

GENDER DIFFERENCES IN COMPUTER USE SKILL AMONG STUDENTS OF SCHOOL OF HEALTH TECHNOLOGY, UFUOMA, DELTA STATE

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Abstract

Gender differences in computer use skill among students in School of Health Technology, Ufuoma, Delta State was examined in this study. The descriptive survey research design was adopted for this study. A sample of 200 students was selected from Health Technology Ufuoma, Delta State and used for the study. A two part questionnaire was used in eliciting information from the sample. The stated research questions were analyzed with the use of the simple percentage method. Based on the analysis, the following findings emerged, that; there was difference in computer use skill levels among students; that there was gender difference on the frequency with which students make use of computers; that there was no difference between the attitude of male and female students towards the use of computers; and that male students had a higher level of computer software use than female students and finally, that there was gender difference on the problems faced by students in the acquisition of skills and use of computer.

KEY WORDS: Gender differences, Computer use, skills, School of Health Technology.

Introduction

The aim of medical education in Nigeria is to produce competent physicians. And computer technology has brought very significant changes in both the teaching and practice of medical-health all around the world. The information needs of a medical student of the twenty-firth century has changed, and he or she is left with the choice of deciding what to read and where to get their information sources. Idowu, Adagunodo, & Idowu (2004) indicated that knowledge, skills and confidence with computer technology are now an asset for students whose aim is to use a variety of information sources. In order to be successful in academic programs and careers, it is essential that students possess improved computer skills (Furst-Bowe & Boger, 2006).

Computer literacy or skill is defined as the knowledge and ability to use computers and related technology efficiently, with a range of skills covering levels from elementary use to programming and advanced problem solving Lynch (1998). Computer literacy skill can also

refer to the comfort level someone has with using computer programs and other applications that are associated with computers (Wikipedia 2013). Anuobi (2004), described computer literacy as having a basic understanding of what computer is and how it can be used as a resource. Asuquo & Onasanya (2006) stated that many factors in and outside the classroom result in perceived gender differences in computer usage. Explaining further, Gurusurthy (2004), observed evidences that points towards gender imbalance in the use of computers and other technologies.

Shanahan (2006) believes that the health care industry is in a state of constant and rapid change and due to the increase in scientific knowledge and rapid technological advances, there has been a growing emphasis on the physicians need to efficiently access, retrieve, and use scientific evidences to improve patient care (Li, Tan, Muller & Chen, 2009). This scenario can be best achieved if medical/health students, especially students of health technology, Ofuoma, Ughelli have the requisite computer skills and the right attitude. Accordingly, the purpose of this study was to determine if there is a gender difference in the computer use skills of school of health technology students by looking at how they have access to computers, the frequency with which they use computers, if there is gender difference in the use of various software and look at problems they face when using computers.

Research Questions

The study was guided by the following research questions

- (i) Is there gender difference in computer use skill levels among students of school of health technology, Ufuoma?
- (ii) Is there gender difference on the frequency with which students make use of computers?
- (iii) Is there difference between the attitude of male and female students towards the use of computers?
- (iv) Is there any difference between the usages of computer software application among students?
- (v) Is there gender difference on the problems faced by students in the acquisition of skills and use of computer?

Review of Related Literature

Computer literacy consists of the experience and ability to operate computers, including knowing the structures of computer software and hardware, having the skills to operate computer software, and applying computer usage to social issues (Li, 2008). According to Tella and Mutula (2008), the issue of gender equity as far as access to and use of computer continues to be a topical subject not only in developing countries but the world over. However, available indices suggested that, although there is a gender gap in all countries, with the significant growth in access to and increased educational opportunities for more

women, the relative difference between men and women is diminishing (Sorenson, 2002, Kay, 2008 & Munusamy & Ismail, 2009).

Manda and Mulkangara (2007) reported that gender is associated with the use of electronic information resources, and that male students were more likely to use e-resources than female students. In the study carried out by Ramayah and Osman (2005), it revealed that male users had more computer usage skills than their female counterparts. Bakar, Meseran and Atan (2005) reported that males had more positive attitudes towards ICTs. Gupta's (2001) study also found significant gender difference in the way females and males rated themselves in their ability to master technology skills. Even though both genders were positive about their computer abilities, males rated themselves higher than females. Kay (2006) reviewed 36 studies on gender and computer use and concluded that the male correspondents have significantly higher perceived computer literacy.

Kumar and Kumar (2008) report that 161 (53.67%) in the total sample of 300 learn to make use of electronic information sources through trial and error, while half the population 150 (50 %) learn through advice from friends, and only 35 (11.67%) learned to use these resources by attending courses and training offered by the college. This implies that most of the users are aware of the importance of computer skill. From their study, they pointed out that there was slight difference between male and female students on computer use skills. Similarly, even in situations where male and female are given equal access, men are more likely to be main computer user than women (Becker and Sterling 2007; Idowu, Adagunodo, & Idowu 2004). Several investigations, especially Whitley (2007) and Jennings and Onwvegbuzie (2001) have reported that gender has no significant effect on any of the dimension of computer attitude studied.

Some researchers have also suggested that the factors such as gender and degree of exposure to ICT have influence on the ways that students use and apply computer software (Looker & Thiessen, 2003; Reddick, Boucher, & Groseilliers, 2000; Rideout, 2000). Looker and Thiessen (2002), for example, in their study looking at gender differences and computer application use among school students in Canada, have found that, generally, male students used apply computer software and computers more frequently than female students. Again, Bimber (2000) concluded that males were also more competent in using various computer applications than their female counterparts. However, Looker and Thiessen further argued that the findings of their study suggested that there was no significant difference between these two groups of students with respect to frequency of use and level of computer software application. On whether there was equality of access, usage and application of software between the women and their male counterparts, 199 (97.1%) answered in the negative while only 6 (2.9%) respondents confirmed that there was equality of access, usage and application of software (Olatokun, 2007). Again, Link & Marz's (2006) study showed that more male medical students (72%) had access to personal computers (laptops) and as well as having higher usage and application of software.

According to Ali (2005), a sizeable number of users of electronic resources especially the computer (almost 60%) are facing numerous problems such as lack of knowledge about the resources. He identified four (4) barriers to the effective provision of electronic resources users to include: lack of strategic planning; lack of inadequate or reliable funding to purchase computers; lack of use of internet to provide information services to users and a lack of consistent training for users in new ICT services. Furthermore, Said (2006) also agree to these problems when he identified inadequate electronic supply; lack of information retrieval skills for exploiting the internet through the computer, thus making the level of usage of computer by students very low. He also said that the use of database was poor due to lack of awareness, lack of access to computers, insufficient training and high cost of provision computer and its related resources.

Ameen (2006) noted that besides poor back-up sources for primary information system, the lack of power supply are commonly issued facing the usage of computer. Zakari (2009); Jagboro, (2007) also opines that the use of computers by students is plagued by epileptic power supply among others in their efforts their efforts to utilize the computer for network connectivity. On the other hand, Okiy (2010) pointed out that inadequate funding of libraries has been identified as a major obstacle to the acquisition (and usage of) computer technology. Another problem, as noted by Amadi (2010), which has inhibited the acquisition of computer skills by students, especially female students is domestic problem. In her study, 7.5% respondents who were vulnerable to early marriage stated that they became committed to family matters instead of education. They also reiterated the fact that females are the shelter of the house and therefore incline to domestic responsibilities. The females focus more on domestic work than studying and this affects their academic performance. The saying that goes thus “practice makes perfect” holds here and since computer technology demands a lot of practice, it therefore translates to poor skills where constant practice is lacking. It is evident that most of these studies have not been carried out on medical/health care students in Ofuoma, Ughelli area of Delta State of Nigeria, hence the reason for this study.

Methodology

This study will employ the descriptive survey research design, with the population of this study consisting of students in School of Health Technology, Ufuoma, Ughelli, Delta State, which is 2570. Selection of the sample size for the study was drawn using the stratified random sampling. By this method, the sample was divided into two strata or sub populations, that is, male and female, (Egbule and Okobia 1998). Using a random technique the researcher randomly selected 210 students from the two strata. The purposive sampling technique was further used during the administration on f the instrument. A questionnaire on gender differences in computer use skill was constructed. It was divided into two main parts. Part A contains the personal data of the respondents and Part B, divided into five different sections, holds information on the different areas which the study sought to provide answers. The data collected from the retrieved questionnaires will be analyzed using simple percentage and tables in the interpretation of results in the study.

Analysis of Data and Discussions

Table 1: Response Rate of the Questionnaire

	No of Respondents	(%)
1.	No. of retrieved Questionnaire 200	95.2
2.	No. of un-returned Questionnaire 10	4.8
	Total 210	100

The result from Table1, showed that of the 210 questionnaire distributed, 200 (95.2%) were found usable and 10 (4.8%) were not returned. This implies that there was a 95.2% returns rate for the questionnaires.

Table 2: Gender Distribution of Respondents

GENDER	No of Respondents	(%)
Male	100	50
Female	100	50
Total	200	100

Table 2 showed that 100 (50%) of the respondents were male while 100 (50%) were female. This implies that the percentage of female respondents were equal to the male respondents.

RQ 1. Is there gender difference in computer use skill levels among students of school of health technology, Ufuoma?

Table 3: Level of computer use skills

SN	Skills	Male Response	Female Response
i	Requisite search engine skills	90 (45%)	70 (35%)
ii	Appropriate skills in switching on and shutting down a computer system	92 (46%)	74 (37%)
iii	Knowledge of the structure of database	54 (27%)	36 (18%)
iv	Adequate skill in the use of formats such as PDF, JPEG, MPEG etc.	86 (43%)	62 (31%)
v	Adequate skills in searching/surfing the internet	94 (47%)	78 (39%)
vi	Adequate skill in formulating search queries	86 (43%)	62 (31%)
vii	Adequate skill in the use of electronic library tools e.g. CDROM, Subject Gateways etc.	80 (40%)	58 (29%)
viii	Adequate skill in opening and saving a document	82 (41%)	64 (32%)
ix	Appropriate skill in typesetting, editing and printing of document	64 (37%)	42 (21%)
x	Appropriate skill in drawing graphs and editing of pictures	56 (28%)	26 (13%)

Presented results in Table 4.4 reveals that 90 of the male respondents indicated having requisite search engine skills while on 70 female had the requisite skill. The analysis also shows that 92 (46%) and 70 (37%) of the male and female respondents indicated having appropriate skills in switching on and shutting down a computer system. The table also shows that there was difference between male and female respondents on the level of computer use skills in the following areas: knowledge of the structure of database (54 (27%) and 36 (18%) respectively), adequate skill in the use of formats such as PDF, JPEG, MPEG

etc, Adequate skills in searching/surfing the internet, adequate skill in formulating search queries (86 (43%) or 62 (31%) respectively); adequate skill in the use of electronic library tools e.g. CDROM, Subject Gateways etc, (80 (40%) and 58 (29%) respectively); Adequate skill in opening and saving a document (82 (41%) or 64 (32%) respectively); appropriate skill in typesetting, editing and printing of document (64 (37%) and 42 (21%) respectively) and finally, Appropriate skill in drawing graphs and editing of pictures (56 (28%) and 26 (13%) respectively for male and female students. This shows that there are gender differences in computer use skills among students of school of health technology, Ufuoma, it also implies that male students possess a higher level of computer use skill than female.

RQ 2. Is there gender differences in the frequency with which students make use of computers?

Table 4: Gender difference on the Frequency of Computer Usage

SN		Male Response			Female Response		
		Regularly	Occasionally	Never	Regularly	Occasionally	Never
i	MS Office Word	76 (38%)	18 (9%)	6 (3%)	46 (23%)	34 (17%)	20 (10%)
ii	MS PowerPoint	48 (24%)	30 (15%)	22 (11%)	28 (14%)	38 (19%)	34 (17%)
iii	MS Office Excel	50 (25%)	36 (18%)	14 (7%)	32 (16%)	36 (18%)	32 (16%)
iv	MS Office Paint	60 (30%)	30 (15%)	10 (5%)	36 (18%)	24 (12%)	40 (20%)
v	Corel Draw	66 (33%)	20 (10%)	14 (7%)	26 (13%)	36 (18%)	38 (19%)
vi	Windows Media Player	60 (30%)	22 (11%)	18 (9%)	46 (23%)	40 (20%)	14 (7%)
vii	Internet browsing	84 (42%)	14 (7%)	2 (1%)	50 (25%)	28 (14%)	22 (11%)
viii	Adobe Reader	38 (19%)	38 (19%)	24 (12%)	26 (13%)	30 (15%)	44 (22%)
ix	Nero Essentials	16 (8%)	22 (11%)	62 (31%)	6 (3%)	34 (17%)	60 (30%)
x	e-mail	80 (40%)	20 (10%)	0 (0%)	82 (41%)	18 (9%)	0 (0%)
xi	Chat	70 (35%)	20 (10%)	10 (5%)	84 (42%)	16 (8%)	0 (0%)
xii	games	60 (30%)	22 (11%)	18 (9%)	58 (29%)	30 (15%)	12 (6%)
xiii	CD/DVD-ROM	26 (13%)	34 (17%)	40 (20%)	20 (10%)	30 (15%)	50 (25%)
xiv	Electronic Book	16 (8%)	18 (9%)	66 (33%)	10 (5%)	16 (8%)	74 (37%)
xv	Electronic Journals	26 (13%)	34 (17%)	40 (20%)	12 (6%)	28 (14%)	60 (30%)
xvi	E-dictionary	24 (12%)	16 (8%)	60 (30%)	20 (10%)	20 (10%)	60 (30%)

The results indicate that there are differences between male and female students on the frequency of computer usage. The areas of difference where male students use computer more than female students are in the areas of MS Office Word, MS PowerPoint, MS Office Excel, MS Office Paint, Corel Draw, Windows Media Player, Internet browsing, Adobe Reader and games. This implies that male students make use of the above computer applications than female students. However, female students had a higher frequency of computer usage for Chat and e-mail messages.

RQ 3. Is there difference between the attitude of male and female students towards the use of computers?

Table 5: Gender difference on the attitude of male and female students towards the use of computers

SN	Attitudes	Male		Female	
		Agreed	Disagreed	Agreed	Disagreed
i	Computers and technology have made students more productive	96 (48%)	4 (2%)	92 (46%)	8 (4%)
ii	Gathering data for class assignments is simplified by using computers.	87 (40%)	13 (10%)	82 (41%)	18 (9%)
iii	I am comfortable when using computers for assignments	82 (41%)	18 (9%)	76 (38%)	24 (12%)
iv	I prefer getting information from a printed page instead of a computer screen.	84 (42%)	16 (8%)	78 (39%)	22 (11%)
v	The frustrations created by computers are more trouble than they are worth.	38 (19%)	62 (31%)	60 (30%)	40 (20%)
vi	Because computers and other technologies have all but eliminated the need to write on the job, writing is no longer a critical skill.	22 (11%)	78 (39%)	38 (19%)	62 (31%)
vii	Technology frees people from tedious work allowing them to concentrate on more difficult tasks.	70 (35%)	30 (15%)	74 (37%)	26 (13%)
viii	Using the PC would improve my performance	90 (45%)	10 (5%)	86 (43%)	14 (7%)

The analysis in table 5 on the attitude of male and female students towards the use of computers shows there is no difference between the two genders. The only difference is seen on the area where female students indicated that frustrations created by computers are more trouble than they are worth. Hence, the conclusion drawn here indicates that there is no difference between the attitude of male and female students towards the use of computers.

RQ. 4 Is there any difference between the usages of computer software application among students?

Table 6: Gender difference on the usages of computer software application among students

SN	Applications	Male Response	Female Response
i	Microsoft Office Word	94 (46%)	80 (40%)
ii	Microsoft Office PowerPoint	78 (39%)	66 (33%)
iii	Microsoft Office Excel	86 (43%)	68 (34%)
iv	Microsoft Office Paint	90 (45%)	60 (30%)
v	Corel Draw	66 (33%)	62 (31%)
vi	Windows Media Player	82 (41%)	86 (43%)
vii	Internet browsing	98 (49%)	78 (39%)
viii	Adobe Reader	76 (38%)	56 (28%)
ix	Nero Essentials	38 (19%)	40 (20%)
x	e-mail	100 (50%)	100 (50%)
xi	Chat	90 (45%)	100 (50%)
xii	Games	90 (45%)	88 (44%)
xiii	CD/DVD-ROM	60 (30%)	50 (25%)
xiv	Electronic Book	34 (17%)	26 (13%)
xv	Electronic Journals	60 (30%)	40 (20%)
xvi	E-dictionary	40 (20%)	40 (20%)

Table 6 gives the analysis on the usage of computer software application among students. The analysis reveals that more male students than female students make use of computer software than female students. The only exception where female students had a higher level of computer software application usage is on Chat and on Nero Essentials.

The analysis, thus far implies that there is difference between the usages of computer software application among male and female students. Male students had a higher level of computer software use than female students.

RQ. 5 Is there gender difference in the problems faced by students in the acquisition of skills and use of computers?

