspectives of students and staff of Library and Information Science in Nigerian universities. *Proceedings of the 50th Annual Conference of the International Association of School Librarianship and the 25th International Forum on Research on School Librarianship*, 1–16. <https://doi.org/10.29173/iasl8530>

Yamane, T. (1967). *Statistics: An introductory analysis* (2nd ed.). Harper & Row.