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Utilization of Wireless Communication Technology by Postgraduate Students and Research Scholars at Gulbarga University, Kalaburagi: A Study

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Abstract

This study investigates the utilization of wireless communication technology among postgraduate students and research scholars at Gulbarga University, Kalaburgi. This study is a descriptive survey method, the researcher has used simple random sampling techniques and collected data through an online questionnaire. Results indicated that the majority of respondents are daily users of wireless communication technology, with Wi-Fi and mobile data being the primary modes of access. Common academic activities facilitated by wireless communication include accessing online research journals, collaborating with peers, and submitting assignments online. Challenges identified encompass unreliable internet connection, limited bandwidth, and difficulties in accessing online resources among the library users at the university.

Keywords: Wireless communication technology, WIFI, Bluetooth, Mobile technology, and Gulbarga University Kalaburgi.

1. Introduction:

Wireless technology in libraries has seen a significant increase in interest and investment, as evidenced by the growing use of wireless Ethernet technology, particularly the 802.11 standards, to enhance library services and community engagement (Graham, 2002). This trend is driven by the proliferation of wireless-capable devices and the corresponding need for increased bandwidth, although it is often constrained by budget limitations and the complexity of competing technologies (Tomer, 2009). Wireless communication technology refers to the transmission of information and data without the use of physical wires or cables. It enables the exchange of data, voice, and multimedia content wirelessly between devices, providing flexibility, convenience, and mobility in

communication. Wireless communication technology utilizes various technologies and protocols, such as Wi-Fi, Bluetooth, mobile data (3G/4G/5G), and satellite communication. These technologies employ radio waves or infrared signals to transmit and receive data between devices, allowing seamless connectivity and communication. Wi-Fi, or Wireless Fidelity, is a popular wireless communication technology used for local area networking. It enables devices to connect to the internet and communicate with each other within a specific range. Wi-Fi networks are commonly found in homes, offices, educational institutions, and public spaces, providing wireless internet access for laptops, smartphones, and other devices.

Interestingly, while academic libraries focus on extending services and adapting to new instructional and service paradigms due to increased wireless networking, public libraries face economic and managerial challenges, such as insufficient bandwidth and the need to prioritize Internet services financially (Belsis et al., 2007). Security concerns also arise with the adoption of wireless technologies, as they are inherently insecure and vulnerable to information theft, necessitating the implementation of security protocols like WEP, WPA, and WPA2 to mitigate risks (Zaidan, 2021). The integration of wireless technology in libraries is multifaceted, involving the expansion of services, educational challenges, economic considerations, and security vulnerabilities. Libraries are adapting to these changes by deploying wireless networks to meet user demands while also addressing the associated challenges, including the need for secure and reliable access to the Internet.

- **Objectives of the study**

1. Evaluate the primary modes of wireless communication technology access among postgraduate students and research scholars at Gulbarga University.
2. Analyze the academic activities facilitated by wireless communication technology in the university setting.
3. Identify challenges in accessing online resources through wireless communication at Gulbarga University.
4. Examine the distribution of wireless communication technology usage across departments at Gulbarga University.
5. Propose recommendations to enhance internet connectivity and technical support for users of wireless communication technology at Gulbarga University.

2. Literature Review

The use of wireless technology in libraries, particularly Wi-Fi, has become integral to the student experience. As indicated in the literature, students increasingly rely on mobile devices for accessing information and require reliable and efficient wireless communication within library spaces (Guo & Xu, 2018). The LIB-INTRANET model, based on Wi-Fi technology, exemplifies how libraries are adapting to this need by providing content and services directly to handheld devices (Kalloli P., 2019). However, disparities exist in the adoption and utilization of such technologies, with some university libraries in Kenya and Nigeria still relying on conventional methods

and facing challenges such as inadequate funding and poor electricity infrastructure (Odero-Musakali & Mutula, 2007).

Interestingly, while students in some regions find Wi-Fi beneficial for their studies, enabling timely access to information and communication with peers and faculty (Kagiso et al., 2017), there is evidence of under-utilization and a need for increased awareness and interest in enhancing Wi-Fi usage (Wei, 2008). Moreover, the evolution of Wi-Fi technology has led to its widespread deployment and the exploration of new applications, further underscoring its importance in academic settings (Krishnamurthy & Pahlavan, 2020). Wireless technology, particularly Wi-Fi, is a critical component of modern library services that support student learning and research. While there is a clear trend towards the adoption of wireless technology in libraries, challenges remain in ensuring equitable access and maximizing its potential benefits. Efforts to improve Wi-Fi infrastructure and address barriers to adoption are necessary to meet the evolving needs of the students (Edem et al., 2005).