Table 7: Gender difference on the problems faced by students in the acquisition of skills and use of computer

SN	Problems	Male Response	Female Response
i	Lack of requisite skills	10 (5%)	30 (15%)
ii	Epileptic power supply	76 (38%)	80 (40%)
iii	Lack of fund to purchase computer tools	56 (28%)	60 (30%)
iv	lack of information retrieval skills	38 (19%)	52 (26%)
v	Access to information or materials	40 (20%)	60 (30%)
vi	The problem of gender	6 (3%)	56 (28%)
vii	Domestic problem	38 (19%)	64 (32%)
viii	Inadequate ICT application facilitates	56 (28%)	70 (35%)
ix	Lack of awareness on the part of students	38 (19%)	52 (26%)
x	Poor maintenance culture of computer	56 (28%)	68 (34%)

The result in table 7 shows that a higher proportion of female respondents indicated lack of requisite skills as a problem faced by students in the acquisition of skills and use of computer, 76 (38%) male students and 80 (40%) female students indicated epileptic power supply as a problem; lack of fund to purchase computer tools were seen by both genders (28% and 30% respectively) as a problem Female students were also found to differ on the problem faced by students in the acquisition of skills and use on the following areas: Access to information or materials for male students was 40 (20%) while female students had 60 (30%), lack of information retrieval skills, males scored 38 (19%) and female students had 52 (26%).

This findings from this study is line with Manda and Mulkangara (2007) who reported that gender is associated with the use of electronic information resources, and that male students were more likely to use e-resources than female students. Furthermore, in support of the above findings, Ramayah and Osman (2005) revealed that male users had more computer usage skills than their female students' counterpart. And on the part of Ansari and Zuberi

(2010), they found gender difference in the use of computers between male and female students. According to them, male students had more computer skill knowledge than their female counterparts

Also, the findings of Rajab & Baqain (2005); Munusamy & Ismail (2009) supported the results from this study. In their study they posited that a significant difference was found between males and females in the length of time they used computers. Gefen and Straub (2007) also found that there were differences in perception of male and female in terms of frequency of computer usage. Whitley (2007) and Jennings and Onwvegbuzie (2001) reported that gender has no significant effect on any of the dimension of computer attitude. However, the finding disagrees with that of Ono & Zavoday (2003) who stated that some gender differences have been found in attitude towards computer technology intensity of internet use Also research by Levin & Gordon (2009) found that men and boys have significantly more positive attitude towards computer and more stereotyped attitudes regarding who is capable of using them.

Male students had a higher level of computer software use than female students. This finding is in consonance with Tella & Mutula (2008) who pointed out in their study that there is marked significant gender difference in application use of computer by male and female subjects. Likewise, Looker and Thiessen (2002) in their study looking at gender differences and computer application use among school students in Canada, have found that, generally, male students use and apply computer software and computers more frequently than female students.

Conclusions and Recommendations

Gender differences exists in computer use skill levels among students of the school of health technology, Ufuoma. The frequency of use of computer differs between male and female students. Male students had a higher frequency of computer usage than female students. No difference exists between the attitude of male and female students towards the use of computers, male students had a higher level of computer software use than female students and Finally, differences exists between male and female students on the problems faced by students in the acquisition of computer skills and use. The study recommends that university libraries should be adequately funded so as to enable them acquire relevant computers for students use in the library. Also, academic libraries should be provided with adequate electricity to enable students use computers without any hindrance. Students should be encouraged to own their personal computers and orientation programmes should be regularly organized by the institution on the need for the acquisition of computer knowledge.

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IMS UNISON UNIVERSITY DEHRADUN LIBRARY - A CASE STUDY

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Abstract

This paper is a case study of the University of IUU Library as an attempt the present's information about the city Dehradun, University of IUU and its Library matters, Plan, Collection, library building, information resources, facilities and services, library automation, etc. This case study identifies inadequate provision of information services, reference services, indexing and abstracting and other bibliographic services, inter library loan services.

Key Words: Library Services, Library Automation, IUU University Library, Digital Library.

Introduction

The educational institution case study research provides a detailed description and an understanding in depth of a single phenomenon - such as an issue, policy and service provision. It is usually carried out within a much more limited timescale than an ethnographic study and is likely to have interviews and documents as its main data sources. Koul (2007) state that in a case study, the researcher attempts to examine an individual or unit in depth. The relevant data about the present status, past experiences, and environmental forces that contribute to the behavior of the individual or social unit, and how these factors relate to one another. The analysis of the factors and their inter-relationships, help the researcher to construct a comprehensive and integrated picture of the unit.

Dehradun, the City

The glorious history of Dehradun first finds its mention in the Indian mythological stories that recount the power of the place. According to one of the oldest scriptures, Skanda Purana, Dehradun was a part of 'Kedar Khand', the abode of Lord Shiva. Another belief states that

Dronacharya, the great scholar and teacher of Pandavas and Kauravas of Mahabharata, lived in this place. Hence, this place was also known as 'Drona-nagri'. According to another belief, numerous Lords and famous personalities visited this place to seek peace and enlightenment. As per Ramayana, Lord Rama and Lakshmana underwent atonement for themselves for killing Lanka King Ravana in this place. The later records of the city tells you that the founder of Sikh faith, Sri Guru Nanak sought shelter in the city of Dehradun during mid 1400s and it was he who named the camps as Dehra-camp and Doon-Valley.

The name Dehradun is derived from two words 'Dera' and 'Dun', implying 'camp' and 'valley' respectively. The city was named as Dehradun as it is placed in the midst of beautiful Shivaliks and Himalayas. As per the historical records, the present day Dehradun came into existence in 1675 with the settlement of Guru Ram Rai, the son of seventh Sikh Guru Har Rai. With the passage of time, the place witnessed spectacular reign of Garhwal Kingdom who ruled this place for many years with only minor interruption from the Rohillas and the Rajputs during 1757-75. However, with the invasion of Gurkhas or Nepalese into the region, the Garhwals lost their power on Dehradun in 1803. Tea plantation started by Britons in 1863 serves as the major source of income for the city. Many of the noted tea growing regions like Sirmour, Kargi and Banjarawala are now slowly turning into residential areas. However, some of the surviving tea estates of the city help to maintain the identity of the place. The tea grown in this region is known for its unique taste and aroma and is in great demand globally. From this city, the tea is supplied to Delhi, Punjab, Jammu, Kashmir, Pakistan, Afghanistan and even England.

IMS Unison University

IMS Unison University, a constituent of Unison Group is a premier educational and research University nestled amidst beautiful and serene surroundings offering an environment that fosters learning and stimulates creativity. It started in 1996 as IMS Dehradun, a non- profit organization set by a group of visionaries dedicated to the cause of changing the face of professional education in Northern India. The University today provides a platform for excellence in teaching, learning, and administration. State- of- the- art Information Technology is extensively used in the University contributing to the development of well trained graduate, post- graduate and doctorate students to fulfill the manpower needs of the corporate world.

The University of IMS Unison University (IUU) was established wide Government of Uttarakhand ordinance No. XXIV (6)/2013, the Uttarakhand gazette, March 12, 2013. The IMS Institute is become the IMS Unison university of Dehradun. In accordance with the provisions of this ordinance.

The University of IUU has become a legendary centre of higher education. The programmes are very much part of research context, with student enjoying the benefits of working with research scholars, who are not only teaching but also ensuring that the latest developments are integrated into our study programs at different levels. The most attractive university by

recruiters especially in the field of Business Management, Computer Application, Law and Mass Communication. The University has gone through a number of institutional reforms aimed at quality assurance in teaching and research. A number of newly emerging disciplines have been added to make the University education relevant to the future needs of the society. Similarly, to cater the needs of the Faculty and the students, over 915 computers have been installed in the University and the number is continuously increasing at a rapid pace. A Local Area Network (LAN) service is also available for access to the new knowledge in global environment. The University of IUU has highly qualified, experienced and dedicated faculty, which is offering quality education and conducting meaningful research in Management, Law and other professional fields.

Methodology

The following method approach has been used for collecting the data for this case study:

1. The multi-method approach used for collecting the data.
2. Interviews and discussions.
3. Faculty members and students participation.
4. Questionnaire survey: Questionnaire and semi- structured interview were used in the study, together with interviews and discussion with the faculty and the students.

Objectives

The following objectives are:

1. To know the all aspects of the library i.e. library building, physical layout administrative structure, services and facilities being provided, rules, collection, acquisition, facilities and services, library automation etc.
2. Suggestions for the improvement of library.

The University Library

This section of the study presents the comprehensive information about the Library of IUU. The Library serves as knowledge storage and retrieval centre. The Library is named as Central Library (SOMC). Before the construction of Central Library there were three departmental libraries in different places of the University. These are:

1. Library School of Management (Central Library)
2. Library School of Law
3. Library School of Computer Applications

4. Library School of Mass Communication

Digital Library (Online Database)

The University library is non profit and development organizations with access to international scholarly literature based on electronic (online) delivery, providing access to high quality, peer-reviewed journals, databases, articles and e-Books across a wide range of disciplines. The library has a unique feature of having separate digital library in which 32 computer systems with printers' internet connection are installed for the students, faculty members and research scholars to access the online digital material.

EBSCO – Business Source Elite – Plus : E Books – Title Across different subject areas over 118,000 titles, Case Studies – 6000, Full Text Journals & Magazines – 1307, Full Text TV & Radio News Transcript – 913000.

IEEE ASPP – 145 Journals plus Back File to 2000.

DELNET Membership - Union Catalogue of Books – 18151784 records, Union List of Journals – 36940 records, Articles Database – 912042 records, Union List of CD-ROMS – 22234.

Computer Society of India (CSI) – Membership

SCC – Online : Indian Law - Supreme court of India, Privy council, federal court, All High Courts, Central Statutes with Rules, Regulation, Journal Articles, Law Commission Reports, Assembly Debates, Commissions and Tribunals.

Foreign Law and International Law: English Law, US Supreme Court, Supreme Court of Canada, Singapore Law reports, Constitutional Court of South Africa, Bangladesh Legal Decisions, International treaties and conventions

Lexis Nexis - Supreme Court Cases, All High Courts Cases, Privy Council, Academic Indian Journals, All Tribunals and All Central Acts, All Academic Online Commentaries/E-books.

International - All Premium Law Review and Journals from US.

Manupatra – Case Law Database, Legislation Database, Notification Database, Business and Policy Database.

AIR Offline Digital Database - AIR Supreme Court Cases Data Base (Four Connections), AIR High Court Data Base (Four Connections), Criminal Law Journal data Base (Four Connections), AIR Online Institutional Version (Four Connections).

The e-book will allow researchers to access most of the important text and reference books electronically in a variety of subject areas.

Library Resources

The library has a total 50321(as on 30 sep. 2014) books on various subjects e.g. Management, Law, General Books, Autobiography, Fictions, Mass Communication and Computer Application. The library services approximate 600 users a day.

Table: 1. Library resources

S. No.	Library Collection	Quantity
1.	Business Management	25010
2.	Fiction	350
3.	Autobiography	150
4.	Personality Development	1146
5.	Mass Communication	1125
6.	English Language	800
7.	General Books	1150
8.	Computer Application	15930
9.	Law	4660
Total		50321

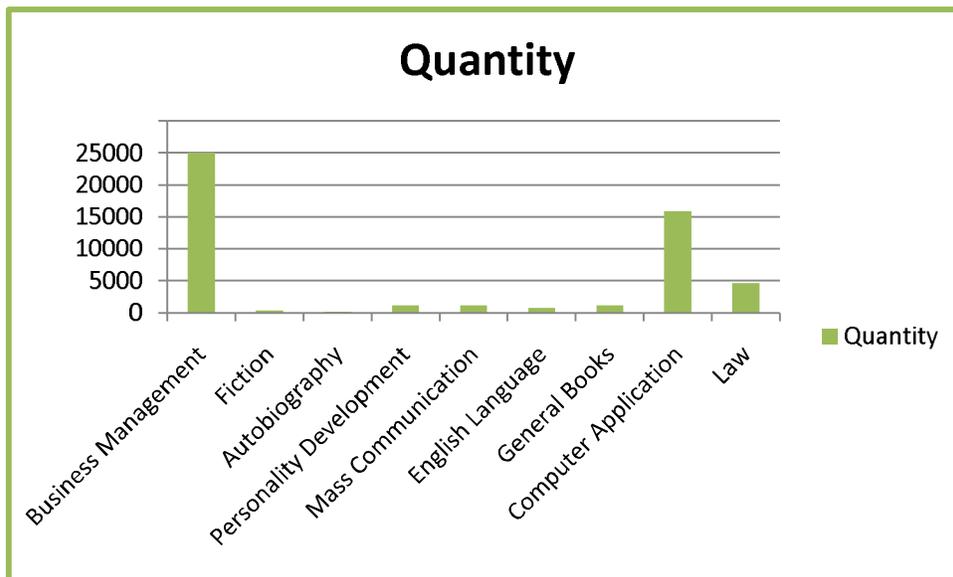


Table: 1 Graphical representation of library collection

Table: 2 Subject wise collection in the library

S. No.	Classes	Subjects	Total
1	000	General Works Including Computer Science, Library and Information Science and Mass Communication	11055
2	100	Philosophy (Psychology, Logic, Ethics, etc)	350
3	200	Religion / Hindu	50
4	300	Social Science (Economics, Sociology, Political Science, Law)	5060
5	400	Language (Hindi, English)	100
6	500	Pure Science (Math's)	3500
7	600	Applied Science (Electronics, Management, Financial Management)	27206
8	700	Fine Arts (Architecture and Others)	700
9	800	Literature (Fictions)	1300
10	900	History, Geography and Biographies	1000
		Total	50321

The library also has a collection of 3500 Masters Projects and it has also a collection of 550 CD's on various subjects.

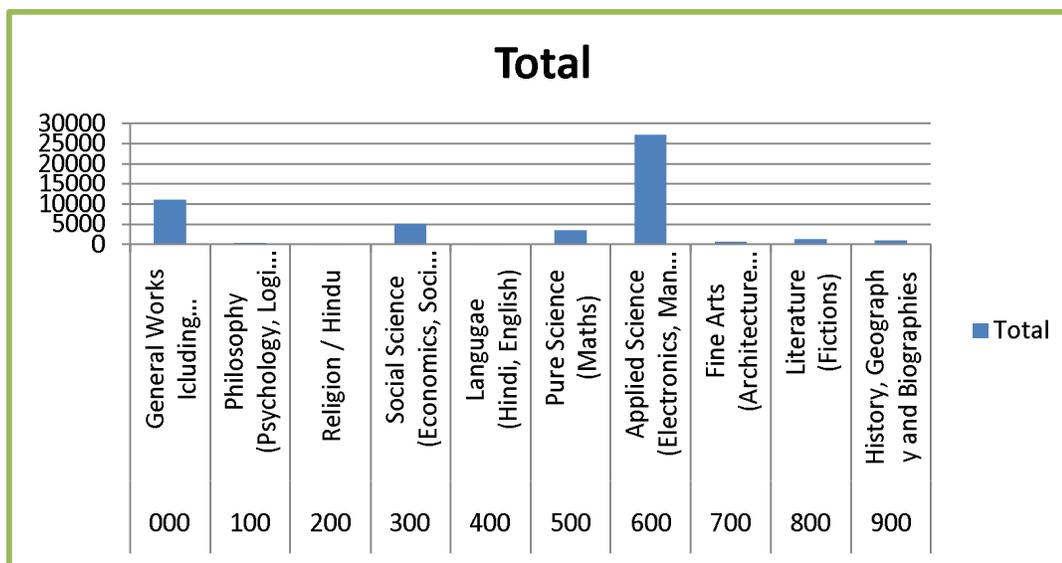


Table: 2. Graphical representation of Subject wise Collection

Library Building

The Central library has a beautiful and well looking newly constructed building. The library is located administrative block at the near of main entrance gate of the University. The total covering area of library is 1268.77 sqm., and equipped with all necessary and modern learning facilities. There are open stack areas, students' study halls and office. The building is fully air-conditioned.

Acquisition Process

The University library of IUU has on approved written library acquisition policy. It indicated that librarian is responsible for the maintenance and development of library collection, facilities and services. The guide line to library staff about selection criteria, ordering of books and periodicals, accessioning. The Faculty of the relevant department's library and the librarian are responsible for the selection of material. The library also accepts gifts and donations of materials.

Classification and Cataloguing

The DDC Scheme 22nd edition is used to classify the books. There is no Catalogue in the library. Library has open stack access. Books are placed on the shelves according to the classified order.

Library Automation

The University library is in the Automation process by the library software Libsys 6.7 is complete, comprehensive library system that manage all aspect of all kind of libraries, Libsys modules include cataloguing , Circulation , Serial Control, Acquisition, Web OPAC, Inventory management and System management.

Libsys is fully integrated Information management system which uses a shared database eliminating the need for redundant data entry. Transaction take place in real time, which ensures that whatever information is displayed, is accurate and up to date. It runs all modules concurrently and allows the user to move quickly and easily between modules.

