

Utilization of ICT Resources in the Medical Colleges in Puducherry

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Abstract

The study examined the utilization of ICT resources for study and research by the students and faculty members of medical colleges in Puducherry. Three medical colleges viz. JIPMER, Mahatma Gandhi and Manakular Medical Colleges were selected for the study. It is found that more than half of the students and faculty members have internet connection facilities in their home. It is also observed that majority of the respondents highly use www, e-mail and voicemail towards their research purpose.

Keywords: Information Communication Technology, Medical Colleges, Utilization of Resources

1. INTRODUCTION

Advances in telecommunication technology in the last two decades have led to the development of computer networks that allow access to vast amount of information and services. Of the many computer networks that have been developed, the most prominent and widespread is the Internet, a global network of networks that enables computers of all kinds to directly and transparently communicate throughout the world [1].

As in many other fields, the Internet is also present in medical domain. The Development of the Internet, as a vehicle for World-wide communication, and the emergence of the World Wide Web, has made instantaneous access to much of the entire body of medical information an exciting one. It is now one of the most important sources of information for students in institutions of higher learning throughout the world. It has also become a popular medium for delivering educational materials [2]. The Internet has been used for medical education in diverse ways including teaching of organs, diagnosis of diseases, and conduct of medical examinations. It is also being used as an important source of information for medical research [3]. Medical and nursing students who have participated in online education have stated that this mode of education has several advantages over traditional method of instruction. These advantages include the convenience

of taking a course at a time that fitted students schedule and at a place that they did not have to commute to attend. Online learning also assists students with the practical application of theoretical knowledge of some aspects of medicine such as cardiology.

Key application domains for ICT in healthcare delivery include telemedicine, telehealth (or e-health) and home telecare. Telemedicine typically defined as “a system of healthcare delivery in which physicians examine patients through the use of telecommunications technology”. It may encompass telepsychiatry, teleradiology, telepathology, teledermatology and teleophthalmology [4]. However, its primary function is providing specialist consultation to distant communities, rather than to provide a tool for self-management of chronic disease. In contrast, telehealth incorporates a broad range of health-related activities, including patient and provider education, and health services administration, as well as patient care. The development of e-health initiative designed to provide patients with rapid access to general health information, reduce duplication of services, provide greater portability of health records and enhance the quality of information exchange between providers [5].

Clinical decision support is another important area of application of ICT. It is heavily dependent on ready

access to medical knowledge databases, as well as sophisticated search engines, which automatically adapt and learn from the user's search history. The Clinical Information Access Program (CIAP), which provides information resources to support evidence-based practice at the point of care, is an excellent example of such a service [6].

Since the development of the computer and the evolution of the internet, information technology (IT) has had a positive impact on health care delivery systems worldwide, particularly in the area of disease control diagnosis, patient management and teaching. While the use CD-ROM and interactive software packages have greatly contributed to dissemination of information amount health care professionals, its use is still very limited in developing countries like India. The computer and IT offer the physician the ability to store and retrieve patient clinical and socio demographic information, laboratory results and preparation of referral notes. It also aids the preparation of discharge summaries, clinic letters and financial statements of the hospital, as well as delivery of laboratory results [7].

The Internet provides opportunities to retrieve up-to-date information on different aspects of diseases, interact with colleagues via videoconferencing, and enhance communication amongst colleagues in different continents. Free access to Medline, medical journals, textbooks and the latest information on breakthroughs in medicine also encourages learning and research [8].

An information-proficient workforce that is computer literate, trained in information management skills and motivated to use the well-designed clinical systems would be necessary in at tertiary institution particularly in a developing country such as in the Clinical informatics aims to improve patient care by the intelligent application of technology and hopes to increase the effectiveness and efficiency of care, as well as patient safety.

2. SCOPE OF THE STUDY

This study attempts to examine the impact of internet resources towards acquisition of knowledge among the students and faculty members of Medical Colleges in Pondicherry region. The researcher has selected three medical colleges in Pondicherry viz Mahatma Gandhi Medical College, JIPMER Medical college and Manakula Vinayagar Medical College. In total, 474 students and faculty members are selected as sample. The researcher has employed a well structured questionnaire for collecting data from the respondents. The collected data are classified and tabulated according to the objectives and hypotheses stated. First, the data are recorded on data sheets and then fed in the computer personally.