3. Methodology:

The methodology used in the study on the utilization of wireless communication technology by postgraduate students and research scholars at Gulbarga University, Kalaburagi involved a quantitative research approach. Here are the key points regarding the methodology:

Research Approach: The study employed a quantitative research approach to collect and analyze data on wireless communication technology utilization among the target population.

Data Collection Instrument: A questionnaire was designed to gather information on the types of wireless communication technologies used, frequency of usage, purposes, and perceived benefits and challenges.

Sampling Technique: The respondents, totaling 200 individuals, comprised 60 research scholars and 140 postgraduate students. The sample selection was done through a simple random sampling technique to ensure representation from both categories of respondents.

Data Analysis Tools: The collected data was analyzed using MS Excel and SPSS software to create tables and plot graphs for interpretation.

Data Interpretation and Analysis: The data collected from the questionnaire responses was analyzed and interpreted to draw logical conclusions regarding the utilization of wireless communication technology at Gulbarga University.

This methodology allowed the researchers to gather insights into the patterns of wireless technology usage, academic activities facilitated by wireless communication, challenges faced by users, and potential recommendations for enhancing internet connectivity and technical support for the university community.

4. Data interpretation and analysis.

Table 1 Distribution of Research Scholars and Postgraduate Students

Types of Respondents	Respondents	Percentage
Research Scholars	60	30%
Postgraduate Students	140	70%
Total	200	100%

Distribution of Research Scholars and Postgraduate Students

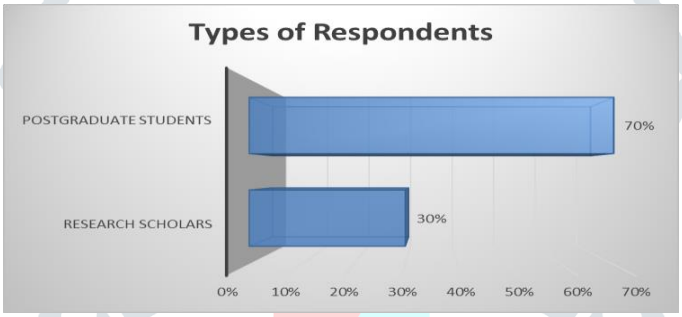

Table 1 shows that out of the total respondents, 30% were research scholars (60) and 70% were postgraduate students (140). Postgraduate Students represent the majority of respondents, comprising 70% of the total sample. Research Scholars, while fewer in number, still represent a significant portion, comprising 30% of the total sample.

Table 2-Gender Distribution

Gender	Respondents	Percentage
Male	110	55%
Female	90	45%
Total	**200**	**100%**

Figure 2-Genderwise Distribution

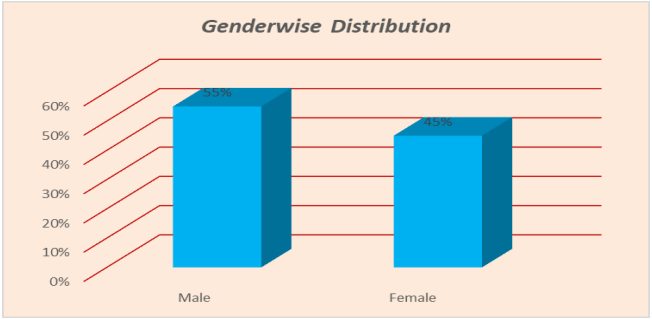

Table 2 indicates gender-wise distribution and it's depicted in Figure No.02, here, a slightly higher representation of male respondents (55%) compared to female respondents (45%) in the study. There's a higher

representation of males compared to females among the respondents, with males comprising 55% and females comprising 45% of the total sample. This indicates a higher proportion of male respondents.