General Features:

- A Multi-tier Client /Server architecture relying on a database Microsoft Server 2000.
- Scalable and Customizable
- Graphical User Interface (GUI)
- Web enable

- Adherence to International standards (MARC, Z39.5, EDI, Unicode, etc.)
- Multi- lingual Support (Arabic, English, and others 3 language) with multidirectional
- Libsys comes complete with integrated image storage and retrieval capabilities, and the ability to make link to other type ,such as word , Excel or PDF files, from within a catalogue record.
- Including archive management and cataloguing function.
- Easy and powerful Application administration.

News Papers and Periodicals

The University library has subscribes the 40 national news papers, 3 news papers are in Hindi and rest of news papers in English and the library is subscribing 56 periodicals.

Library Membership

The University Library provides the membership to its students, faculty members and researchers to use the library. Is also extends the services to the outsider who seek the information from our library.

Table: 3 Yearly enrolments (Membership) of the students.

S. No.	Year	No. of Students	Percentage%
1	2007 -08	1950	13
2	2008-09	2200	14
3	2009-10	2250	15
4	2010-11	2100	14
5	2011-12	2200	15
6	2012-13	2325	15
7	2013-14	2050	14

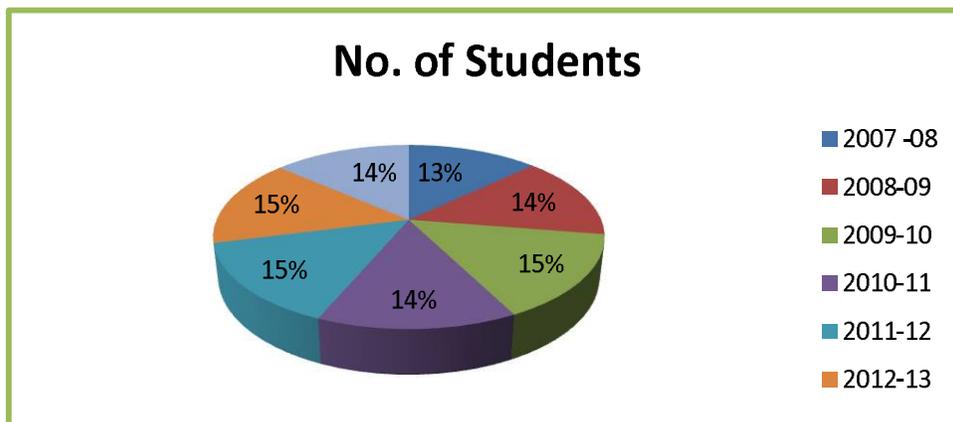


Table: 3 Graphical representation of yearly enrollment

The registered members for borrowing the Library resources as per their entitlement are given below borrower categories:

Borrowers Type	No. of Books that can be Issue	Issue Period	Overdue Charges
Professor	10	180 Days	Not Applicable
Associate Professor	10	180 Days	Not Applicable
Assistant Professor	10	180 Days	Not Applicable
Lecturer	10	180 Days	Not Applicable
PG Students	7	15 Days	Applicable
UG Student	5	15 Days	Applicable
Law Student	5	15 Days	Applicable
Research Scholar	7	15 Days	Applicable

Library Services for Users

Library Provides number of services to its users like Reference Services, Photocopy Services, Circulation Service. Library has provided Wi-Fi connection to its readers so that they can use their laptops to search the internet. Particular password is given to users.

Library Hours

- Library timings will be from 9:00 a.m. to 9:00 P.M., but Circulation timings will be from 9:30 a.m. to 5:00 p.m.
- The library will be closed on Sundays & Gazetted holidays as per IUU list of holidays.
- The library will be closed for one month for annual stock verification during summer vacations.

Conclusion

The analytical study of the library shows that the urgent need for improvement and betterment in various areas need to be improved, e.g. automation process and services and reference services. The proper security measures should be ensured to stop the book theft and other library resources. It is also suggested that library security system “Radio Frequency Identification” (RFID) should be installed in the library. RFID (Radio Frequency Identification) is the latest technology to be used in library theft detection systems. RF

(Radio Frequency) systems, which have been used in libraries for decades, RFID-based systems move beyond security to become tracking systems that combine security with more efficient tracking of materials throughout the library.

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KNOWLEDGE AND AWARENESS OF INFORMATION LITERACY AMONG B.TECH. STUDENTS: A CASE STUDY OF ENGINEERING COLLEGES OF JAIPUR RAJASTHAN

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Abstract

This research paper presents the knowledge and awareness of information Literacy among B.Tech students of engineering colleges of Jaipur, Rajasthan. The purpose of the study was to assess the B.Tech. (Engineering & Technology) student's information Literacy skills. To collect data from the respondents a structured questionnaire was used. Total 400 questionnaires submitted to 40 engineering & Technical colleges of Jaipur City, Rajasthan (each college 10 questionnaire). The data collection was completed during March to July 2014 by personal visit in every college. The result of study found that information literacy skills are providing important role among students of engineering colleges. Some suggestions have been also given to in corporate information literacy among the engineering college students.

Keywords - Awareness, Information, Information Literacy, Engineering & Technology, Jaipur.

1. INTRODUCTION

Present era is an information era and full of information and communication Technology enabled services in every field of human life. Information is being codified in digital form. So role of information literacy is important in our society. Information Literacy is vital skill to survive in digital era. Information literacy is important in the contemporary environment of rapid technological change and proliferating information resources.

Today contemporary society is called knowledge society where information has become a valuable resource of value and its production and consumption level is an index to the social, economic, technological and academic advancement of the society. For driving smoothly the role of technology is increased in the society. The new information technology with its tools such as computer, internet is the current of the manifestation of the important role that information is playing in all sector of society. So knowledge of information literacy is must to be handling these information Technology.

Information literacy is survival skill in the new information age which is challenging the common man with advance of information every day. Information literacy works as a life jacket to save the human brain from unwanted and unnecessary information flood. According to American library association's final report states "To be information literate a person must be able to recognize when information is needed and have the ability to locate, evaluate and use effectively the needed information".

2. SCOPE OF THE STUDY

It has been observed that there be a major gaps in engineering students information skills. Knowledge of use of information technology tools should have to engineering students. The main scope of the study confines to focus on knowledge of information skills of engineering and Technology students in identifying locating searching, accessing, retrieving and using information. The study include B.Tech students of various branches like Civil Engineering, Electrical, Mechanical, Computer science, Information Technology are studying in various engineering college affiliated to Rajasthan Technical university, Kota located in Jaipur.

3. OBJECTIVE OF THE STUDY

The present study knowledge of information literacy among B.Tech. students of engineering colleges of Jaipur, Rajasthan has tried to find out the information literacy among the engineering students. The study was carried out under the following objective-

1. To know knowledge of using tools of Information Technology.
2. To identify the most preferred documents in the library by the engineering students.
3. To know the student frequency to visit their college library.
4. To identify the competency level of information Literacy among the B.Tech. students of engineering colleges, Jaipur.
5. To find out the areas in that the students lacking information skills.
6. To make suggestions on how the information literacy skills increased to the engineering students.

4. RESEARCH METHODOLOGY

The Population of the study was engineering college students of Jaipur city. There are about 50 engineering colleges in the Jaipur and we have selected 40 colleges for the study. A

questionnaire has designed to collect the data from the respondents. Questionnaire were in multiple questions and simple in English. Each of college 10 questionnaires was distributed among the students of different branches. Total 400 questionnaires have distributed to 40 colleges. Out of Four hundred questionnaires only 360 respondents received back. The response rate was 90% and finally for result of study investigator selected 360 questionnaire for analysis and interpretation the data.

5. LIMITATION OF THE STUDY

The study focus on information literacy skill among B.Tech. Students of in identify searching. Retrieving and using information from these library both print and electronic sources of information. The investigator has collected data only from the engineering and Technical students who were available in the college campus of libraries of the selected engineering colleges during January 2014 to July 2014, even semester of the students. Only 40 private engineering colleges affiliated to the Rajasthan Technical University have selected for the purpose of this study.

6. ANALYSIS OF COLLECTION OF DATA

Total 13 questions intended by judge the information literacy skills of the B.Tech students of engineering college-

Table. No. 1. Gender wise distribution of respondents

Gender	Total	Percentage
Male	207	57.5%
Female	153	42.5%
Total	360	100%

Above table no 1. Shows the gender wise distributions of respondents. The numbers of male respondents 207 than the female counter part 153 respondents.

Table-2. Frequency of visit to the engineering college library.

S.No.	Frequency	Total	Percentage
1	Daily	119	33.5
2	Twice in a week	57	15.83
3	Once in a week	46	12.77
4	Free time	77	21.38
5	Library period	89	24.72
	Total	360	100

The revolved from the data of above table 2 shows that majority of students (33.5%) are visiting the library daily followed by their library period (24.72%). Twice in a week 15.83% and 12.77% respondents visit the library once in a week. A good numbers of 21.38% respondents visited when they have free time. The result shows that students have followed their library period also in the engineering college libraries.

Table 3. Use of Available Documents in Library

S.No.	Document Type	Total	Percentage
1	Text Books	264	73.34
2	Reference Books	31	8.62
3	News paper	38	10.55
4	Periodicals	20	5.55
5	Thesis & Dissertation	7	1.94
	Total	360	100

Table-3. Indicates the frequently document used by the B.Tech. Student in Jaipur. Majority of student (73.34%) are using textbooks available in the library related to their course work and syllabus. Followed by newspapers 10.33% and Reference Books were used by 8.62% respondents, periodicals 5.55% and thesis & dissertation were used 1.94% only.

Table -4. Methods used by B.Tech students to search documents in library.

S.No.	Methods used by students	Total	Percentage
1	Search book shelve directly	248	68.87
2	Taking assistant from the library staff	94	26.10
3	Taking assistant from friends	11	3.50
4	Used OPAC	7	1.93
	Total	360	100

Above table 4 shows the searching method of respondents in their library. Most of students found or searched their books in library by self approach. 68.88% approached directly, 26.11 were searched by assistant of library staff, 3.5% with friends and 1.94% respondents took the assistance of OPAC.

Table -5. Are you usage internet to collect information for your study purpose?

S.No.	Response	Total	Percentage
1	Yes	220	61.12
2	No	140	38.88
	Total	360	100

The above table no.5 shows that use of internet among B.Tech. students and depending of them are more in their studying. Modern era is information era and majority of respondents (61.12%) were used internet for their study purpose. However 38.88% students gave their statement as no used internet.

Table -6. Frequently used search engine.

S.No.	Search engines	Total	Percentage
1	Google	298	82.78
2	Yahoo	40	11.11
3	Alta Vista	14	3.89
4	Other	8	2.22
	Total	360	100

Above table no. 6 indicate the most of students used search engine by the responds, Majority of the respondents (82.78%) were used Google search engine followed by 11.11% used yahoo, 3.88% alta vista and some also user others were 2.22% respectively. The Google search engine in top position for getting information from internet.

Table-7. Knowledge of using Boolean operators.

S.No.	Boolean operations	Total	Percentage
1	Or	56	15.55
2	And	218	60.56
3	Not	68	18.89
4	Any	18	5.0
	Total	360	100

Table No. 7 revolved the data about knowledge or awareness of using search words for retrieve data. The majority of respondents (60.56%) have answered that and operator is more helpful for retrieve the greatest no of record. Mostly students are not knowing the using Boolean operator because most of students respondents have tick on “AND” operator but only 15.55% are give right answer OR. This indicates that need to be training for searching the Boolean operators.

Table -8. Are you aware on creating a safest password?

S.No.	Password	Total	Percentage
1	dldfy	86	23.88
2	98765	40	11.12
3	SRI GANESH	31	8.62
4	Bd*51%	170	47.22
5	Abc786	33	9.16
	Total	360	100

Awareness of creating a good and secure password is essential and keeps out identity safe on the web era. The answer of the question of awareness about safe password. Most of the respondents (47.29%) have good answer (result in table 8). Because a good and safe

password is a alpha numeric with special character using small and capital letter in the password. Another 23.88 % response that small letter (dccb), 11.12% is their phone no. or any numeric no. their name is 8.62%, total 9.16% students also accept that alphanumeric password is a safe password.

Table No 9. Knowledge of plagiarism

S.No.	Knowledge of plagiarism	Total	Percentage
1	Knowledge of plagiarism	162	45
2	Is it got permission to copy of another work	43	11.94
3	Plagiarism is a software	88	24.45
4	In correct use of footnote	30	8.34
5	No any idea	37	10.27
	Total	360	100

Table No-9. Shows the awareness of B.Tech. students about plagiarism. The respondents shows that majority of students (45%) know about plagiarism only 10.27% students of B.Tech. said no idea about plagiarism. 24.25% respondents given their idea that the Plagiarism is a software.

Table No- 10. Knowledge of Citations.

S.No.	Sources of citations	Total	Percentage
1	Periodicals	195	54.17
2	Books	70	19.44
3	Chapter of Book	45	12.51
4	Proceedings	14	3.88
5	No Know	36	10
	Total	360	100

Above Table No. 10 show the result of knowledge of citations, all scholarly and research writing it is necessary to document the source work with citations. For this purpose knowledge of citation an important is this study result shows that majority of students (54.17) given answer rightly, rest of the respondents does not right answer.

Table No -11. Knowledge of open source software.

S.No.	Response	Total	Percentage
1	Yes	315	87.5
2	No	45	12.5
	Total	360	100

Table No-11. Revealed the knowledge of open source software among B.Tech. students of engineering colleges, It is the good and positive answer that majority of respondents (87.5%) have aware about open source software they like daily was only 45 respondents (12.5%) have not knowledge of open source software.

Table No- 12. Use of social networking site like face book, whats app, continuous.

S.No.	Usages	Total	Percentage
1	Continuous usage	206	57.22
2	Use in a week	63	17.5
3	Not fix time	69	19.16
4	Not use	22	6.12
	Total	360	100

Table No-12. Show the interest of social networking the B.Tech. students. Majority of students (57.22%) are using social networking site and other continuous. 17.5% students used once a week, 19.16% not fix time. However in the mobile internet era 6.12% responded more are use of these type sites.

7. RECOMMENDATION AND SUGGESTIONS

The every engineering college library should conduct an orientation program for the students especially for the new or first year students on how to use and what information contained in various reference sources like dictionaries, encyclopedias, directories, yearbooks, thesis and dissertation etc.

- Librarian should also help to students for training and knowledge of information literacy at the libraries premises.
- In co-ordination with the teaching faculty the librarian should design an information literacy course module to train the engineering & technical students.
- Faculty member should inspire students to explore the unknown after guidance on how to fulfill information needs.
- RTU should have included a chapter on information literacy on their course syllabus for students.

8. CONCLUSION

Information literacy is an important component in any engineering education system. The present study to assess the information literacy skills of the engineering students (B.Tech. students) of different branch and different colleges at Jaipur, Rajasthan affiliated with Rajasthan Technical University, Kota. The finding revealed that in the engineering colleges, mostly visited to library issues the text books for their study. The result show that information literacy of information Technology is not good in engineering college of Jaipur. Most of students are seeing that best source of information in library for their study is a text

book but they do not know that many other primary information resources also available in library like periodicals, encyclopedia, E-journal etc. Most of the students have visited the library when they have free time or library periods.

The engineering college's management principal and faculty members and librarian should also be aware that students will not on their own pick up the necessary information literacy skills. The engineering students find it difficult to construct search strategies to retrieve relevant information to navigate different Information Communication Technologies and evaluate and select quality information.

9. SUGGESTION

Following suggestion should be helpful for improving information literacy of the B.Tech. students.

1. College library should be organized an orientation programme for the new comers (B.Tech. students) on how to use library and their resources like dictionaries, encyclopedias, Journals and Magazines, Reference Books, Thesis and dissertations. The librarian can also give training on gone to use OPAC in library in this programme.
2. Rajasthan Technical University should include a chapter in the curriculum on information Literacy and make compulsory for every students.
3. College Management should provide enough infrastructure of information literacy programme.
4. By the help of faculty, librarian could design an information literacy course for the help of B.Tech. students.
5. Government also should design and develop the Information library curriculum at different levels of education initiate higher educational institutions.
6. To conduct regional level seminars, Workshops, Conference be organized by collaboration of engineering colleges & university. To redefine and restating the role of information literacy in the growing digital environment.

10. CONCLUSION

Information Literacy is an important tool for the students of engineering colleges. Information Literate students are more effective consumers of information resources. They learn to recognize that information is packaged in a variety of ways. The main aim of present study is to develop the information literacy skills or Information literacy knowledge for the B.Tech. students of engineering & Technical colleges. The major finding shows that information literacy in an important and very helpful for their study. Because information literate students are more critical when they make decisions about the resources they use. In this study the finding revealed that majority of B.Tech. students have visited the library daily (33.05%), followed by respondents (73.33%) are visiting to library fort use of library resources, "Textbooks". Because textbooks more help of students in there study. Mostly respondents (68.88%) at their library directly approach to shelves for searching the

documents. Mostly respondents (61.12%) were using internet for their study purpose. Google is on first priority for searching information by respondents (82.78%). In the choose of password for security, only 47.22% respondents were chosen there password included alphabetical small & capi8tal, number and special sign. Rest was not selecting the good password. 45% students know about plagiarism, 54.17% respondents have knowledge of citation copy right and others result also show that social networking are useful for share information among the B.Tech. students.