3. RESULTS AND DISCUSSION

Table 1 Institution-wise Respondents' Internet Connection Facilities

Institution	Home		Total
	Yes	No	
Mahatma Medical College	85 (64.88)	46 (35.11)	131
Jipmer Medical College	189 (64.28)	105 (35.71)	294
Manakula Vinayagar Medical College	32 (65.31)	17 (34.69)	49
Total	306 (64.56)	168 (35.44)	474

Source: Computed Figures in parentheses denote percentages

Chi-square Summary Result

Chi square Calculated Value	2.765E-02
Degrees of Freedom	2
Chi square table value 5%	5.99

Table 1 indicates the Institution-wise respondents' internet connection facilities. In this study all respondents have internet connection facilities in their office. Out of the total 474 respondents 64.56% of them have internet facilities in their home and the rest 35.44% of them have no internet facilities in their home. Majority of the respondents of all institutions have internet facilities in their home.

The chi square test is applied for further discussion. The computed chi-square value is 00.2, which is lesser than its tabulated value at 5% level significance. Hence the, difference in institutional status is statistically identified as insignificant with respect to respondents' internet facilities in their home.

A study of data in Table 2 indicates the Institution-wise respondents' duration of internet use per day. It

could be noted that out of the total 474 respondents 5.27% of them use less than 1 hour internet per day, 12.61% of them use internet 1-2 hours per day and 22.99% of them use internet 2-4 hours per day. In this study 13.17% of them use internet 4-6 hours per day, 13.08% of them use internet 6-8 hours per day, 7.81% of them use internet 8-10 hours per day and 7.81 % of them use internet more than 10 hours per day.

Table 2 Institution-wise Respondents' Duration Internet per Day

Institution	Less than One Hour	1 to 2 Hours	2 to 4 Hours	4-6 Hours	6-8 Hours	8-10 Hours	More than Ten Hours	Total
Mahatma Medical College	4 (3.5)	18 (13.74)	42 (32.06)	32 (24.43)	15 (11.45)	13 (9.92)	8 (6.11)	131
Jipmer Medical College	19 (6.46)	41 (13.94)	50 (17.1)	102 (34.69)	34 (11.56)	21 (7.14)	27 (9.18)	294
Manakula Vinayagar Medical College	2 (4.08)	2 (4.08)	17 (34.69)	9 (18.36)	13 (26.53)	3 (6.12)	3 (6.12)	49
Total	25 (5.27)	61 (12.67)	109 (22.99)	143 (30.17)	62 (13.08)	37 (7.81)	37 (7.81)	474

Source: Computed Figures in parentheses denote percentages

Chi-square Summary Result

Chi square Calculated Value	33.86
Degrees of Freedom	12
Chi square table value 5%	21

The Institution-wise analysis reveals the following facts. Majority of the Mahatma Gandhi Medical College respondents use internet 2-4 hours per day (32.06%) and JIPMER Medical College mainly use internet 4-6 hours per day (34.69%). In general, Manakula Vinayagar

Medical College constitutes more number with respect to more users of internet 7-8 hours per day than those of others.

The chi-square test is applied for further discussion. The computed chi-square value is 33.86, which is greater than its tabulated value at 5% level significance. Hence the, difference in institution status is statistically identified as significant with respect to respondents' duration of internet use per day.

Table 3 Institution-wise Respondents Computer Software Use Behaviour

Institution	Software Uses	Software Non-Uses	Level of Performance				Total	Grand Total
			Excellent	Good	Satisfactory	Poor		
Mahatma Medical College	117 (89.31)	14 (10.61)	15 (12.82)	35 (29.91)	58 (49.57)	9 (7.69)	117 (89.31)	131
Jipmer Medical College	275 (93.53)	19 (6.47)	63 (22.09)	104 (37.81)	89 (32.36)	19 (6.09)	275 (93.53)	294
Manakula Vinayagar Medical College	46 (93.8)	3 (6.20)	3 (6.52)	17 (36.95)	25 (54.35)	1 (3.32)	46 (93.8)	49
Total	438 (92.4)	36 (7.59)	81 (18.49)	156 (35.61)	172 (39.26)	29 (6.62)	438 (92.4)	474

Source: Computed Figures in parentheses denote percentages

Chi-square Summary Result

Chi-square Calculated Value	20.74
Degrees of Freedom	6
Chi-square table value 5%	12.6

A study of data in Table 3 indicates the respondents' computer software use behaviour. It could be noted that out of the total 474 respondents 92.4% of them have experience on software usage and the rest 7.59% of them have no such experience. An analysis of respondents of them state that software usage is excellent, 35.61% of them refer it as good, 39.26% of them have satisfactory views software use are and the rest 6.62% of them regard it as poor.

The institution wise analysis reveals the following facts. Though most of the respondents of all institutions have library software use practice, the respondents of Mahatma Gandhi Medical College lag behind others. Majority of the respondents of Mahatma Gandhi Medical College (49.57%) and Manakula Vinayagar Medical College (54.35%) have satisfactory views on performance of library software. However, a considerable number of respondents of Jipmer Medical College have good opinion on performance of library software (37.81%).