Table 3. Age Distribution

Age	Respondents	Percentage
22-24	89	45.5%
25-34	109	54.5%
35 Above	11	5.%
Total	200	100%

Table 3 indicates that the majority of the respondents (54.5%) fell within the age range of 25-34. The age group of 22-24 constituted 45.5% of the respondents, while the age group of 35 and above constituted 5% of the respondents.

Table 4. Department/Program of Study Distribution

Department/Program of Study	Respondents	Percentage
Science	50	20%
Social sciences	80	40%
Commerce	60	30%
Humanities	10	05%
Languages	10	05%
Total	**200**	**100%**

Figure 4. Department/Program of Study Distribution

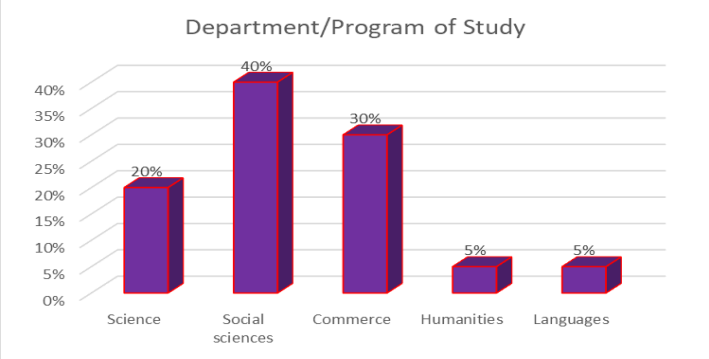

Table 4 indicates the department/program of study distribution shows that among the respondents, Social Sciences had the highest count (80, 40%), followed by Commerce (60, 30%), Science (50, 20%), and both Humanities and Languages had equal representation (10 each, 5% each).

5. Frequency of Wireless Communication Technology Usage

Frequency	Respondents	Percentage
Daily	120	60%
Several times a week	60	30%
Occasionally	15	7.5%
Rarely	5	2.5%
Never	00	00%
Total	**200**	**100%**

Figure-5

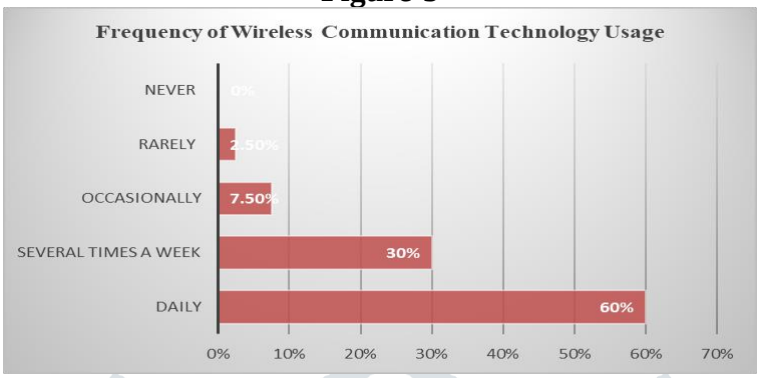

Table 5 shows the frequency of wireless communication technology usage among the respondents indicating that the majority (60%) reported using it daily, followed by 30% using it several times a week, 7.5% using it occasionally, and a smaller percentage (2.5%) using it rarely, while none reported never using it.

Table 6-Primary Wireless Communication Technologies

Technologies	**Respondents**	**Percentage**
Wi-Fi	89	44.5%
Mobile data (3G/4G/5G)	161	80.5%
Bluetooth	17	8.5%
Others	10	5%
Total	**277**	**138.5%.**

Table 6-Primary Wireless Communication Technologies

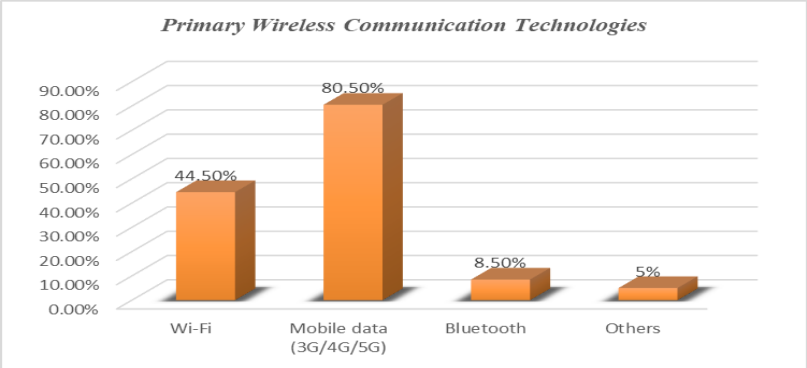

Table 6 indicates the primary wireless communication technologies utilized by the respondents were as follows: Wi-Fi was used by 89 individuals, representing 44.5% of the total; Mobile data (3G/4G/5G) was used by 161 individuals, accounting for 80.5%; Bluetooth was used by 17 individuals, constituting 8.5%; and others (specify) were used by 10 individuals, representing 5% of the respondents.