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BASICS IN HUMAN RESOURCE MANAGEMENT

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Abstract

Human resource management (HRM or simply HR) is the management of an organization's workforce, or human resources. It is responsible for the attraction, selection, training, assessment, and rewarding of employees, while also overseeing organizational leadership and culture, and ensuring compliance with employment and labor laws. HR is a product of the human relations movement of the early 20th century, when researchers began documenting ways of creating business value through the strategic management of the workforce. The function was initially dominated by transactional work such as payroll and benefits administration, but due to globalization, company consolidation, technological advancement, and further research, HR now focuses on strategic initiatives like mergers and acquisitions, talent management, succession planning, industrial and labor relations, and diversity and inclusion. HRM is the organizational function that deals with issues related to people such as compensation, hiring, performance management, organization development, safety, wellness, benefits, employee motivation, communication, administration, and training.

Keywords:

Human Resource Management, Strategic HRM, Human Resource Planning

INTRODUCTION:

We often hear the term Human Resource Management, Employee Relations and Personnel Management used in the popular press as well as by Industry experts. Whenever we hear these terms, we conjure images of efficient managers busily going about their work in glitzy offices. In this article, we look at the question “what is HRM?” by giving a broad overview of the topic and introducing the readers to the practice of HRM in contemporary organizations. Though as with all popular perceptions, the above imagery has some validity, the fact remains that there is much more to the field of HRM and despite popular depictions of the same, the “art and science” of HRM is indeed complex. We have chosen the term “art and science” as HRM is both the art of managing people by recourse to creative and innovative approaches; it is a science as well because of the precision and rigorous application of theory that is required.

HRM is that it is the process of managing people in organizations in a structured and thorough manner. This covers the fields of staffing (hiring people), retention of people, pay and perks setting and management, performance management, change management and

taking care of exits from the company to round off the activities. This is the traditional definition of HRM which leads some experts to define it as a modern version of the Personnel Management function that was used earlier.

DEFINITION OF HUMAN RESOURCE MANAGEMENT:

The first definition of HRM is that it is the process of managing people in organizations in a structured and thorough manner. This covers the fields of staffing (hiring people), retention of people, pay and perks setting and management, performance management, change management and taking care of exits from the company to round off the activities. This is the traditional definition of HRM which leads some experts to define it as a modern version of the Personnel Management function that was used earlier.

The second definition of HRM encompasses the management of people in organizations from a macro perspective i.e. managing people in the form of a collective relationship between management and employees. This approach focuses on the objectives and outcomes of the HRM function. What this means is that the HR function in contemporary organizations is concerned with the notions of people enabling, people development and a focus on making the “employment relationship” fulfilling for both the management and employees.

These definitions emphasize the difference between Personnel Management as defined in the second paragraph and human resource management as described in the third paragraph. To put it in one sentence, **personnel management is essentially “workforce” centered whereas human resource management is “resource” centered.** The key difference is HRM in recent times is about fulfilling management objectives of providing and deploying people and a greater emphasis on planning, monitoring and control.

SCOPE OF HUMAN RESOURCE MANAGEMENT:

The scope of HRM is extensive and far-reaching. Therefore, it is very difficult to define it concisely. However, we may classify the same under following heads:

- **HRM in Personnel Management:** This is typically direct manpower management that involves manpower planning, hiring (recruitment and selection), training and development, induction and orientation, transfer, promotion, compensation, layoff and retrenchment, employee productivity. The overall objective here is to ascertain individual growth, development and effectiveness which indirectly contribute to organizational development. It also includes performance appraisal, developing new skills, disbursement of wages, incentives, allowances, traveling policies and procedures and other related courses of actions.
- **HRM in Employee Welfare:** This particular aspect of HRM deals with working conditions and amenities at workplace. This includes a wide array of responsibilities and services such as safety services, health services, welfare funds, social security and medical services. It also covers appointment of safety officers, making the

environment worth working, eliminating workplace hazards, support by top management, job safety, safeguarding machinery, cleanliness, proper ventilation and lighting, sanitation, medical care, sickness benefits, employment injury benefits, personal injury benefits, maternity benefits, unemployment benefits and family benefits.

It also relates to supervision, employee counseling, establishing harmonious relationships with employees, education and training. Employee welfare is about determining employees' real needs and fulfilling them with active participation of both management and employees. In addition to this, it also takes care of canteen facilities, crèches, rest and lunch rooms, housing, transport, medical assistance, education, health and safety, recreation facilities, etc.

- **HRM in Industrial Relations:** Since it is a highly sensitive area, it needs careful interactions with labor or employee unions, addressing their grievances and settling the disputes effectively in order to maintain peace and harmony in the organization. It is the art and science of understanding the employment (union-management) relations, joint consultation, disciplinary procedures, solving problems with mutual efforts, understanding human behavior and maintaining work relations, collective bargaining and settlement of disputes.

The main aim is to safeguarding the interest of employees by securing the highest level of understanding to the extent that does not leave a negative impact on organization. It is about establishing, growing and promoting industrial democracy to safeguard the interests of both employees and management.

The various HR processes are such as Human resource planning (Recruitment, Selecting, Hiring, Training, Induction, Orientation, Evaluation, Promotion and Layoff). ,Employee remuneration and Benefits Administration, Performance Management. , Employee Relations.

The key functions of the Human Resources Management (HRM) team include recruiting people, training them, performance appraisals, motivating employees as well as workplace communication, workplace safety, and much more. Recruitment and Training, Performance Appraisals, Maintaining Work Atmosphere, Managing Disputes, Developing Public Relations

The Human Resources Department also covers five key roles such as Executive role, Audit role, Facilitator role, Consultancy role, Service role.

CHALLENGES: With the ongoing changes in Human Resources Management (HRM), it's important that managers, executives and HR employees, specifically, be aware of the challenges that today's HRM team may face. While there are certainly other issues, these are common to most any type business or size of company and having policies in place to ensure these challenges are met head-on can make the workplace more settled and peaceful for everyone. The challenges which are faced by HR managers such as Workplace diversity,

Change management, Compensation and benefits, Recruiting skilled employees, Training and development. These are only a few of the many challenges an HR department must be prepared to deal with.

The steps in planning human resource in a library and information centre are:

- 1) Estimating personnel needs for the present and future, using techniques of forecasting which are available in the present era of the IT.
- 2) Establishing result oriented recruitment and selection procedure for new staff, inducting new staff to the organization, applying techniques that would be conducive to retain the best and ensure excellence in all aspects such as library automation, online systems, article indexing.
- 3) Progressive policies of personnel development to treat the staff with a respect and concern for their future by organizing training programme related to new technologies in Library Science.
- 4) Ensuring quality to products and services, keeping customer satisfaction as the primary objective i.e. the user satisfaction is the main aspect to get the related information to user in time.
- 5) Evaluating results at periodic intervals to improve efficiency and effectiveness which help in the quality service by Library.

Conclusion: In conclusion, the practice of HRM needs to be integrated with the overall strategy to ensure effective use of people and provide better returns to the organizations in terms of ROI (Return on Investment) for every rupee or dollar spent on them. Unless the HRM practice is designed in this way, the firms stand to lose from not utilizing people fully. And this does not bode well for the success of the organization. The times when management could arbitrarily dictate terms to the employees and tread upon their rights is something that is not relevant anymore. With the ballooning of the white collar workforce, it becomes necessary for organizations to pay more attention to the needs of the employees more than ever. It is clear from the above paragraphs that HRM denotes a shift in focus and strategy and is in tune with the needs of the modern organization. HRM concentrates on the planning, monitoring and control aspects of resources whereas Personnel Management was largely about mediating between the management and employees. Many experts view Personnel Management as being workforce centered whereas HRM is resource centered. In conclusion, the differences between these two terms have to be viewed through the prism of people management through the times and in context of the industry that is being studied.

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BIBLIOMETRIC ANALYSIS OF INDIAN JOURNAL OF CLINICAL BIO-CHEMISTRY FROM THE YEAR 2004-2013

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Abstract

This is a bibliometric analysis of 776 articles published in ten volumes of Indian journal of Clinical Bio-chemistry from volume 19(2004) to volume 28 (2013).The study has been carried out to observe the authorship pattern, year-wise/volume-wise distribution of contributions, distribution of keywords, length of papers, geographical distribution of contributions, Institution-wise contribution of articles and volume-wise/period-wise distribution of citations. The journal has started its publication from the year 1986 and is constantly being published since then. From the year 1986 to 1990 the journal has remained as a single issue publication and after 1991 to 2003 it has got two issues annually. Subsequently, from the year 2004 its growth of periodicity has reached to four issues a year and is now a quarterly publication. The present study reveals that there are 19496 citations, 32 issues, 776 contributions of ten volumes of the journal. Highest number of articles published is found in volume 23, in the year 2008 and there is a predominance of 5 and more authored contributions. Indian contribution has occupied top position 651(83.90) followed by foreign contributions with just 125(16.10%) only.

Key words: Bibliometrics, Bibliometric analysis of Indian Journal of Clinical Bio-Chemistry.

Introduction

Bibliometrics is a method of research used in the field of library and information science. It is a quantitative analysis of various aspects of literature used to identify the pattern of publication like authorship, length of papers, geographical distribution, & citations etc. used to know journal coverage to gain insight into the dynamics of growth of knowledge in the areas under consideration. This is very useful study for libraries for better organization of information resources in an effective and efficient way. Bibliometrics has many applications in identifying the research trends in subjects, core journals etc. These studies are very beneficial for libraries framing new subscription policies and collection development.

Pritchard (1969) is known as the founder of the term 'Bibliometrics' who defined the concept as, "the application of mathematical and statistical methods to books and other communication medium". Small's (2006) definition 'Bibliometrics' (2013) is, "a method for description, evaluation, and monitoring of research surrounding of a particular field or it can describe the quality and focus of research output by a particular organization". With the advent of Information and Communication Technology (ICT), faster web applications, and availability of online journals and databases, the field of Bibliometrics has gained momentum (Patra et al, 2006). Currently, bibliometric studies are conducted for a given field of knowledge on specific literature, research output of a prolific author, research productivity of an organization or of an individual journal for a specific period of time. The present study focuses on bibliometric analysis of Indian Journal of Clinical-Biochemistry comprising the year 2004-2013.

Review of literature

Swain, Dillip K, Swain, Chandrakanta & Rautaray, Bijayalaxmi.(2014) have analyzed the publication pattern of the journal Business Economics like the number of papers published, types of contributions, authorship pattern and ranking of authors. This study also identifies the core institutions having significant contributions to the journal. Maharana, Rabinder K, Das, Ashok Kumar & Choudhry, Bijay Kumar.(2014) in their study have examined the contents of papers published in the Defense Science Journal its average growth, authorship pattern, degree of collaboration, length of papers and distribution of citations. Narang, Asha & Sukhdev Singh. (2014) have carried out bibliometric analysis of 15786 citations appended to 1310 articles published in the Indian Journal of Pure & Applied Mathematics. The study includes the observation like distribution of contribution, authorship pattern, geographical distribution, citation analysis and the number of pages etc. Srimurugan, A & Nattar, S.(2013) have examined the articles published in online D-Lib Magazine for authorship trend, contribution of teaching and professional, country-wise contribution, degree of collaboration and productivity within various facets of digital/electronic libraries. Panday, Jay Prakash. (2013) analysis the papers presented in IATLIS Conferences in different ways to find out most productive author, state and organization etc. Keshava, Kusugal, N B. (2013) presents a bibliometric study of research trends in the field of nano-technology based on Web of Science. It deals with the growth of nano-technology literature, institutions contribution, productivity of top ten countries of the world, language and most productive authors. Tsay, Ming-Yueh. (2011) .This study explores the bibliometric characteristics of the journal of information science & the subject relationship with other disciplines by citation analysis.

Akhter, Hussain, Nishat, Fatima & Kumar, Devendra.(2011) have made a bibliometric study of papers published in the Electronic Library Journal covering year-wise distribution of articles, Category-wise classification of papers, subject-wise distribution of articles, authorship pattern & institution-wise distribution of contributions. Thanuskodi, S. (2011).This study makes an analysis of the papers published in Indian Journal of Chemistry from different angles i.e. authorship pattern, number of contributions, geographical distribution, length of articles and the number of documents cited. Warraich, Nosheen Fatima

(2011) have studied 11 issues of the journal of Library & Information Science on the basis of different parameters, viz author productivity, author collaboration, author institutional and geographical affiliation, language and length of papers, number of citations and the year-wise distribution of papers. Crawley-low, Jill. (2006) has used bibliometric technique to analyze the citation patterns of researches published in the American Journal of Veterinary Research(AJVR).Journal titles have been ranked in decreasing order of productivity to create a core list of journals most frequently used by veterinary medical researchers.

About the journal

The journal is an official publication of Association of Clinical Biochemists of India. It covers accreditation programmes pertaining to health and disease and acts as a bridge between disciplines in various areas of medicine. The journal is listed in: SCOPUS .Chemical Abstract Service (CAS), EMVASE, Expanded Academic, Google, INIS Atom Index, Ind Med, Index Copernicus, Indian Science Abstracts, MedInd, Chem. It is indexed / abstracted in PubMed (12 months embargo), PubMedCentral, SCOPUS, EMBASE, Chemical Abstracts Service (CAS), Google Scholar, Academic OneFile, Elsevier Biobase, Expanded Academic, Indian Science Abstracts, IndMed, INIS Atomindex, MedInd, OCLC, SCImago, Summon by ProQuest, Zoological Record. The journal has started publication from the year 1986 and is constantly being published as a peer reviewed publication since then.

Objectives

1. To ascertain the number of papers published in Indian Journal of Clinical-Biochemistry 2004 to 2013.
2. To find out the number of contributions published during the period of study
3. To examine the authorship pattern and collaboration trend of research in the journal.
4. To examine the authorship pattern of papers.
5. To carry out the study of key-words.
6. To study the distribution of key-words in the papers.
7. To identify institution-wise contribution of papers.
8. To study geographical distribution of contributions.
9. To determine the length of papers.
10. To identify the contributions with reference /without references.
11. To find out volume-wise and period-wise no. of citations.
12. To study the citation counts of all the published papers of the journal.

Methodology

In the present study the methodology applied is bibliometric analysis, used to study the bibliographic features of articles and citation analysis of references appended at the end of each article, published in the journal from 2004-2013.For this study the relevant data has been collected from volume 19(2004) to 28(2013).The data recorded has been tabulated and

analyzed for making observations regarding the progress and development of Indian journal of Clinical Bio-chemistry for the last ten years.

Data Analysis

❖ Year wise/Volume-wise Distribution

Table 1 reveals about the total number of papers published in ten volumes (Vol. 19-28) from the year 2004-2013 in the Indian journal of Clinical Bio-chemistry. This is study of 32 issues in which 776 articles have been published. As per the data given in the table below, the number of articles is high in the year 2008 (vol.24) having 90 articles (11.60%) published in it. The lowest number of articles i.e. 66 papers (8.51%) are found during the year 2007. The average publishing range in the journal is 78 and 79(10.5 -10.18%). From 2004-2007 the journal has only two issues published in a year. While as from 2008 on words it has increased from two to four issues a year.

Table 1. Year wise/Volume-wise Distribution of Articles

Year	Vol.No.	No. of Issues	No. of contributions	Percentage
2004	19	2	69	8.89
2005	20	2	79	10.18
2006	21	2	80	10.31
2007	22	2	66	8.51
2008	23	4	90	11.60
2009	24	4	78	10.05
2010	25	4	78	10.05
2011	26	4	79	10.18
2012	27	4	78	10.05
2013	28	4	79	10.18
Total		32	776	100

❖ Distribution of Articles

As observed from the table 2, the distribution of articles is very high in the first issue of the journal published in the month of January each year (i.e. 197 in total). The issue number 3 figures at the second position with a score of 188 contributions. After analyzing the data given in the table below the first two and last two issues during the year 2006 and 2007 have not been published at the regular interval of time. These issues are found to be delayed by one month from the actual time of their publication.

Table 2. Distribution of Articles (issue wise)

Year	Volume number	Issue-wise Contribution of Papers						Total
		January	March	April	July	September	October	
2004	19	31			38			69
2005	20	41			38			79
2006	21		42			38		80
2007	22		31			35		66
2008	23	25		21	23		21	90
2009	24	20		19	20		19	78
2010	25	20		21	15		22	78
2011	26	21		20	17		21	79
2012	27	18		19	20		21	78
2013	28	21		20	17		21	79
Total		197	73	120	188	73	125	776

❖ Authorship Pattern

The data related to authorship pattern is revealed in the table 3 showing maximum number of articles emanating from 5 and more authors with 242 (2.48%). The highest number of contributions at second position are the articles by 4 authors i.e. 169 (21.77%) while as the contributions by a single author have been found lowest just 62(7.99%) only.