The chi square test is applied for further discussion. The computed chi-square value is 20.74, which is greater than its tabulated value at 5% level significance. Hence the, difference in institution status is statistically identified as significant with respect to respondents' views on performance of library software.

A study of data in table 4 indicates the institution wise respondents' extent of utilization of internet resource on research purpose. It could be noted that out of the total 474 respondents 50.42% of them highly.

The respondents use websites for their research purpose, 33.97% of them frequently use it for their research purpose, 7.80% occasionally use them for their research purpose and the rest 7.80% of them rarely use it for their research purpose. It is observed that out of the total 474 respondents 36.1% of them highly use e-mail for their research purpose, 37.35% of them frequently

use e-mail for their research purpose, 15.82% of them occasionally use e-mail for their research purpose and the rest 10.55% of them rarely use e-mail for their research purpose.

It is significant to note that out of the total 474 respondents 41.98% of them highly use Voice mail for their research purpose, 36.1% of them frequently use Voicemail for their research purpose, 13.50% of them occasionally use voicemail for their research purpose and the rest 8.44% of them rarely use voicemail for their research purpose. In this study that out of the total 474 respondents 24.26% of them highly use CDROM services for their research purpose, 28.27% of them frequently use CDROM services for their research purpose, 27.85% of them Occasionally use CDROM services for their research purpose and the rest 19.62% of them rarely use CDROM services for their research purpose.

It is seen from the table that out of the total 474 respondents 21.1% of them highly use printer for their research purpose, 50% of them frequently use printer for their research purpose, 20.04% of them Occasionally use printer for their research purpose and the rest 8.86% of them rarely use printer for their research purpose. In this study that out of the total 474 respondents 8.65% of them rarely use fax for their research purpose.

It is observed from the table that out of the total 474 respondents 5.91% of them highly use DVD for their research purpose, 10.13% of them frequently use DVD for their research purpose, 29.79% of them occasionally use DVD for their research purpose and the rest 54.22% of them rarely use DVD for their research purpose. It is learnt from the table that out of the total 474 respondents 8.65% of them highly use subject specific software for their research purpose, 13.29% of them frequently use subject specific software for their research purpose, 31.22% of them occasionally use subject specific software for their research purpose and the rest 46.81% of them rarely use subject specific software for their research purpose.

Table 4 Institution-wise Respondents Utilization of Internet Resource for Research Activities

Institution	www				E-Mail				
	Highly	Frequently	Occasionally	Rarely	Highly	Frequently	Occasionally	Rarely	
Mahatma Medical College	73 (55.73)	43 (32.82)	9 (6.87)	6 (4.58)	49 (37.4)	65 (49.62)	9 (6.87)	8 (6.11)	
Jipmer Medical College	147 (50)	104 (35.37)	20 (6.80)	23 (7.82)	117 (39.79)	104 (35.37)	54 (18.37)	19 (6.46)	
Manakula Vinayagar Medical College	19 (38.77)	14 (28.57)	8 (16.33)	8 (16.33)	5 (10.20)	9 (18.37)	12 (24.49)	23 (46.94)	
Total	239 (50.42)	161 (33.97)	37 (7.80)	37 (7.80)	171 (36.1)	178 (37.55)	75 (15.82)	50 (10.55)	
Institution	Voicemail				CDROM				
	Highly	Frequently	Occasionally	Rarely	Highly	Frequently	Occasionally	Rarely	
Mahatma Medical College	73 (55.73)	26 (19.85)	26 (19.85)	6 (4.58)	18 (13.74)	25 (19.1)	34 (25.95)	54 (41.22)	
Jipmer Medical College	106 (36.05)	126 (42.86)	31 (10.54)	31 (10.54)	88 (29.93)	96 (32.65)	79 (26.87)	31 (10.54)	
Manakula Vinayagar Medical College	20 (40.82)	19 (38.77)	7 (14.28)	3 (6.12)	9 (18.37)	13 (26.53)	19 (38.77)	8 (16.33)	
Total	199 (41.98)	171 (36.1)	64 (13.5)	40 (8.44)	115 (24..26)	134 (28.27)	132 (27.85)	93 (19.62)	
Institution	Printer				Fax				
	Highly	Frequently	Occasionally	Rarely	Highly	Frequently	Occasionally	Rarely	
Mahatma Medical College	31 (23.66)	77 (58.78)	9 (6.87)	15 (11.45)	6 (4.58)	13 (9.92)	23 (17.56)	89 (67.94)	
Jipmer Medical College	50 (17.01)	146 (49.66)	79 (26.87)	19 (6.46)	33 (11.22)	27 (9.18)	40 (13.60)	194 (65.99)	
Manakula Vinayagar Medical College	19 (38.77)	14 (28.28)	7 (14.28)	9 (18.37)	2 (4.08)	5 (10.20)	19 (38.77)	23 (46.94)	
Total	100 (21.1)	237 (50)	95 (20.04)	42 (8.86)	41 (8.65)	45 (9.49)	82 (17.29)	306 (64.56)	
Institution	DVD				Subject Specific software				Total
	Highly	Frequently	Occasionally	Rarely	Highly	Frequently	Occasionally	Rarely	
Mahatma Medical College	4 (3.1)	12 (9.16)	98 (7.81)	17 (12.97)	10 (7.63)	10 (7.63)	85 (64.88)	26 (19.85)	131
Jipmer Medical College	13 (4.42)	19 (6.46)	34 (11.56)	228 (77.55)	27 (9.18)	49 (16.67)	44 (14.96)	174 (59.18)	294
Manakula Vinayagar Medical College	11 (22.45)	17 (34.69)	9 (18.37)	12 (24.49)	4 (8.16)	4 (8.16)	19 (38.77)	22 (44.89)	49
Total	28 (5.91)	48 (10.13)	141 (29.75)	259 (54.22)	41 (8.65)	63 (13.29)	148 (31.22)	222 (46.83)	474