Table 7. Academic Activities Using Wireless Communication Technology.

Activities	Respondents	Percentage
Accessing online research journals and databases	170	85%
Collaborating with fellow students or scholars	150	75%
Participating in online courses or webinars	120	60%
Conducting literature reviews and accessing e-books	130	65%
Communicating with faculty members or supervisors	140	70%
Submitting assignments or research papers online	160	80%
Others	40	20%
Total	**910**	**435%.**

Figure 7. Academic Activities Using Wireless Communication Technology.

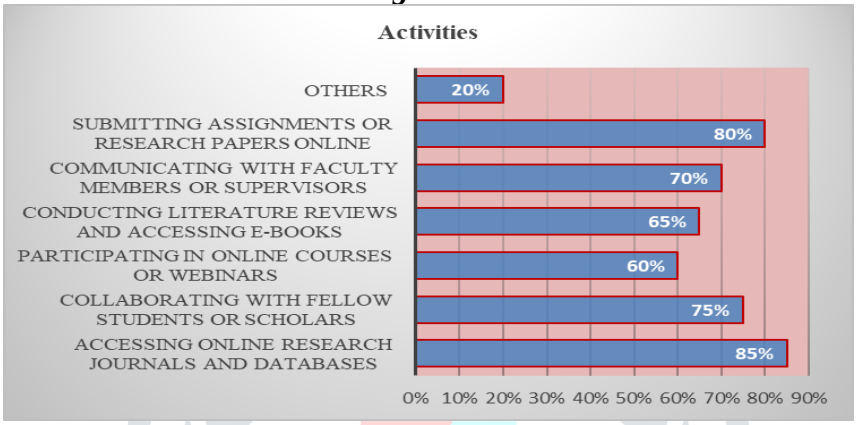

Table 7 indicates the academic activities that utilized wireless communication technology among the respondents included accessing online research journals and databases (85%), collaborating with fellow students or scholars (75%), participating in online courses or webinars (60%), conducting literature reviews and accessing e-books (65%), communicating with faculty members or supervisors (70%), submitting assignments or research papers online (80%), and other activities specified by 20% of the respondents.

Table 8. Average Hours of Wireless Communication Technology Usage

Average Hours	Respondents	Percentage
0-2 hours	60	30%
2-4 hours	90	45%
4-6 hours	40	20
6+ hours	10	5%
Total	**200**	**100%**

Figure 8. Average Hours of Wireless Communication Technology Usage

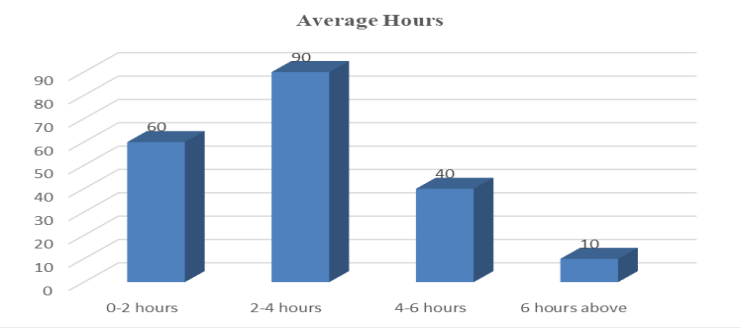

Table 8 indicates the average hours of wireless communication technology usage among the respondents varied, with 30% reporting using it for 0-2 hours, 45% for 2-4 hours, 20% for 4-6 hours, and a smaller percentage (5%) for 6+ hours.