Table 3. Authorship Pattern

Year	Number of Authors					Total
	1	2	3	4	5 & more	
2004	1	16	16	20	16	69
2005	4	18	18	22	17	79
2006	4	19	24	19	14	80
2007	7	10	19	10	20	66
2008	8	18	14	23	27	90
2009	5	11	12	20	30	78
2010	9	11	10	16	32	78
2011	8	9	18	13	31	79
2012	9	16	13	10	30	78
2013	7	7	14	16	35	79
Total	62 (7.99)	135 (17.40)	158 (20.36)	169 (21.77)	252 (32.48)	776 (100)

Note: Data in parentheses indicates percentage

❖ Degree of Collaboration

A study of degree of collaboration in an area of bibliometric studies, shows the tend in pattern of single and joint authorship in the Indian journal of clinical-biochemistry from 2004 to 2013, as shown in the table 4. The degree of collaboration ranges from 0.884 to 985. The average degree of collaboration is 0.921 during the period under study. The extent of collaboration in research can be computed with the help of Subramanyam's (1983) formula.

$$DC = \frac{NM}{NM+NS}$$

Where C = Degree of Collaboration

NM = Number of Multiple authors

NS = Number of Single authors

Table 4. Degree of Collaboration

Year	Single author paper(NS)	Multiple author paper (NM)	NM+NS	Degree of Collaboration(C)
2004	1	68	69	0.985
2005	4	75	79	0.949
2006	4	76	80	0.95
2007	7	59	66	0.893
2008	8	82	90	0.911
2009	5	73	78	0.935
2010	9	69	78	0.884
2011	8	71	79	0.898
2012	9	69	78	0.884
2013	7	68	79	0.985
Total	62 (7.98)	714 (92.02)	776(100)	0.920

Note: Date in parentheses indicates percentage

❖ Distribution of Key words

From the table 5 it is observed that there are 3209 key words attached to 776 papers with an average of 4.13 key words per paper. Volume 23 published in the year 2008 has the highest number of key words but due to more number of papers its average keywords per paper has gone down to 4.08 only. Therefore, volume 20 published in the year 2005 comes at first position as per the average number of keywords appended to each paper.

Table 5. Distribution of Key words.

Year	Volume	Rank	No. of papers	Total keywords	Average keywords per paper	Cumulative	
						keywords	%age
2004	19	9	69	275	3.98	275	8.57
2005	20	2	79	344	4.35	619	19.28
2006	21	8	80	304	3.80	923	28.77
2007	22	10	66	272	4.12	1195	37.23
2008	23	1	90	368	4.08	1563	48.71
2009	24	4	78	336	4.30	1899	59.17
2010	25	6	78	326	4.17	2225	69.34
2011	26	5	79	327	4.13	2552	79.52
2012	27	7	78	317	4.06	2869	89.40
2013	28	3	79	340	4.30	3209	100
Grand Total			776	3209	4.13	3209	100

❖ Institution-wise contribution of articles

Table 6 shows that majority of the articles 315 (40.60%) are contributed by the scholars from Colleges followed by 233 (30.2%) by Research Institutions and 219 (28.32%) from Universities at national and international level.

Table 6. Institution-wise contribution of articles

Name of the Institution	No. of Articles	Percentage
Universities	219	28.32
Colleges	315	40.60
Research Institutions	233	30.02
Miscellaneous	09	1.15
Total	776	100

❖ Geographical Distribution of Articles

Table 7 presents the data about rank-wise contributions from 26 states of India. The data reveals that Karnataka is the top contributor (95) followed by Maharashtra (90), Delhi (89), U. P (75), Tamil Nadu (52) and so on.

Table 7. Geographical Distribution of Articles (National)

S.No.	Name of the State	No. of Articles	Percentage	Rank
01.	Andhra Pradesh	41	5.29	6
02	Assam	05	0.64	16
03	Bihar	03	0.38	18
04.	Chandigarh	12	1.56	13
05.	Delhi	89	11.47	3
06.	Chhattisgarh	01	0.13	23
07	Gujarat	20	2.59	10
08.	Haryana	18	2.32	11
09.	Himachal Pradesh	02	0.26	21
10.	Jammu & Kashmir	03	0.38	19
11.	Karnataka	95	12.27	1
12.	Kerala	36	4.64	7
13.	Madhya Pradesh	12	1.56	14
14.	Maharashtra	90	11.61	2
15.	Manipur	02	0.26	22
16.	Meghalaya	01	0.13	24
17.	Nagaland	01	0.13	25
18.	Odisha	10	1.29	15
19.	Pondicherry	03	0.38	20
20.	Punjab	18	2.32	12
21.	Rajasthan	28	3.62	8
22.	Sikkim	04	0.51	17
23.	Tamil Nadu	52	6.73	5
24.	Uttar Pradesh	75	9.67	4
25.	Uttarakhand	01	0.13	26
26.	West Bengal	28	3.62	9
Total		651	83.89	

❖ Geographical Distribution of Articles (International)

Table 8 gives geographical distribution of 33 countries rank-wise and percentage wise. Out of the total 776 contributions, 651 have been made by Indian scholars. The rest of the contributions i.e.125 has been made by the scholars of other countries. The top contributor among the foreign countries is Iran (23) followed by Nigeria (18), and Egypt (15). This indicates that the researchers from these three countries have contributed more than that of other countries after India in the Indian Journal of Clinical Bio-Chemistry.

Table 8. Geographical Distribution of Articles (International)

S.No	Name of the Country	No. of Articles	Percentage	Rank e
01.	Australia	8	1.03	5
02.	Bolivia	1	0.13	19
03.	Belgaum	2	0.26	12
04.	Belgrade	1	0.13	20
05.	Bhutan	1	0.13	21
06.	China	5	0.64	6
07.	Columbia	1	0.13	22
08.	Denmark	1	0.13	23
09.	Egypt	15	1.93	3
10.	Ethiopia	1	0.13	24
11.	Ghana	2	0.26	13
12.	Iran	23	2.96	1
13.	Iraq	1	0.13	25
14.	Italy	1	0.13	26
15.	Nepal	2	0.26	14
16.	Malaysia	10	1.28	4
17.	Nigeria	18	2.31	2
18.	Pakistan	2	0.26	15
19.	Lebanon	1	0.13	27
20.	Japan	2	0.26	16
21.	Kenya	1	0.13	28
22.	Saudi Arabia	3	0.38	9
23.	Slovakia	2	0.26	17
24.	South Africa	1	0.13	29
25.	Sri Lanka	2	0.26	18
26.	Tanzania	1	0.13	30
27.	Turkey	4	0.51	7
28.	Thailand	3	0.38	10
29.	U.A.E	1	0.13	31
30.	U.K	3	0.38	1
31.	U.S.A	4	0.51	8
32.	Yugoslavia	1	0.13	32
33.	Yaounde	1	0.13	33
Total		125	16.10	

❖ Length of Articles

The table given below reveals volume-wise/year-wise length of papers published in different issues of Indian journal of Clinical Bio-chemistry. More than half of the papers are in

between 1-5 pages in length i.e. 485 (62.5%), followed by 264(34.02%) papers covered with 6-10 pages, 22(2.84 %) covered with 11-15 pages, 4(0.51%) covered with 16-20 pages and only 1(0.13%) covered with 20 & more than 20 pages.

Table 9.Length of Articles

Year	Volume	Pages					Total
		1-5	6-10	11-15	16-20	20 & more	
2004	19	52	15	2	0	0	69 (8.89)
2005	20	48	28	2	1	0	79 (10.18)
2006	21	54	25	1	0	0	80 (10.31)
2007	22	48	16	2	0	0	66 (8.51)
2008	23	73	15	1	0	1	90 (11.60)
2009	24	43	32	2	1	0	78 (10.05)
2010	25	40	35	2	1	0	78(10.05)
2011	26	48	28	2	1	0	79 (10.18)
2012	27	38	37	3	0	0	78(10.05)
2013	28	41	33	5	0	0	79 (10.18)
Total		485 (62.5)	264(34.02)	22(2.84)	4(0.51)	1(0.13)	100 (100)

❖ Articles with references/without references

It is observed from the below mentioned table that there are 761(98.06%) articles appended with references/citations. Papers published in the journal without citations/reference 15 (1.94%), are generally published in the form of editorials, book reviews and articles reviews etc.

Table 10. Articles with references/without references

Category	No. of references	Percentage
With references	761	98.06
Without references	15	1.94
Total	776	100

❖ Volume-wise Distribution of Citations

Table 11 indicates volume-wise distribution of citations 776 contributions of the journal having 19496 citations which means that every issue published 24 papers and each article has an average 25.13 citations. The table reveals that maximum numbers of citations have been

published (2202 in number) in volume 28, 2013. Hence volume 28 stood in the first position with maximum number of citations per paper. This is followed by vol.25, 23, 24 and so on.

Table 11. Volume-wise Distribution of Citations

Year	Vol.	Rank	No. of papers	No. of citation	Average no. of citations/paper	Cumulative	
						Citation	%age
2004	19	10	69	1575	22.82	1575	8.08
2005	20	8	79	1857	23.50	3432	17.61
2006	21	7	80	1859	23.23	5291	27.14
2007	22	9	66	1632	24.72	6923	35.50
2008	23	3	90	2099	26.91	9022	46.27
2009	24	4	78	2075	26.60	11097	56.92
2010	25	2	78	2173	27.85	13270	68.07
2011	26	6	79	1973	24.97	15243	78.18
2012	27	5	78	2051	26.29	17294	88.71
2013	28	1	79	2202	27.87	19496	100
Grand Total			776	19496	25.48	19496	100

❖ Period-wise Citation Range

Table 12 presents period-wise range of citations per paper with percentage. A total of 254 (32.74 %) articles top the list within the citation range between 21-30. This is followed by 241(31.05%) papers having in between 11-20 citations, 97(21.5%) in between 31-40 citations, and 88(11.35%) in between 1-10 citations respectively. A total of 15 (.94%) articles do not have citations.

Table 12. Period-wise Citation Range.

No. of citations	Period-wise citation range										Total
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
Nil	-	4	1	0	3	2	3	0	1	1	15 (1.94)
1-10	8	9	8	8	11	7	5	12	12	8	88 (11.34)
11-20	24	23	23	24	32	28	18	27	17	25	241 (31.05)
21-30	28	26	35	19	32	16	28	23	25	22	254 (32.73)
31-40	3	7	9	9	6	16	16	7	13	11	97 (12.5)
41-50	2	5	0	3	3	3	4	6	0	7	36 (8.12)
51-60	2	1	2	0	1	2	2	3	1	2	16 (2.06)
61-70	0	2	0	0	0	0	1	1	0	0	4 (0.51)
71-80	1	0	1	2	1	2	1	0	1	1	10 (1.29)
81-90	0	1	1	0	0	0	0	0	0	0	2 (0.26)
91 & above	1	1	0	1	1	2	1	2	2	2	13 (1.68)
Total	69 (8.9)	79 (10.18)	80 (10.31)	66 (8.51)	90 (11.60)	78 (10.05)	78 (10.05)	79 (10.18)	78 (10.05)	79 (10.18)	776 (100)

Note: Date in parentheses indicates percentage

Findings & Conclusion

- The journal is an official publication of the Association of Biochemists of India. It has started its publication from the year 1986 and is constantly being published since then.
- From the year 1986 to 1990 the journal has remained as single issue publication and after 1991 to 2003 it has got two issues annually. Subsequently, from the year 2004 its growth of periodicity has reached from two issues to four issues a year and is now a quarterly publication.
- The total number of contributions in the journal during the period of this study (i.e. from vol.19-28) is 776 and it has 32 issues.
- Volume 23 (2008) has maximum number of contributions 90 (11.60%) followed by volume 21 (2006) with (10.31%) and so on.
- There is pre-dominance of 5 & more authored contributions (21.77%) followed by 3 authored contributions (20.36%) respectively. Hence it indicates that the joint authorship has top position as compared to single authorship in the journal during the period of study.
- There are 3209 key words attached to 776 papers with an average of 4.13 key words per paper. It is observed that volume 23 published in the year 2008 has the highest numbers key words but due to more number of papers its average keywords per paper has gone down to 4.08 only. Therefore, volume 20 published in the year 2005 comes at first position as per the average number of keywords appended to each paper
- Institution-wise contribution is more from Colleges 315(40.60%) followed by research institutions 233(30.2%) and Universities 219(28.32%) both at national and international level respectively.
- Indian contribution has occupied top position 651(83.90) followed by foreign contributions with just 125(16.10%) only.
- The maximum number of papers published in ten volumes of the journal has the length of 1-5 pages (62.5%) followed by 6-10 pages (34.02%), 11-15 pages (2.04%) and so on.
- The number of articles with reference are 761 (98.06%).The other 15 (1.94%) articles published in the journal are generally in the shape of editorials, book reviews, case studies, short communications and article reviews etc.
- As per the volume-wise distribution of citations, there are 19496 citations appended to 776 papers published in the journal .Maximum number of citations have been found with 2202(20.87%) in volume 28 (2013) .The average number of citations per paper comes out to be 25.13%.
- The total of 254 (32.74%) articles top the list with in the citation range between 21-30.This is followed by 241(31.05%) articles in between 11-20 citations, 97(12.5%) in between 31-40 citations respectively.
- On the whole, the growth rate of the journal is showing upward trend in terms of periodicity, number of contribution, number of Indian contribution, number of pages

and the number of citations etc. The journal is of great interest to the people of Clinical-Biochemistry and related subjects. Furthermore, this study can also be beneficial to library and information science scholars in conducting the bibliometric research.

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OPEN ACCESS ONLINE JOURNALS ON MICROBIOLOGY ON DOAJ: A STUDY

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Abstract

The Directory of Open Access Journals (DOAJ) lists open access scientific and scholarly journals, that meet high quality standards by exercising peer-review or editorial quality control and are free to all from the time of publication based on the Budapest open access initiative. Total 48 free online journals were accessed through DOAJ and analyze based on country, language, subject headings, keywords, their accessibility and availability of archives of online journal in “Microbiology”. The data entered and analysed by SPSS. The study showed that India and Turkey were the prolific Country of E-journals on Microbiology on DOAJ. Also showed English is the most common Communication language to spread the knowledge in all over the world which is used by (27) E-journals on Microbiology on DOAJ.

Keyword: Open Access; Online Journals, E-Journals; Microbiology; DOAJ.

Introduction:

The proliferation of free accessible E-journal, the development of subject specific and E-print archives and collections of learning objects provides a very valuable supplement of scientific knowledge of the exiting types of published scientific information (book, Journals, databases etc.) However these valuable collections are difficult to overview and integrate in the library and information services provided by libraries for their user constituency. Open access E-journals as journal that use a funding model that does not charge readers or their institutions for access.

Open Access: “Availability to all”, “Open access to scientific and technological information”. (<http://en.wikipedia.org>).

Open access journals:

Open access journals are scholarly journals that are available online to the reader "without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself." Some are subsidized, and some require payment on behalf of the author. Open access means users have full control of access; read, download, distribute, print, search or link to the full texts of these articles. Open access journals are scholarly journals that are available online to the users "without financial, legal or technical barriers other than those inseparable from gaining access to the internet itself". Open access journals (sometimes called the "gold road to open accesses") are one of the two general methods for providing open access. The other one (sometimes called the "green road") is self archiving in a repository. The publisher of an open access journal is known as an "Open access publisher and the process; "open access publishing."

- Open Access Overview by Peter Suber
- The Budapest Open Access Initiative
- Bethesda Statement on Open Access Publishing
- Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities
- The Open Access Bibliography
- The Open Access Directory - a compendium of OA lists. (<http://en.wikipedia.org>)

How Open Is It? A guide by OASPA.:

The proliferation of free accessible online journal, the development of subject specific and E-print archives and collections of learning objects provides a very valuable supplement of scientific knowledge of the exiting types of published scientific information (book, Journals, databases etc.) However these valuable collections are difficult to overview and integrate in the library and information services provided by libraries for their user constituency. Open access journals as journal that use a funding model that does not charge readers or their institutions for access. (<http://doaj.org>)

Aims and Scope of DOAJ:

The aims of DOAJ are to increase the visibility and ease of use of open access scientific and scholarly journals thereby to promote increased usage and impact. The Directory seeks to be comprehensive, covering all open access scientific and scholarly journals that use a quality control system to guarantee the content. In short, the DOAJ aims to be the "one-stop shop" for users of open access journals. A journal included in the Directory must exercise peer-review or editorial quality control. Journals may report primary results of research or overviews of research results to a scholarly community. A serial must publish at regular intervals, generally more than once a year with each issue numbered or dated consecutively. A journal in DOAJ normally contains articles, stories, or other writings. (Linlin Z, 2014)

The scope of coverage offered by the Directory includes:

- All scientific and scholarly subjects.
- Scientific and scholarly periodicals that publish research or review papers in full text
- Publications from academic, government, commercial and non-profit private organizations.
- Publications that target primarily researchers and scholars
- Journals whose content is substantively re-search papers and available in full text
- All languages.

