Wi-Fi Technology Used by the Research Scholars of Mangalore University: A Study

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Abstract *- This paper discusses the uses of Wireless Fidelity (Wi-Fi) technology in higher education in the Mangalore University. It includes Wi-Fi standards, security, the adoption of the technology, challenges for implementation, Benefits for teachers and learners. This paper's main aim is the case study of status and importance of Wi-Fi technology for different disciplines' research works at Mangalore University. Although Wi-Fi technology has a great promise to research scholars in higher education; educational institutions and universities are still at the beginning stage of adoption. There is a vital need to make strategies to develop Wi-Fi technology support to improve the research, teaching and learning.*

Keywords: Wi-Fi, Wi-Fi Technology, Wireless Network, Higher Education

1. Introduction

Wi-Fi is the wireless networking technology that uses radio waves to provide high-speed internet and network connection. Wi-Fi network has no physical wired connection between sender and receiver. Wi-Fi is used for different purposes such as data transmission, wireless communication. Wi-Fi connection ensures faster, more reliable internet access and it is cheaper. This network allows any connection without using cards, we can take our laptops wherever we want with the option of having a wireless connection with the help of routers and adapters**.**

2. Earlier Studies

Selvaraja et.al., (2014) The researchers have made an attempt to find out the awareness and use of Wi-Fi service by the research scholars of University of Mysore for different research purposes. For the collection of data the investigators prepared a structured questionnaire and distributed to the research community of the University. In a total, 150 questionnaires were distributed to research scholars of 35 different departments, out of which, 114 filled questionnaires were received back from 27 departments with 76 percent response rate. The authors finally suggested that by increasing speed of Internet and creating awareness about use and terms and conditions of Wi-Fi service, one can help researchers to utilize the service

up to a maximum extent. **Krishnamurthy and Rajashekara (2011)** study examines the wireless operations permit services, such as long-range communications that are impossible or impractical to implement using wires. Wireless communication brings fundamental changes to data networking and electronic communications, and makes integrated networks a reality. Wireless networks focus on networking and user aspects. Network architecture for personal communication systems, wireless LANs, radio, tactical and other wireless networks, and design and analysis of protocols are addressed on a regular basis. At present, the major application of Wi-Fi implementation in libraries is limited to information management. This paper elaborates the Wi-Fi in detail about the components, functions, area of applications, issues, and challenges.

Singson (2011) The new technology that is making an inroad to the teaching and research domain can be a boon to the teaching learning community. Wi-Fi for instance has a tremendous contribution in the way students connect and access information. This paper looks into the level of Wi-Fi awareness and the problems faced by the student community in the campus and their level of competence. The study involved a questionnaire survey of students residing in the campus. The parameter for the research was ICT literacy, Wi-Fi awareness, connectivity problem, usage, gadget preference. The outcome of the finding suggest that although the calls for radical transformation in educational approaches may be legitimate it would be misleading to ground the arguments for such change solely in students' opinion and that the infrastructure indeed shows a great deal of benefit to the student in the way they connect online. The finding also identified the problems in WiFi hotspots and coverage.

3. Need for the Study

Within the campus, 200 Wi-Fi Access Points (AP) have been established and few open AP connections are also available in all discipline buildings. For a security point of view, the access is based on Wireless MAC address with login and password. The focus of the present study is the use of Wi-Fi and its impact on the users (research scholars). The researchers observed that there is lack of awareness in not using advanced technology. Hence, the main aim of this paper is to cover the various aspects of the Wi-Fi- based information needs of the research scholars of the Humanities/Social Sciences, Science/Technology, and Commerce/Management disciplines in the Mangalore University Campus taking in to consideration the changing ICT environment.

4. Objectives

The specific objectives of the research are:

- To find preferred places to access Wi-Fi facility by the research scholars of Mangalore University
- To trace the satisfaction level of usage of the Wi-Fi service by the research scholars of Mangalore University
- To know the frequency of usage of the Wi-Fi facility in the Mangalore University campus
- To find the purpose of the usage and its advantages in accessing Wi-Fi services
- To find the problems faced by the research scholars in using the Wi-Fi facility

5. Methodology

The data was collected based on the questionnaire. The aim of the questionnaire was to examine the extent of Wi-Fi technology usage among the target group of all disciplines of research scholars of Mangalore University. 250 printed questionnaires were administered to all the users of the 30 departments of the selected disciplines within the campus. The survey comprised of closed-ended questions organized in three sections.