Table 9. Challenges Faced while Utilizing Wireless Communication Technology

Challenges	Respondents	Percentage
Unreliable internet connections	80	40%
Limited bandwidth or slow internet speed	70	35%
Insufficient wireless coverage on campus	50	25%
Difficulty in accessing required online resources	100	50%
Technical issues with devices or software	60	30%
Lack of awareness or training	30	15%
Others	20	10%
Total	**410**	**205%**

Table 9. Challenges Faced while Utilizing Wireless Communication Technology

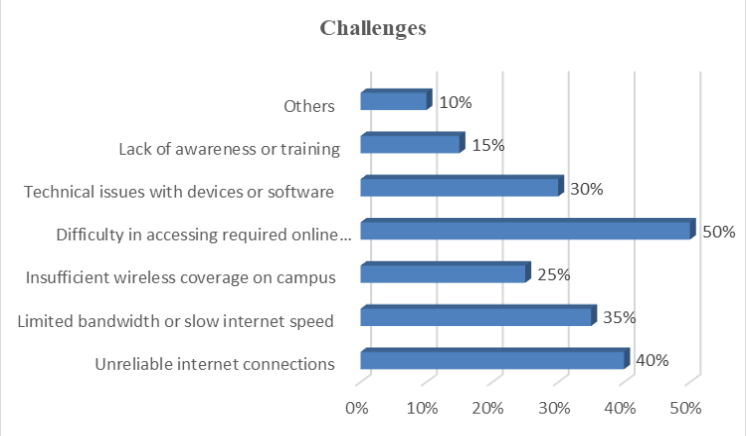

Table 9 shows the challenges faced by the respondents while utilizing wireless communication technology, with the most common challenges being difficulty in accessing required online resources (50%), followed by unreliable internet connection (40%), limited bandwidth or slow internet speed (35%), technical issues with devices or software (30%), insufficient wireless coverage on campus (25%), lack of awareness or training (15%), and other specified challenges (10%).

5. Findings and Suggestions

The major findings from the study on the utilization of wireless communication technology by postgraduate students and research scholars at Gulbarga University, Kalaburagi are as follows

- There was a slightly higher representation of male respondents (55%) compared to female respondents (45%).
- The majority of respondents fell within the age range of 25-34 (45%), followed by 18-24 (30%) and 35 and above (25%).
- The distribution across different departments/programs of study was as follows: Social sciences (40%), Commerce (30%), Science (20%), Humanities (5%), and Languages (5%).
- The primary wireless communication technologies used were Wi-Fi (44.5%), Mobile data (3G/4G/5G) (80.5%), Bluetooth (8.5%), and others (5%).
- Respondents reported utilizing wireless communication technology for various academic activities, with the highest usage reported for submitting assignments or research papers online (80%), followed by accessing online research journals and databases (85%) and communicating with faculty members or supervisors (70%).
- The most common challenges faced while utilizing wireless communication technology were difficulty in accessing required online resources (50%), unreliable internet connection (40%), and limited bandwidth or slow internet speed (35%).

These findings highlight the importance of wireless communication technology in academic settings and shed light on the challenges faced by postgraduate students and research scholars.

Suggestions:

- Improve internet connectivity and expand Wi-Fi coverage to ensure a stable and high-speed connection.
- Enhance accessibility to online resources such as research journals and databases.
- Provide technical support and training to address device and software issues.
- Increase awareness and digital literacy among students and scholars.
- Promote collaborative platforms for effective communication and collaboration.
- Establish a feedback mechanism to gather insights for continuous improvement.
- Monitor and upgrade wireless communication technology infrastructure regularly

6. Conclusion

this study sheds light on the utilization of wireless communication technology by postgraduate students and research scholars at Gulbarga University, Kalaburagi. The findings highlight the prevalence of daily technology usage, with Wi-Fi and mobile data as the primary communication tools. Wireless communication facilitates various academic activities, including accessing online resources, collaborating with peers, and submitting assignments online. However, challenges such as unreliable internet connectivity and limited access to required resources were identified. To overcome these issues, the study suggests improving internet infrastructure, enhancing resource accessibility, providing technical support, and promoting digital literacy. Furthermore, fostering collaborative platforms and implementing feedback mechanisms can enhance communication and problem-solving. Continuous monitoring and upgrading of technology infrastructure are essential to keep pace with evolving needs. Implementing these recommendations will lead to a more efficient and productive academic environment, benefitting the postgraduate students and research scholars at Gulbarga University.

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