Microbiology:

Microbiology is the branch of science that deals with microorganisms. Microbiology (from Greek $\mu\bar{\iota}$ κρος, *mīkros*, "small"; βίος, *bios*, "life"; and -λογία, *-logia*) is the study of microscopic organisms, either unicellular (single cell), multicellular (cell colony), or acellular (lacking cells). Microbiology encompasses numerous sub-disciplines including virology, mycology, parasitology, and bacteriology (<http://en.wikipedia.org>).

Literature Review:

(Ratnakar, 2007) presents a brief overview of print journals, define OA movement, and explains the reason for existence in current scenario. According to him, OA movement also deals with promoting creation of institutional archives and usage of open source software and digitisation programme. He also highlighted the area of OA journals and open archives and present limitations of OAI movement.

(Ambhore & Khaparde, 2014) they studied "Open Access Online Journals on Genetics: A study in DOAJ" contains 57 journals analyzed based on country wise, Languages, subject Headings. It is observed that U.S. was in 1st rank in publishing 15 e-journals followed by U.K. also showed that English is the most common communication language for scientific community which is used by Online Journals on Genetics. Four e-journals on Generics also published simultaneously in English, French, Germany and Turkish languages.

Objectives of the paper:

1. To enumerate the free E-Journals on Microbiology on DOAJ.
2. To know the country wise distribution of E-journals on Microbiology on DOAJ.
3. To find out the language wise distribution of E-journals on Microbiology on DOAJ.
4. To know the Distributing Subject Headings of E- journals on Microbiology on DOAJ.
5. To know the Distributing Subject Keywords of E- journals on Microbiology on DOAJ.
6. To know the accessibility of archives of last five years of E- journals on Microbiology
7. To know the usefulness and applicability of Microbiology E-journals to other disciplines.

Research Methodology:

DOAJ (Directory of Open Access Journals) website (<http://www.doaj.org>) is browsed for the present paper Microbiology E-journals were searched out and 48 journals were found on DOAJ. Total 48 Microbiology E-journals were analyzed based on country wise, Languages, subject Headings, Subject Keywords and accessibility of Archives of E-journal.

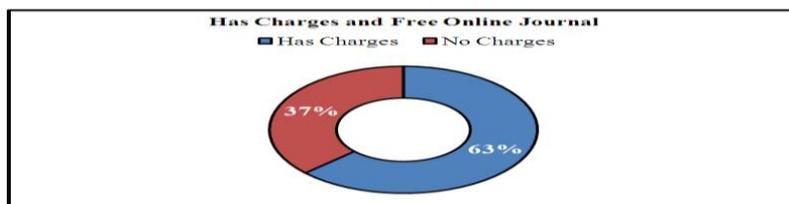
Limitation of the study:

The study is limited to Microbiology E-journals which is listed on Directory of Open Access Journals for the present paper DOAJ data is accessible till 03/09/2014. It is not possible to show all the online journals access so access of only one e-journal full text article is shown at last as a screen snapshot.

Analysis and Interpretations:

Total 48 Microbiology E-journals were analyzed based on Country wise, Language wise, Subject heading and accessibility of Archives of E-journals. Data entry and analysed by helping of SPSS and presented in the form of Tables and Charts.

Fig No. 1 Has Charges and Free Online Journals on Microbiology on DOAJ



Total 130 E-journals of Microbiology available on DOAJ. Has Charges 82 (63%) and Free 48 (37%).

Tables No. 1 List of Free E-Journals on Microbiology on DOAJ

Sr. No	Title of E-Journal	URL	ISSN No.	Publisher
			EISSN No.	
1	Acta Agriculturae Slovenica	http://aas.bf.uni-lj.si/index-en.htm	1581-9175, 1854-1941	University of Ljubljana
2	Acta Protozoologica	http://www.eko.uj.edu.pl/ap/index.php?option=com_frontpageandItemid=1	0065-1583, 1689-0027	Jagiellonian University
3	Acta Scientiarum : Biological Sciences	http://periodicos.uem.br/ojs/index.php/ActaSciBiolSci/index	1679-9283, 1807-863X	Eduem - Editora da Universidade Estadual de Maringa
4	Analele Stiintifice Ale Universitatii Alexandru Ioan Cuza	http://www.gbm.bio.uaic.ro/index.php/gbm	1582-3571	Alexandru Ioan Cuza University of Iasi

	din Iasi, Sectiunea II A : Genetica si Biol			
5	Annals : Food Science and Technology	http://www.afst.valahia.ro	2065-2828	Valahia University Press
6	Annals of Mechnikov's Institute	http://www.imiamn.org.ua/journal.htm	1993-4327	Annals of Mechnikov's Institute
7	Annals of Tropical Medicine and Public Health	http://www.atmph.org	1755-6783, 0974-6005	Medknow Publications
8	BIO Web of Conferences	http://www.bio-conferences.org	2117-4458	EDP Sciences
9	Biodiversity Science	http://www.biodiversity-science.net/EN/volumn/home.shtml	1005-0094	Science Press
10	Bistua : Revista de la Facultad de Ciencias Básicas	http://www.redalyc.org/revista.oa?id=903	0120-4211	Universidad de Pamplona
11	Botanical Studies	http://ejournal.sinica.edu.tw/bbas/	1817-406X	Academia Sinica
12	Brazilian Journal of Microbiology	http://www.scielo.br/bjm	1517-8382, 1678-4405	Sociedade Brasileira de Microbiologia
13	Cell Journal	http://celljournal.org/	2228-5806, 2228-5814	Royan Institute (ACECR), Tehran
14	Clinical Cancer Investigation Journal	http://www.cci-j-online.org	2278-1668, 2278-0513	Wolters Kluwer Health and Medknow Publications
15	Czech Journal of Food Sciences	http://www.agriculturejournals.cz/web/cjfs.htm	1212-1800, 1805-9317	Czech Academy of Agricultural Sciences
16	EurAsian Journal of Biosciences	http://www.ejobios.com/	1307-9867	Foundation for Environmental Protection and Research
17	Evolution Medicine and Public Health	http://emph.oxfordjournals.org/	2050-6201	Oxford University Press
18	Indian Journal of Pathology and Microbiology	http://www.ijpmonline.org/	0377-4929, 0974-5130	Medknow Publications
19	International Journal of Applied Biology and Pharmaceutical Technology	http://www.ijabpt.com	0976-4550	International Journal of Applied Biology and Pharmaceutical Technology
20	International Microbiology	http://www.im.microbios.org/	1139-6709, 1618-1905	Viguera Editores, S.L.
21	Iranian Biomedical Journal	http://ibj.pasteur.ac.ir/	1028-852X, 2008-823X	Pasteur Institute of Iran
22	Iranian Journal of Applied Animal Science	http://www.ijas.ir	2251-628X, 2251-631X	Islamic Azad University
23	Iranian Journal of Basic Medical Sciences	http://www.mums.ac.ir/basic_medical/en/index	2008-3866, 2008-3874	Mashhad University of Medical Sciences

24	ISRN Virology	http://www.hindawi.com/isrn/virology/	2090-8814	Hindawi Publishing Corporation
25	Japanese Journal of Medical Mycology	http://www.jsmm.org/magazine/magazine.html	0916-4804	Japanese Journal of Medical Mycology
26	Journal of Biomedical Research	http://www.jbr-pub.org	1674-8301	Editorial Department of Journal of Biomedical Research
27	Journal of Cell and Molecular Biology	http://jcmb.halic.edu.tr/	1303-3646, 1306-0961	Halic University
28	Journal of Culture Collections	http://www.bioline.org.br/cc	1310-8360	National Bank for Industrial Microorganisms and Cell Cultures Bulgaria
29	Journal of Global Infectious Diseases	http://www.jgid.org/	0974-777X, 0974-8245	Medknow Publications
30	Journal of Microbiology and Biology Education	http://jmbe.asm.org/index.php/jmbe	1935-7877, 1935-7885	American Society for Microbiology
31	Journal of Microbiology and Infectious Diseases	http://www.jmidonline.org/	2146-3158, 2146-9369	Association of Health Investigations
32	Journal of Microbiology, Biotechnology and Food Sciences	http://www.jmbfs.org	1338-5178	Slovak University of Agriculture
33	Journal of Phytology	http://journal-phytology.com/index	2075-6240	SILAE, Italy
34	Journal of the Faculty of Veterinary Medicine	http://vfdergi.yyu.edu.tr/	1017-8422, 1308-3651	Yuzuncu Yil University
35	Jundishapur Journal of Microbiology	http://jjmicrobiol.com/	2008-3645, 2008-4161	Ahvaz Jundishapur University of Medical Sciences
36	Jurnal Biologi el-Hayah	http://ejournal.uin-malang.ac.id/index.php/bio	2086-0064	UIN Press
37	Kasmera	http://revistas.luz.edu.ve/index.php/km	0075-5222	Universidad del Zulia
38	Klimik Journal	http://www.klimikdergisi.org/	1301-143X, 1309-1484	AVES Yayincilik
39	Memórias do Instituto Oswaldo Cruz	http://www.scielo.br/scielo.php?pid=0074-0276&script=sci_serial	0074-0276, 1678-8060	Instituto Oswaldo Cruz, Ministério da Saúde
40	Microbiology Research	http://www.pagepress.org/journals/index.php/mr	2036-7473, 2036-7481	PAGEPress Publications
41	Parasitología latinoamericana	http://www.scielo.cl/scielo.php?script=sci_serial&pid=0717-7712&lng=en&nrm=iso	0717-7704, 0717-7712	Sociedad Chilena de Parasitología
42	REMISE : Revue de Microbiologie Industrielle Sanitaire et Environnementale	http://www.remise.ma/	2028-0351	Université Mohammed Premier
43	Revista Argentina de	http://www.scielo.org.ar/scielo.php/scri	0325-7541,	Asociación Argentina

	Microbiología	pt_sci_serial/pid_0325-7541/Ing_en/nrm_iso	1851-7617	de Microbiología
44	Revista de Salud Animal	http://scielo.sld.cu/scielo.php?script=sci_serialandpid=0253-570Xandlng=esandnrm=iso	0253-570X, 2224-4700	Centro Nacional de Sanidad Agropecuaria
45	The Microbes	http://www.themicrobes.net	2321-3728	The Microbes
46	Tropical Life Sciences Research	http://www.tlsr.usm.my/	1985-3718, 2180-4249	Universiti Sains Malaysia Press
47	Türk Hijyen ve Deneysel Biyoloji Dergisi	http://www.turkhijyen.org/eng/jvi.aspx	0377-9777, 1308-2523	Refik Saydam Hifzissihha Merkezi Baskanligi
48	VacciMonitor	http://www.finlay.sld.cu/vaccimonitor.htm	1025-028X, 1025-0298	Finlay Ediciones

Table No. 1 Enumerate the free online journals on Microbiology along with their URL so that any user can browse the E-journals directly by entering the URL in its address bar.

Table: 2 Country wise Distribution of E-Journals on Microbiology

Sr. No.	Title of E-Journal	Place of Publication
1	Acta Agriculturae Slovenica	Slovenia
2	Acta Protozoologica	Poland
3	Acta Scientiarum : Biological Sciences	Brazil
4	Analele Stiintifice Ale Universitatii Alexandru Ioan Cuza din Iasi, Sectiunea II A : Genetica si Biologie Moleculara	Romania
5	Annals : Food Science & Technology	Romania
6	Annals of Mechnikov's Institute	Ukraine
7	Annals of Tropical Medicine & Public Health	India
8	BIO Web of Conferences	France
9	Biodiversity Science	China
10	Bistua : Revista de la Facultad de Ciencias Básicas	Colombia
11	Botanical Studies	Taiwan, Province of China
12	Brazilian Journal of Microbiology	Brazil
13	Cell Journal	Iran, Islamic Republic of
14	Clinical Cancer Investigation Journal	India
15	Czech Journal of Food Sciences	Czech Republic
16	EurAsian Journal of Biosciences	Turkey
17	Evolution Medicine & Public Health	United Kingdom
18	Indian Journal of Pathology & Microbiology	India
19	International Journal of Applied Biology & Pharmaceutical Technology	India
20	International Microbiology	Spain
21	Iranian Biomedical Journal	Iran, Islamic Republic of
22	Iranian Journal of Applied Animal Science	Iran, Islamic Republic of
23	Iranian Journal of Basic Medical Sciences	Iran, Islamic Republic of
24	ISRN Virology	Egypt
25	Japanese Journal of Medical Mycology	Japan
26	Journal of Biomedical Research	China
27	Journal of Cell & Molecular Biology	Turkey

28	Journal of Culture Collections	Bulgaria
29	Journal of Global Infectious Diseases	India
30	Journal of Microbiology & Biology Education	United States
31	Journal of Microbiology & Infectious Diseases	Turkey
32	Journal of Microbiology, Biotechnology & Food Sciences	Slovakia
33	Journal of Phytology	Italy
34	Journal of the Faculty of Veterinary Medicine	Turkey
35	Jundishapur Journal of Microbiology	Iran, Islamic Republic of
36	Jurnal Biologi el-Hayah	Indonesia
37	Kasmera	Venezuela, Bolivarian Republic
38	Klimik Journal	Turkey
39	Memórias do Instituto Oswaldo Cruz	Brazil
40	Microbiology Research	Italy
41	Parasitología latinoamericana	Chile
42	REMISE : Revue de Microbiologie Industrielle Sanitaire et Environnementale	Morocco
43	Revista Argentina de Microbiología	Argentina
44	Revista de Salud Animal	Cuba
45	The Microbes	India
46	Tropical Life Sciences Research	Malaysia
47	Türk Hijyen ve Deneysel Biyoloji Dergisi	Turkey
48	VacciMonitor	Cuba

Table No. 2 Enumerate the free online journals on Microbiology along with their Place of Publication.

Table No. 2.1 Analysis of Country wise Distribution of E-Journals on Microbiology

Sr. No.	Country	No. of E-Journals	Rank
1	India	6	1
2	Turkey	6	1
3	Islamic Republic of Iran	5	2
4	Brazil	3	3
5	China	2	4
6	Cuba	2	4
7	Italy	2	4
8	Romania	2	4
9	Argentina	1	5
10	Bulgaria	1	5
11	Chile	1	5
12	Colombia	1	5
13	Czech Republic	1	5
14	Egypt	1	5
15	France	1	5
16	Indonesia	1	5
17	Japan	1	5
18	Malaysia	1	5
19	Morocco	1	5
20	Poland	1	5
21	Slovakia	1	5

22	Slovenia	1	5
23	Spain	1	5
24	Taiwan, Province of China	1	5
25	Ukraine	1	5
26	United Kingdom	1	5
27	United States	1	5
28	Venezuela, Bolivarian Republic of	1	5
Total		48	/

Table No. 2.1 depicts the country wise distribution of E-journals on Microbiology on DOAJ. India & Turkey was in 1st rank due to publication of 6 e-journals followed by Iran, Islamic Republic of from United States followed by India and Iran, Islamic Republic of i.e. 5 E-journals.

Table No. 3 Language wise Distribution of E-Journals on Microbiology

Sr. No.	Title of the E- Journals	Language
1	Acta Agriculturae Slovenica	Slovenian, English
2	Acta Protozoologica	English
3	Acta Scientiarum : Biological Sciences	Portuguese, English
4	Analele Stiintifice Ale Universitatii Alexandru Ioan Cuza din Iasi, Sectiunea II A : Genetica si Biologie Moleculara	English, French
5	Annals : Food Science & Technology	English
6	Annals of Mechnikov's Institute	Ukrainian, Russian, English
7	Annals of Tropical Medicine & Public Health	English
8	BIO Web of Conferences	English
9	Biodiversity Science	Chinese, English
10	Bistua : Revista de la Facultad de Ciencias Básicas	Spanish, English
11	Botanical Studies	English
12	Brazilian Journal of Microbiology	English, Portuguese
13	Cell Journal	Persian, English
14	Clinical Cancer Investigation Journal	English
15	Czech Journal of Food Sciences	English
16	EurAsian Journal of Biosciences	English
17	Evolution Medicine & Public Health	Not available
18	Indian Journal of Pathology & Microbiology	English
19	International Journal of Applied Biology & Pharmaceutical Technology	English
20	International Microbiology	English
21	Iranian Biomedical Journal	English
22	Iranian Journal of Applied Animal Science	English
23	Iranian Journal of Basic Medical Sciences	English
24	ISRN Virology	English
25	Japanese Journal of Medical Mycology	English, Japanese
26	Journal of Biomedical Research	English
27	Journal of Cell & Molecular Biology	English
28	Journal of Culture Collections	English
29	Journal of Global Infectious Diseases	English
30	Journal of Microbiology & Biology Education	English

31	Journal of Microbiology & Infectious Diseases	English
32	Journal of Microbiology, Biotechnology & Food Sciences	English
33	Journal of Phytology	English
34	Journal of the Faculty of Veterinary Medicine	Turkish
35	Jundishapur Journal of Microbiology	English
36	Jurnal Biologi el-Hayah	Indonesian
37	Kasmera	Spanish, English
38	Klimik Journal	Turkish, English
39	Memórias do Instituto Oswaldo Cruz	English, Spanish, Portuguese
40	Microbiology Research	English
41	Parasitología latinoamericana	English, Spanish
42	REMISE : Revue de Microbiologie Industrielle Sanitaire et Environnementale	English
43	Revista Argentina de Microbiología	Spanish, English
44	Revista de Salud Animal	Spanish, English
45	The Microbes	English
46	Tropical Life Sciences Research	English, Bahasa Malaysia
47	Türk Hijyen ve Deneysel Biyoloji Dergisi	Turkish, English
48	VacciMonitor	Spanish

Table No. 3 Enumerate the free online journals on Microbiology along with their Languages of Publication.