Table 1: Distribution of Questionnaires and Response Pattern

Sl. No.	Disciplines	Questionnaires Distributed	Responses Received	Percentage
1	Science/Technology	90	79	87.78
2	Humanities/Social Science	55	46	83.64
3	Commerce/Management	65	56	86.15
	Total	250	181	100.00

Table 1 reveals that majority, (87.78%) of the respondent users were from the Science /Technology discipline, followed by 83.64% from Humanities/Social Science, and 86.15% from Commerce/Management.

6. Data Interpretation and Analysis

The survey for this study was designed with the primary goal of better understanding the factors that motivates research scholars to access the Wi-Fi network in the university. It was also hoped that the survey responses would illuminate and highlight the problems associated in accessing the wireless network in the university at a broader level. Specifically, the questionnaire explores whether the research scholars are aware of the existence of the Wi-Fi network and to make an in-depth study of the behaviours and purpose of the residential research scholars in using the Wi-Fi network. The study was primarily targeted at the research scholars residing within the campus and have access to the network.

Table 2: Discipline- wise questionnaires distribution

Sl. No.	Discipline	No. of Respondents	Percentage
1	Science / Technology	79	43.60
2	Humanities/Social Science	46	25.40
3	Commerce / Management	56	30.90
	Total	181	100.00

The above table shows that, Science / Technology has the highest percentage of users, i.e., 79(43.60%), followed by 46(25.40%) from Humanities/Social Science, and 56(30.90%) ~~from~~ Commerce / Management.

Table 3: Residential- wise questionnaires distribution

Residential Area	No. of Respondents	Percentage
Urban	97	53.60
Rural	84	46.40
Total	181	100.00

Table 3 shows that 97(53.60%) users are from urban areas and 84(46.40%) are from rural areas.

Table 4: Gender- wise Questionnaire Distribution

Gender	No. of Respondents	Percentage
Male	101	55.80
Female	80	44.20
Total	181	100.00

Table 4 signifies the variation of responses by gender. Of the 181 survey respondents, 101(55.80%) are male and 80(44.20%) are female.

Table 5: Awareness about Wi-Fi Technology

Aware of Wi-Fi	No. of Respondents	Percentage
Yes	181	100.00
No	0	0.00
Total	181	100.00

Table 5 shows that 181(100.00%) researchers are aware of the Wi-Fi technology.

Table 6: Frequency of Wi-Fi Usage

Sl. No.	Duration	No. of Respondents	Percentage
1	Daily	86	47.50
2	2-3 times a week	38	21.00
3	Once in a week	25	13.80
4	Once in a month	20	11.00
5	Occasionally	12	6.60
	Total	181	100.00

According to Table 6, 86(47.50%) respondents use the network on a daily basis, 38 (21.00%) and 25 (13.80%) use it 2-3 times in a week and once in a week, respectively, and (21.00%) and 25 (13.80%) use it once in a month and occasionally, respectively.

Table - 7: Device Used

Sl. No.	Devices	Yes	No	Total
1	Laptop	113 (62.40%)	68 (37.60%)	181 (100.00%)
2	Smartphone	112 (61.90%)	69 (38.90%)	181 (100.00%)
3	Mobile Phone	78 (43.10%)	103 (56.90%)	181 (100.00%)
4	Tablet	111 (61.30%)	70 (38.70%)	181 (100.00%)
5	iPhone	56 (30.90%)	125 (69.10%)	181 (100.00%)
6	Other	65 (35.90%)	116 (64.10%)	181 (100.00%)

Table 7 shows that 113 (62.40%) are using laptops, 112 (61.90%) Smartphones, 78 (43.10%) mobile phones, 111 (61.30%) tablets, 56 (30.90%) iPhones, and 65(35.90%) are using other devices to access the Wi-Fi network.