Source: Computed Figures in parentheses denote percentages

ANOVA						
Source of Variation	SS	Df	MS	F	P-value	F crit
Rows	15549.08	2	7774.542	13.65737	0.000513	3.73889
Columns	14763.17	7	2109.024	3.704878	0.017725	2.764196
Error	7969.583	14	569.256			
Total	38251.83	23				

The institution wise analysis reveals the following facts. Majority of the respondents of Mahatma Medical College highly use WWW (55.76%) and Voicemail (55.73%) towards research purpose. A considerable number of respondents of JIPMER Medical College frequently use Voicemail (42.86%), subject specific software (32.65%) and printer (49.66%). Majority of the Manakula Vinayagar Medical College respondents rarely use e-mail (46.94) for their research purpose.

The anova two-way model is applied for further

discussion. At one point the computed ANOVA value 31.65 which is greater than its tabulated value at 5% level of significant. Hence, variation with respect to high level utilization of various ICT devices towards respondents' research purpose is statistically identified as significant. In another point the computed anova value 3.70 which is greater than its tabulated value at 5% level of significant. Hence, variation among the chosen institutions is statistically identified as significant with respect to respondents' extent of utilization of various ICT devices.

Table 5 Institution-wise Respondents' Satisfaction on Internet Resource Facilities in their Libraries

Institution	Highly Satisfied	Partially Satisfied	Normally Satisfied	Unsatisfied	Total
Mahatma Medical College	45 (34.35)	28 (21.37)	37 (28.24)	21 (16.03)	131
Jipmer Medical College	79 (26.87)	73 (24.83)	106 (36.05)	36 (12.24)	294
Manakula Vinayagar Medical College	5 (10.2)	21 (42.86)	17 (34.69)	6 (12.24)	49
Total	129 (27.22)	122 (25.74)	160 (33.75)	63 (13.29)	474

Source: Computed Figures in parentheses denote percentages

Chi-square Summary Result

Chi square Calculated Value	16.99
Degrees of Freedom	6
Chi square table value 5%	12.6

Data presented in Table 5 indicate the institution-wise respondent's satisfaction on internet resource facilities in the libraries. It is observed that out of the total 474 respondents 27.22% of them are highly satisfied with internet resource facilities available in their institutions and 24.75% of them are partially satisfied. In this study, out of the total 474 respondents 33.75% of them are normally satisfied with internet resource facilities available in their institutions and the rest 13.29% of them are dissatisfied with internet resource facilities available in their institutions. Majority of the respondents of Manakula Vinayagar Medical College (42.86%) are partially satisfied with internet resource facilities available in their institutions.

The chi square test is applied for further discussion. The computed chi square value is 16.99, which is greater

than its tabulated value at 5% level significance, Hence the, difference in institution status is statistically identified as significant with respect to respondents' satisfaction on internet resource facilities available in their institutions.

4. CONCLUSION

It is observed that a more than half of the students and faculty members have internet connection facilities in their home, 4-6 hours duration of internet use occupies the first position, 2-4 hours the second, 6-8 hours the third, 1-2 hours the fourth and below 1 hours duration the last. The respondents have software use practice. The rate is mainly satisfactory and good level performance of library software. It is also seen that majority of the respondents highly use WWW, e-mail and voicemail

towards their research purpose. All the respondents frequently use printer towards their research purpose. However majority of the respondents rarely use fax, DVD and subject specific software towards their research purpose. The respondents rate first order priority to normal satisfaction with internet resource facilities available in their institution, high level of satisfaction internet resource facilities available in their institutions the second, partially level of satisfaction the second, normal level satisfaction third and dissatisfaction with internet resource facilities available in their institutions the last.

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