Table No. 3.1 Analysis of Language wise Distribution of E-Journals on Microbiology

Sr. No.	Languages	No. of E journals	Rank
1	English	27	1
2	Spanish, English	4	2
3	Turkish, English	2	3
4	Chinese, English	1	4
5	English, Bahasa Malaysia	1	4
6	English, French	1	4
7	English, Japanese	1	4
8	English, Portuguese	1	4
9	English, Spanish	1	4
10	English, Spanish, Portuguese	1	4
11	Indonesian	1	4
12	NA	1	4
13	Persian, English	1	4
14	Portuguese, English	1	4
15	Slovenian, English	1	4
16	Spanish	1	4
17	Turkish	1	4
18	Ukrainian, Russian, English	1	4
Total		48	

Table No. 3.1 gives the information about the publication language of the E-journals on Microbiology. English (27) is the most common Communication language to spread the knowledge in all over the world. Out of 48 Microbiology e-journals is published in other Languages namely Spanish, Turkish, Chinese, French, Japanese, Portuguese, Indonesian, Persian, Slovenian, Ukrainian, & Russian.

Table No. 4 Distributions of Subject Headings of E-journals on Microbiology

Sr. No.	Title the E- Journals	Subject Headings
1	Acta Agriculturae Slovenica	Agriculture (General), Agriculture
2	Acta Protozoologica	Infectious & parasitic diseases, Internal medicine, Medicine, Microbiology, Science
3	Acta Scientiarum : Biological Sciences	Biology (General), Science
4	Analele Stiintifice Ale Universitatii Alexandru Ioan Cuza din Iasi, Sectiunea II A : Genetica si Biologie Moleculara	Genetics, Biology (General), Science
5	Annals : Food Science & Technology	Nutrition. Foods & food supply, Home economics, Technology
6	Annals of Mechnikov's Institute	Medicine (General), Medicine
7	Annals of Tropical Medicine & Public Health	Arctic medicine. Tropical medicine, Special situations & conditions, Internal medicine, Medicine
8	BIO Web of Conferences	Biology (General), Science
9	Biodiversity Science	Biology (General), Science
10	Bistua : Revista de la Facultad de Ciencias Básicas	Science (General), Science
11	Botanical Studies	Botany, Science
12	Brazilian Journal of Microbiology	Microbiology, Science
13	Cell Journal	Microbiology, Science
14	Clinical Cancer Investigation Journal	Neoplasms. Tumors. Oncology. Including cancer & carcinogens, Internal medicine, Medicine
15	Czech Journal of Food Sciences	Food processing & manufacture, Chemical technology, Technology, Agriculture (General), Agriculture
16	EurAsian Journal of Biosciences	Biology (General), Science
17	Evolution Medicine & Public Health	General Works
18	Indian Journal of Pathology & Microbiology	Pathology, Medicine, Microbiology, Science
19	International Journal of Applied Biology & Pharmaceutical Technology	Therapeutics. Pharmacology, Medicine
20	International Microbiology	Microbiology, Science
21	Iranian Biomedical Journal	Biology (General), Science, Medicine (General), Medicine
22	Iranian Journal of Applied Animal Science	Animal culture, Agriculture
23	Iranian Journal of Basic Medical Sciences	Medicine (General), Medicine
24	ISRN Virology	Medicine (General), Medicine
25	Japanese Journal of Medical Mycology	(General), Medicine, Microbiology, Science
26	Journal of Biomedical Research	Medicine (General), Medicine
27	Journal of Cell & Molecular Biology	Cytology, Biology (General), Science
28	Journal of Culture Collections	Microbiology, Science
29	Journal of Global Infectious Diseases	Infectious & parasitic diseases, Internal medicine,

		Medicine
30	Journal of Microbiology & Biology Education	Microbiology, Science
31	Journal of Microbiology & Infectious Diseases	Microbiology, Science, Infectious & parasitic diseases, Internal medicine, Medicine
32	Journal of Microbiology, Biotechnology & Food Sciences	Biotechnology, Chemical technology, Technology, Nutrition. Foods & food supply, Home
33	Journal of Phytology	Botany, Science
34	Journal of the Faculty of Veterinary Medicine	Veterinary medicine, Animal culture, Agriculture
35	Jundishapur Journal of Microbiology	Microbiology, Science
36	Jurnal Biologi el-Hayah	Biology (General), Science
37	Kasmera	Arctic medicine. Tropical medicine, Special situations & conditions, Internal medicine, Medicine,
38	Klimik Journal	Medicine (General), Medicine
39	Memórias do Instituto Oswaldo Cruz	Microbiology, Science, Arctic medicine. Tropical medicine, Special situations & conditions, Internal medicine, Medicine
40	Microbiology Research	Microbiology, Science
41	Parasitología latinoamericana	Microbiology, Science
42	REMISE : Revue de Microbiologie Industrielle Sanitaire et Environnementale	Microbiology, Science
43	Revista Argentina de Microbiología	Microbiology, Science
44	Revista de Salud Animal	Animal culture, Agriculture
45	The Microbes	Microbiology, Science
46	Tropical Life Sciences Research	Biology (General), Science
47	Türk Hijyen ve Deneysel Biyoloji Dergisi	Biology (General), Science, Public aspects of medicine, Medicine
48	VacciMonitor	Microbiology, Science, Therapeutics. Pharmacology, Medicine

Table No. 4 Enumerate the free online journals on Microbiology along with their Subject Heading of Publications.

Table No. 4.1 Analysis of Subject Headings of E-journals on Microbiology

Sr. No.	Subject Headings	No. of E-journal
1	Microbiology, Science	11
2	Biology (General), Science	6
3	Medicine (General), Medicine	5
4	Animal culture, Agriculture	2
5	Botany, Science	2
6	(General), Medicine, Microbiology, Science	1
7	Agriculture (General), Agriculture	1
8	Arctic medicine. Tropical medicine, Special situations & conditions, Internal medicine, Medicine	1
9	Arctic medicine. Tropical medicine, Special situations & conditions, Internal medicine, Medicine,	1
10	Biology (General), Science, Medicine (General), Medicine	1
11	Biology (General), Science, Public aspects of medicine, Medicine	1
12	Biotechnology, Chemical technology, Technology, Nutrition. Foods &	1

	food supply, Home	
13	Cytology, Biology (General), Science	1
14	Food processing & manufacture, Chemical technology, Technology, Agriculture (General), Agriculture	1
15	General Works	1
16	Genetics, Biology (General), Science	1
17	Infectious & parasitic diseases, Internal medicine, Medicine	1
18	Infectious & parasitic diseases, Internal medicine, Medicine, Microbiology, Science	1
19	Microbiology, Science, Arctic medicine. Tropical medicine, Special situations & conditions, Intern	1
20	Microbiology, Science, Infectious & parasitic diseases, Internal medicine, Medicine	1
21	Microbiology, Science, Therapeutics. Pharmacology, Medicine	1
22	Neoplasms. Tumors. Oncology. Including cancer & carcinogens, Internal medicine, Medicine	1
23	Nutrition. Foods & food supply, Home economics, Technology	1
24	Pathology, Medicine, Microbiology, Science	1
25	Science (General), Science	1
26	Therapeutics. Pharmacology, Medicine	1
27	Veterinary medicine, Animal culture, Agriculture	1
Total		48

Table No. 4.1 shows the interdisciplinary scope of the online-journals of Microbiology. They are multidisciplinary by nature. And also Microbiology E-journals can be used in Medicine, Animal culture, Agriculture, Botany and Science.

Table No. 5 Distributions of Subject Keywords of Online Journals on Microbiology

Sr. No.	Title of the E-journals	Subject Keywords
01	Acta Agriculturae Slovenica	nutrition, genetics, microbiology, economics, dairying, statistics, rural population, animal culture, plant , culture
02	Acta Protozoologica	protistology, cell biology, ecology, genetics, parasitology, physiology, photobiology, phylogeny, ultrastructure
03	Acta Scientiarum : Biological Sciences	botany, limnology, microbiology
04	Analele Stiintifice Ale Universitatii Alexandru Ioan Cuza din Iasi, Sectiunea II A : Genetica si Biologie Moleculara	molecular genetics, molecular biology, microbiology, animal physiology
05	Annals : Food Science & Technology	food engineering, food microbiology, biotechnology, agricultural sciences, environmental protection
06	Annals of Mechnikov's Institute	microbiology, immunology, epidemiology, pharmacology
07	Annals of Tropical Medicine & Public Health	tropical diseases, infectious diseases, public health, parasitology, microbiology, virology, immunology, epidemiology
08	BIO Web of Conferences	botany, zoology, genetics, microbiology, physiology
09	Biodiversity Science	conservation biology, botany, zoology, microbiology, ecology
10	Bistua : Revista de la Facultad de Ciencias Básicas	biology, chemistry, mathematics, geology, food, microbiology

11	Botanical Studies	molecular biology, ecology, biochemistry, physiology, microbiology, taxonomy
12	Brazilian Journal of Microbiology	biological sciences
13	Cell Journal	molecular science, cellular science, cell culture, HIV
14	Clinical Cancer Investigation Journal	oncology, microbiology
15	Czech Journal of Food Sciences	chemistry, biochemistry, microbiology, nutrition, food economy
16	EurAsian Journal of Biosciences	botany, ecology, microbiology
17	Evolution Medicine & Public Health	evolutionary biology, pathology, microbiology
18	Indian Journal of Pathology & Microbiology	morbid anatomy, surgical pathology, clinical pathology, diagnostic cytopathology, gynecologic cytology, aspiration cytology, hematology, immuno-hematology, medical microbiology
19	International Journal of Applied Biology & Pharmaceutical Technology	pharmaceutical technology, biology, microbiology, biochemistry
20	International Microbiology	microbiology, microorganisms, microbial biology, microbial applications
21	Iranian Biomedical Journal	biochemistry, genetics, immunology, cell biology, developmental biology, microbiology, molecular biology, pharmacology, physiology
22	Iranian Journal of Applied Animal Science	animal breeding, animal biotechnology, animal microbiology, sustainable livestock management
23	Iranian Journal of Basic Medical Sciences	medical sciences, anatomical sciences, biochemistry, genetics, immunology, microbiology
24	ISRN Virology	virus, microbiology
25	Japanese Journal of Medical Mycology	medical mycology, veterinary mycology
26	Journal of Biomedical Research	biochemistry, biophysics, genetics, immunology, microbiology, molecular biology
27	Journal of Cell & Molecular Biology	cell biology, molecular biology, genetics, microbiology, medicine, agriculture
28	Journal of Culture Collections	microorganisms, microbiology
29	Journal of Global Infectious Diseases	infectious diseases, public health, microbiology, bacteriology, virology, mycology, parasitology, clinical trials, clinical investigations
30	Journal of Microbiology & Biology Education	microbiology, biology education research, scholarly teaching, pedagogy
31	Journal of Microbiology & Infectious Diseases	microbiology, virology, parasitology, communicable diseases
32	Journal of Microbiology, Biotechnology & Food Sciences	chemical technology, biotechnology, food sciences, microbiology
33	Journal of Phytology	plant science research, microbiology, biology
34	Journal of the Faculty of Veterinary Medicine	animals, zoonosis, microbiology, alternative veterinary medicine
35	Jundishapur Journal of Microbiology	infectious diseases, bacteria, fungi, applied microbiology
36	Jurnal Biologi el-Hayah	biotechnology, medicine, botany, microbiology
37	Kasmera	tropical medicine, microbiology
38	Klimik Journal	clinical microbiology, infectious diseases
39	Memórias do Instituto Oswaldo Cruz	biological sciences, health sciences
40	Microbiology Research	molecular biology, cellular biology, virology, parasitology, mycology, bacteriology
41	Parasitología latinoamericana	biological sciences

42	REMISE : Revue de Microbiologie Industrielle Sanitaire et Environnementale	microbial ecology, applied microbiology, industrial microbiology
43	Revista Argentina de Microbiología	Microbiology
44	Revista de Salud Animal	veterinary medicine, molecular biology, microbiology
45	The Microbes	biotechnology, environmental sciences, life sciences
46	Tropical Life Sciences Research	life sciences, tropical biology, microbiology, biotechnology, tropical plants, environment
47	Türk Hijyen ve Deneysel Biyoloji Dergisi	microbiology, toxicology, biochemistry, food safety, environmental health, hygiene, public health
48	VacciMonitor	vaccines, vaccination, immunology, adjuvants, molecular biology, epidemiology

Table No. 5.1 Analysis Subject Keywords of Online Journals on Microbiology

Sr. No.	Subject Keywords	No. of E-journal
1	biological sciences	2
2	animal breeding, animal biotechnology, animal microbiology, sustainable livestock management	1
3	animals, zoonosis, microbiology, alternative veterinary medicine	1
4	biochemistry, biophysics, genetics, immunology, microbiology, molecular biology	1
5	biochemistry, genetics, immunology, cell biology, developmental biology, microbiology, molecular biology, pharmacology, physiology	1
6	biological sciences, health sciences	1
7	biology, chemistry, mathematics, geology, food, microbiology	1
8	biotechnology, environmental sciences, life sciences	1
9	biotechnology, medicine, botany, microbiology	1
10	botany, ecology, microbiology	1
11	botany, limnology, microbiology	1
12	botany, zoology, genetics, microbiology, physiology	1
13	cell biology, molecular biology, genetics, microbiology, medicine, agriculture	1
14	chemical technology, biotechnology, food sciences, microbiology	1
15	chemistry, biochemistry, microbiology, nutrition, food economy	1
16	clinical microbiology, infectious diseases	1
17	conservation biology, botany, zoology, microbiology, ecology	1
18	evolutionary biology, pathology, microbiology	1
19	food engineering, food microbiology, biotechnology, agricultural sciences, environmental protection	1
20	infectious diseases, bacteria, fungi, applied microbiology	1
21	infectious diseases, public health, microbiology, bacteriology, virology, mycology, parasitology, clinical trials, clinical investigations	1
22	life sciences, tropical biology, microbiology, biotechnology, tropical plants, environment	1
23	medical mycology, veterinary mycology	1
24	medical sciences, anatomical sciences, biochemistry, genetics, immunology, microbiology	1
25	microbial ecology, applied microbiology, industrial microbiology	1
26	Microbiology	1
27	microbiology, biology education research, scholarly teaching, pedagogy	1
28	microbiology, immunology, epidemiology, pharmacology	1
29	microbiology, microorganisms, microbial biology, microbial applications	1

30	microbiology, toxicology, biochemistry, food safety, environmental health, hygiene, public health	1
31	microbiology, virology, parasitology, communicable diseases	1
32	microorganisms, microbiology	1
33	molecular biology, cellular biology, virology, parasitology, mycology, bacteriology	1
34	molecular biology, ecology, biochemistry, physiology, microbiology, taxonomy	1
35	molecular genetics, molecular biology, microbiology, animal physiology	1
36	molecular science, cellular science, cell culture, HIV	1
37	morbidity anatomy, surgical pathology, clinical pathology, diagnostic cytopathology, gynecologic cytology, aspiration cytology, hematology, immuno-hematology, medical microbiology	1
38	nutrition, genetics, microbiology, economics, dairying, statistics, rural population, animal culture, plant, culture	1
39	oncology, microbiology	1
40	pharmaceutical technology, biology, microbiology, biochemistry	1
41	plant science research, microbiology, biology	1
42	protistology, cell biology, ecology, genetics, parasitology, physiology, photobiology, phylogeny, ultrastructure	1
43	tropical diseases, infectious diseases, public health, parasitology, microbiology, virology, immunology, epidemiology	1
44	tropical medicine, microbiology	1
45	vaccines, vaccination, immunology, adjuvants, molecular biology, epidemiology	1
46	veterinary medicine, molecular biology, microbiology	1
47	virus, microbiology	1
Total		48

Table No. 5 and No.5.1 intended to make for searching accordingly to Subject Keywords in online Journals on Microbiology. Table indicates the useful keywords for searching in each online journal on Microbiology so that user would not waste their time by browsing broad Keywords.