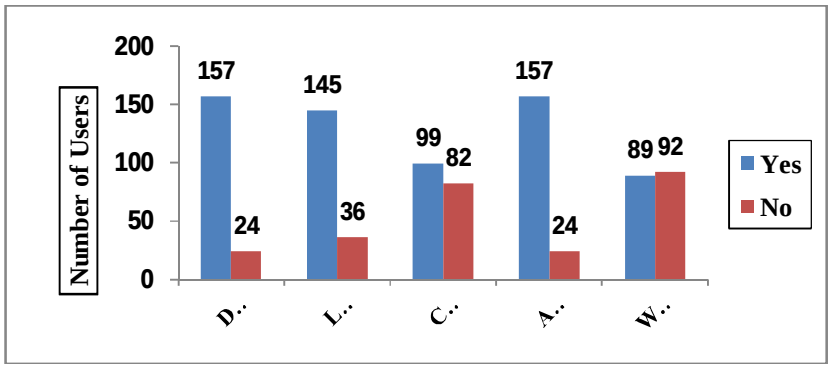

Figure 1: Wi-Fi Access Points

The above table depicts the places where the users are accessing the Wi-Fi technology. About 157 (86.70%) each of the users access it from the department and from anywhere in the campus, 145 (80.10%) from the library, 99 (54.70%) from a cyber lab, 89 (49.20%) favour their workplace, and114 (63.00%) from their hostel.

Table 8: Advantages of Wi-Fi Services

Sl. No.	Advantages	Yes	No	Total
1	Speed of network	137 (75.70%)	44 (24.30%)	181 (100.00%)
2	Low cost of usage	123 (68.0%)	58 (32.00%)	181 (100.00%)
3	Unlimited data usage	124 (68.50%)	57 (31.50%)	181 (100.00%)
4	High level of security	136 (75.10%)	45 (24.0%)	181 (100.00%)
5	Network coverage	102 (56.40%)	79 (43.60%)	181 (100.00%)
6	Automated login	101 (55.80%)	80 (44.20%)	181 (100.00%)
7	Simple manual login	133 (73.50%)	48 (26.50%)	181 (100.00%)
8	Access to unique content	101 (55.80%)	80 (44.20%)	181 (100.00%)
9	Advice choice to select network	124 (68.50%)	57 (31.50%)	181 (100.00%)
10	National & International roaming	91 (50.30%)	90 (49.70%)	181 (100.00%)
11	None of the above	101 (55.80%)	101 (55.80%)	181 (100.00%)

The above table indicates that, speed of internet connection is the main advantage as agreed to by 137 (75.70%) respondents, 123 (68.0%) pointed to the low cost of usage, 124 (68.50%) each mentioned advantages like unlimited data usage and advice choice to select network, 136 (75.10%) agreed to the high level of security 102 (56.40%) to network coverage, 101 (55.80%) each to advantages like automated login and access to unique content, and 91 (50.30%) replied that, it allowed mobile users with laptop to move from one access point to another.

Table 9: Purpose of Wi-Fi Usage

Sl. No.	Purpose	Yes	NO	Total
1.	To search information related to subjects	137 (75.70%)	44 (24.30%)	181 (100.00%)
2.	To discuss with teachers and friends	90 (49.70%)	91 (50.30%)	181 (100.00%)
3.	To search tutorials and PowerPoint presentations	102 (56.40%)	79 (43.60%)	181 (100.00%)
4.	To search e-reference sources (like, online dictionaries, etc.)	136 (75.10%)	45 (24.90%)	181 (100.00%)
5.	To search e-books and e-journals	125 (69.10%)	56 (30.90%)	181 (100.00%)
6.	To search e-theses and dissertations	147 (81.20%)	34 (18.80%)	181 (100.00%)
7.	To search for job related information	123 (68.00%)	58 (32.00%)	181 (100.00%)
8.	For entertainment	102 (56.40%)	79 (43.60%)	181 (100.00%)
9.	To use social network sites (like Facebook, LinkedIn, etc).	114 (63.00%)	67 (37.00%)	181 (100.00%)

The study reveals that 137 (75.70%) respondents use the Wi-Fi services to search for information related to subjects, and 125 (69.10%) said that it is possible to search e-books and e-journals. The main purpose of using the Wi-Fi services was to search e-reference sources (like online dictionaries), e-theses and dissertations, job related information, entertainment and to use social network sites by 136 (75.10%), 147 (81.20%), 123 (68.00%), 102 (56.40%), and 114 (63.00%) of the users, respectively.

Table 10: Type of Connection

Sl. No.	Broadband	No. of Respondents	Percentage
1	Extremely important	82	45.30
2	Very important	77	42.50
3	Moderately important	12	6.60
4	Slightly important	10	5.50
5	Not important	0	0.00
	Total	181	100.00

The role of Wi-Fi in connected broadband is considered extremely important by 82(45.30%) respondents, very important by 77(42.50%) respondents, moderately important by 12 (6.60%) respondents, and only 10 (5.50%) respondents opined it as slightly important.

Table 11: Preferred Network Access

Sl. No.	Attributes	Mobile/Cellular	Wi-Fi	No Difference	Total
1.	Lowest cost	68 (37.60%)	101 (55.80%)	12 (6.60%)	181 (100.00%)
2.	Speed of network	22 (12.20%)	125 (69.10%)	34 (18.80%)	181 (100.00%)
3.	Best reliability	0 (0.00%)	147 (81.20%)	34 (18.80%)	181 (100.00%)
4.	Best performance for my applications	0 (0.00%)	113 (62.40%)	68 (37.60%)	181 (100.00%)

5.	Best coverage	45 (24.90%)	92 (50.80%)	44 (24.30%)	181 (100.00%)
6.	Most secure	34 (18.80%)	91 (50.30%)	56 (30.90%)	181 (100.00%)
7.	Easier to use	43 (23.80%)	104 (57.50%)	34 (18.80%)	181 (100.00%)

The two major categories of internet access are Mobile /Cellular and Wi-Fi networks. As per the table, 101 (55.80%) of respondents assume that the Wi-Fi network access costs less compared to mobile/ cellular, 104 (57.50%) consider Wi-Fi easier to use than mobile, and 147 (81.20%) users think that Wi-Fi is more reliable, 92 (50.80%) respondents preferred Wi-Fi network, 44 (24.30%) remarked that there is no difference between the two networks, and 113 (62.40%) felt that Wi-Fi network gives the best performance for all applications.

Table 12: Status of Wi-Fi Speed

Sl. No.	Wi-Fi Connection Speed	No. of Respondents	Percentage
1	Excellent	68	37.60
2	Very Good	24	13.30
3	Good	89	49.2
4	Poor	0	.00
5	Very poor	0	.00
	Total	181	100.00

From the above table, it was found that out of 181 respondents, 68(37.60%) respondents felt that the Wi-Fi connection speed is excellent, about 24(13.30%) felt very good, whereas maximum felt that the speed is good.

Table 13: Problems Faced by Users While Using Wi-Fi Connection

Sl. No.	Problems	Yes	No	Total
1.	Slow	67 (37.00%)	114 (63.00%)	181 (100.00%)
2.	Frequently disconnects	79 (43.60%)	102 (56.40%)	181 (100.00%)
3.	Difficulty in roaming	55 (30.40%)	126 (69.60%)	181 (100.00%)
4.	Logon problems	145 (80.10%)	36 (19.90%)	181 (100.00%)
5.	Proxy	111 (61.30%)	70 (38.70%)	181 (100.00%)
6.	Less renewal period	133 (73.50%)	48 (26.50%)	181 (100.00%)
7.	Site restriction	123 (68.00%)	58 (32.00%)	181 (100.00%)
8.	One system for one user	113 (62.40%)	68 (62.40%)	181 (100.00%)
9.	Lack of internet access speed	91 (50.30%)	90 (49.70%)	181 (100.00%)
10.	Limited connectivity	89 (49.20%)	92 (50.80%)	181 (100.00%)

Many users face problems while using the Wi-Fi. These factors were discussed in the above table. About 67 (37.00%) users faced problems of lowest connection speed, 79 (43.60%) found that when the speed is lower than normal it disconnects the network, 145 (80.10%) faced logon problems because to get Wi-Fi activated, the user had to logon each time in a particular hotspot, 123 (68.00%) were fed up with the *restricted* or blocked *websites* on the *Wi-Fi* network, and 89(49.20%) said that limited *connectivity* error is the main problem while using the Wi-Fi connection.

Table 14: Level of Satisfaction with Present Wi-Fi Connection

Sl. No.	Users Satisfied	No. of Respondents	Percentage
1	Fully satisfied	22	12.20
2	Satisfied	67	37.00
3	Partially Satisfied	75	41.40
4	Satisfied to a little extent	12	6.60
5	Not Satisfied	5	2.80
	Total	181	100.00

The above table shows the various levels of satisfaction with the present Wi-Fi connection. About 22 (12.20%) users are fully satisfied with the Wi-Fi facility, 67 (37.00%) are satisfied, 75 (41.40%) are partially satisfied, 12 (6.60%) are satisfied to a little extent, and 5 (2.80%) users are not satisfied with the Wi-Fi connection.

8. Conclusion

The Wi-Fi facility enabled research scholars can access Wi-Fi in classrooms, research laboratory, library, hostel rooms and campus, 24 X 7 free of cost. Moreover, the Wi-Fi enabled campus would help in providing free and affordable high quality e-content to all the students and research scholars of the Mangalore University. The University should encourage these ideas for the improvement of quality based research in the country.

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