Table No. 6 Accessibility of archives of E-journals on Microbiology

No	Title of E-journal	2014	2013	2012	2011	2010
1	Acta Agriculturae Slovenica	V 103 (1)	NA	NA	NA	-
2	Acta Protozoologica	V 53 (1-3)	V 52 (1-4)	V 51 (1-4)	V 50 (1)	-
3	Acta Scientiarum: Biological Sciences	V 36 (3)	-	-	-	-
4	Analele Stiintifice Ale Universitatii Alexandru Ioan Cuza din Iasi, Sectiunea II A: Genetica si Biologie Moleculare	-	-	-	-	-
5	Annals: Food Science & Technology	V 15 (1)	V 14 (1-2)	V 13 (1-2)	V 12 (1-2)	V 11 (1-2)
6	Annals of Mechnikov's Institute	V 2014 (1)	V 2013 (1-4)	V 2012 (1-4)	V 2011 (1-4)	V 2010 (1-4)
7	Annals of Tropical Medicine & Public Health	-	V 6 (1-6)	V 5 (1-6)	V 6 (1-2)	V 6 (1-2)
8	BIO Web of Conferences	V 2 (1-2)	V 1 (1)	-	-	-
9	Biodiversity Science	V 22 (1-3)	V 21 (1-6)	V 20 (1-6)	V 19 (1-6)	V 18 (1-6)

10	Bistua: Revista de la Facultad de Ciencias Básicas	-	-	V 10 (1-2)	V 9 (1-2)	V 8 (1-2)
11	Botanical Studies	V 55 (1-4)	V 54 (1-4)	V 53 (1-4)	V 52 (1-4)	V 51 (1-4)
12	Brazilian Journal of Microbiology	V 45 (1)	V 44 (1-4)	V 43 (1-4)	V 42 (1-4)	V 41 (1-4)
13	Cell Journal	V 16 (1-3)	V 15-14 (1-5)	V 14-13 (1-5)	V 13-12 (1-7)	V 11-10 (1-5)
14	Clinical Cancer Investigation Journal	V 3 (1-5)	V 2 (1-4)	V 1 (1-4)	-	-
15	Czech Journal of Food Sciences	V 32 (1-4)	V 31 (1-6)	V 30 (1-6)	V 29 (1-7)	V 28 (1-6)
16	EurAsian Journal of Biosciences	-	V 1 (1-7)	-	-	-
17	Evolution Medicine & Public Health	V 2014 (1)	V 2013 (1)	-	-	-
18	Indian Journal of Pathology & Microbiology	V 57 (1-3)	V.56 (1-4)	V.55 (1-4)	V.54 (1-4)	V.53 (1-4)
19	International Journal of Applied Biology & Pharmaceutical Technology	V 5 (1-3)	V 4 (1-3)	V 3 (1-3)	V 2 (1-3)	V 1 (1-3)
20	International Microbiology	V 17 (1)	V 16 (1-4)	V 15 (1-3)	V 14 (1-4)	V 13 (1-3)
21	Iranian Biomedical Journal	V 18 (1-4)	V 17 (1-4)	V 16 (1-4)	V 15 (1-4)	V 14 (1-4)
22	Iranian Journal of Applied Animal Science	V 4 (1-4)	V 3 (1-4)	V 2 (1-4)	V 1 (1-4)	NA
23	Iranian Journal of Basic Medical Sciences	-	-	-	V 12 (48-50)	V 13 (45-47)
24	ISRN Virology	-	-	-	-	-
25	Japanese Journal of Medical Mycology	V 55 (1-2)	V 54 (1-4)	V 53 (1-4)	V 52 (1-4)	V 51 (1-4)
26	Journal of Biomedical Research	V 2014 (1-4)	V 2013 (1-6)	V 2012 (1-6)	V 2011 (1-6)	V 2010 (1-6)
27	Journal of Cell & Molecular Biology	-	-	V 10 (1-2)	V 9 (1-2)	V 8 (1-2)
28	Journal of Culture Collections	-	-	-	-	-
29	Journal of Global Infectious Diseases	V 6 (1-3)	V 5 (1-4)	V 4 (1-4)	V 3 (1-4)	V 3 (1-3)
30	Journal of Microbiology & Biology Education	V 8 (1)	V 7 (1-4)	V 6 (1-4)	V 5 (1-4)	V 4 (1-3)
31	Journal of Microbiology & Infectious Diseases	V 4 (1)	V 3 (1-4)	V 2 (1-4)	V 1 (1-3)	-
32	Journal of Microbiology, Biotechnology & Food Sciences	V 4 (1)	V 3 (1-6)	V 2 (1-2)	V 1 (1-6)	-
33	Journal of Phytology	-	-	-	-	-
34	Journal of the Faculty of Veterinary Medicine	V 25 (1-3)	V 24 (1-3)	V 23 (1-3)	V 22 (1-3)	V 21 (1-3)
35	Jundishapur Journal of Microbiology	V 7 (1-9)	V 6 (1-10)	V 5 (1-4)	V 4 (1-5)	V 3 (1-4)
36	Jurnal Biologi el-Hayah	-	-	V 2-3 (1-2)	V 1 (4)	V 1 (2)
37	Kamera	-	-	-	-	-
38	Klimik Journal	-	V 26 (1-2)	V 25 (1-3)	V 24 (1-3)	V 23 (1-3)
39	Memórias do Instituto Oswaldo Cruz	V 109 (1-5)	V 108 (1-8)	V 107 (1-8)	V 106 (1-8)	V 105 (1-8)

40	Microbiology Research	V 5 (1)	V 4 (1)	V 3 (1-2)	V 2 (1-2)	V 1 (1)
41	Parasitología latinoamericana	V 63 (1-4)	V 62 (1-4)	V 61 (1-4)	V 60 (1-4)	V 59 (1-4)
42	REMISE : Revue de Microbiologie Industrielle Sanitaire et Environnementale	V 8 (1)	V 7 (1-2)	V 7 (1-2)	V 6 (1-2)	V 6 (1-2)
43	Revista Argentina de Microbiología	V 46 (1-2)	V 45 (1-4)	V 44 (1-4)	V 43 (1-4)	V 42 (1-4)
44	Revista de Salud Animal	V 36 (1-2)	V 35 (1-3)	V 34 (1-3)	V 33 (1-3)	V 32 (1-3)
45	The Microbes	-	-	-	-	-
46	Tropical Life Sciences Research	V 24 (1-2)	V 23 (1-2)	V 22 (1-2)	V 21 (1-2)	V 20 (1-2)
47	Türk Hijyen ve Deneysel Biyoloji Dergisi	V 71 (1-2)	V 70 (1-4)	V 69 (1-4)	V 68 (1-5)	V 67 (1-4)
48	VacciMonitor	V 23 (1-2)	V 22 (1-3)	-	V 20 (1-4)	-

Findings:

1. It is observed that India & Turkey was in 1st rank due to publication of 6 e-journals followed by Islamic Republic of Iran of i.e. 5 E-journals.
2. English is the most common Communication language to spread the knowledge in all over the world which is used by (27) on microbiology.
3. Microbiology e-journals are interdisciplinary by Nature. So Microbiology e-journals can also be useful for Biochemistry Botany, Science, Medicine

Conclusion:

In the present study, we have systematically selected and examined all 48 e-journals of Microbiology on DOAJ; analyzed based on Country, Language, Subject heading and accessibility of Archives. DOAJ is comprehensive and covers open access scientific and scholarly journals that use an appropriate quality control system, and it will not be limited to particular languages or subject areas. DOAJ is to increase the visibility and ease of use of open access scientific and scholarly journals there by promoter their increased usage and impact. Research scholars, scientists, Professionals should browse the DOAJ site and access the free online journals on their subject areas It is also suggested that scientists and Research scholars should publish their research work in online open access journals for wider visibility of their research work and for greater impact factor and citation index.

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APPLICATION OF CLOUD BASED KNOWLEDGE THROUGH KNIMBUS FOR STAKEHOLDERS OF ENGINEERING LIBRARIES IN BANGALORE - A CASE STUDY

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Abstract

In the present era there is a constant transition from the traditional libraries - print media to the digital resources through the web based digital library. With the advent of latest technology, the engineering libraries has been developed and well equipped with the maximum usage of technological resources to disseminate the web based knowledge to its stakeholders. The present day stakeholders namely, students, faculties, research scholars are in a great need of information at the least possible time, this is the area where the information professionals and the scholarly publishing developers play a vital role in providing the required information under one cloud platform where the stakeholders can connect and collaborate with the other peer groups. This paper is a case study on cloud based knowledge through Knimbus platform for stakeholders of engineering libraries in Bangalore. Cloud based services refers to both application delivered as a service on internet and system software in the data centers that provide services. The scope of the study covers how cloud based knowledge through Knimbus for its stakeholders can be availed at their workstations. This paper highlights and facilitates the various e- resources being subscribed by the institutions and used by the stakeholders through Knimbus platform effectively. Knimbus application model is based on SaaS model which enables the users to explore, exchange ideas, share and create content in a innovate manner. This helps as a value added service to all its users.

Keywords: Web Based Service, Cloud Service, Knimbus Service, SaaS Model, Library Service, Engineering Libraries.

1. INTRODUCTION

The present day information is very vast and informative which need to reach all the information seekers in a effective manner, the library professionals plays a vital role in helping and updating the stakeholders get the information in the shortest given time. To satisfy the present studies on application of cloud based knowledge through Knimbus for stakeholders of engineering libraries in Bangalore city was conducted. This paper is a case study which highlights and facilitates various e-resources being subscribed by the institution and used by the stakeholders through Knimbus.

2. REVIEW OF LITERATURE

A L Moorthy; Ankurpant¹, in the paper highlights about the resource sharing amongst libraries that has aimed in overcoming various budgetary constraints. The author¹, has done an analytical study about the DRDO e- journals consortium, its issues and concerns related to library consortia that are made available from across the globe. Each subject has its own core journals providing high quality research information. The author¹, also highlights about the challenging task which involves many issues to be resolved. Further the author¹, concludes that the DRDO e- journals consortium has strengthened the resource sharing and proved 24/7 availability of information.

In the paper the author, Anna Kaushik; Ashok Kumar², speaks about the cloud computing technology for the libraries, how these services are offering libraries to connect to various through cloud. The author², also highlights on identifying and generating cloud based services for libraries, further the cloud computing models highlights on how the libraries are providing effective services to its readers. With regard to this the author², concludes that libraries should enhance their services through cloud for giving better enhanced services to its stakeholders.

In the paper cloud computing and its applications in library services the author³, speaks about the usage of cloud computing through internet for all its computing activities as per its requirement. These applications are available to a wide group of users across the globe. The author³, highlights about the scholarly contents in searching through Knimbus. Knimbus is a knowledge cloud which is dedicated to knowledge discovery and collaborative space for researchers and scholars. The author³, also highlights about the benefits and limitations of cloud computing in terms of cost effectiveness, security, ease to backup, recovery and unlimited storage capacity, which helps in disseminating the information from one point to all its readers, further the author Subhash Chand; Nishi Singh³, concludes that the cloud services can be customized and flexible use for providing information to the readers.

The author⁴, in their paper online collaborative research platform: a tool to scholars with a special study on research scholars of Gauhati University, speaks about the availability of modern research methods which are now accessible in open access cloud based system through online networks models. The author⁴, in his paper, studies about the effectiveness of the use of collaborative research tool which is rapid moving in the present research era. The author⁴, has used survey research techniques for the study. Further the author⁴, highlights the collaborative research and Knimbus, which is a single search access window that connects users to more than a billion items of content which can be searched in real time basis. The author Dipankar Borah; Mondita Borah⁴, concludes that the libraries need to motivate its information seekers and researchers in getting the right information at a faster pace.

This paper focuses on functions of federated search engine it also describes how libraries can integrate their multi lingual databases in federated search platform. The author Miteshkumar Pandya⁵, speaks about the major service provider like deep web technologies, Knimbus,

metalib from Exlibris, 360 search from serial solution which focused on its short comings like the need for technical staff to solve problems while facing difficulties in retrieving the results from various databases. Further in this paper it is discussed about the OPAC versus Federated search engine, where almost all the libraries are indexing their books, journals and non book materials in OPAC, here the author⁵, also highlights the difficulties where multiple databases which were not stored in a library server. In view of this the IT providers have developed federated search engine to overcome with this problem. The author Mitesh kumar Pandya⁵, concludes that any libraries willing in implementing any federated search engine one need to ask for a trial price for different packages which varies for one to one service provider.

3. OBJECTIVES

1. To identify the awareness of readers using Knimbus platform.
2. To study the competent level of using Knimbus for accessing e-resources.
3. To study various functionality in using Knimbus for accessing e –resources.
4. To identify the most preferred format of downloading the e –resources.
5. To check the satisfaction level of using Knimbus as a platform for various journals.

4. SCOPE

The study is confined to the colleges covered under Visvesvaraya Technological University (VTU), there are 201 affiliated engineering colleges under its jurisdiction. Twenty colleges in Bangalore City are covered for the present study regarding the application of cloud based knowledge through Knimbus for stakeholders in engineering library.

5. METHODS USED

Questionnaire consisting of 10 questions were designed to the gather the opinion of the stakeholder. Data was collected which was further enhanced by informal discussion by the stakeholders. The discussions are further presented in the consequent sections in form of percentage and graphical exhibits.

6. DATA INTERPRETATION

Table 6.1 Age of the Respondents

Age	No. of Respondent	Responded	Percentage
21-30	500	200	10
31 - 40	500	150	20
41- 50	500	100	40
51 -60	500	30	20
61 and Above	500	20	10
Total		500	100

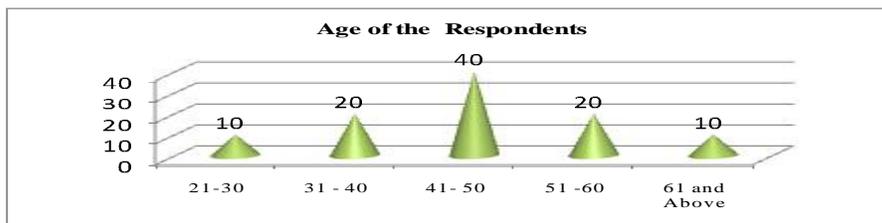


Figure 6.1 Age of the Respondents in Percentage Form

The above figure 6.1 represents 40% of the respondents were in the age group between 41-50, which is clear that there is a high usage of accessing electronic through Knimbus followed by the age group of 31-40 and 51-60 with 20% of usage.

Table 6. 2 Awareness of Accessing Electronic Resources through Knimbus

Awareness	No. of Respondent	Responded	Percentage
Yes	500	350	70
No	500	150	30
Total		500	100

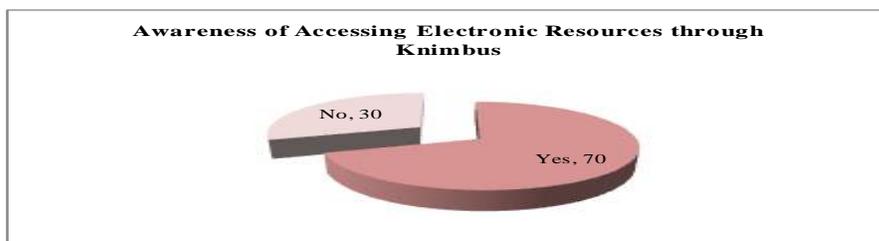


Figure 6. 2 Awareness of Accessing Electronic Resources through Knimbus

Figure 6.2 indicates about the awareness of accessing electronic resources through Knimbus where 70% of respondents have responded for an effective usage and have spoken about its benefits in the face to face interview.30% were not aware reasons were due to lack of computer awareness and from rural background, these stakeholders were given special training in various engineering institutions.

Table 6.3 Benefits through Knimbus for Journal Finder

Benefits	No. of Respondent	Responded	Percentage
Very Useful	500	250	50
Useful	500	200	40
Does not Help	500	50	10
Total		500	100

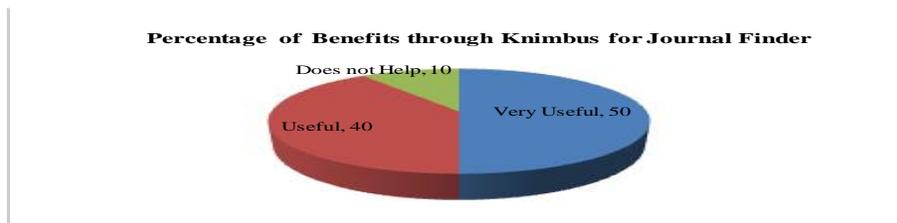


Figure 6.3 Percentage of Benefits through Knimbus for Journal Finder

The above figure 6.3 represents on the benefits of using Knimbus for journal finder indicates 50% of the stakeholder’s responded very useful for accessing the electronic resources as these were available under one single platform, the remaining 40% has responded useful and 10% has responded does not help, for which the library professionals are working out to convert these 10% into maximum usage by providing hands on training.

Table 6.4 Acquired Skills of Accessing Knimbus for Electronic Resources

Acquired Skills	No. of Respondent	Responded	Percentage
Library Personnel	500	100	20
Trainer	500	100	20
Self Study	500	100	20
Colleagues	500	150	30
Observation	500	50	10
Total		500	100



Figure 6.4 Percentage of Skills Acquired From

30% of the respondents have responded skills acquired from the colleagues for accessing electronic resources through Knimbus, followed by 20% acquired skills from library personnel, trainers, self study.

Table 6.5 Place of Accessing the Knimbus for E Resources

Place of Accessing	No. of Respondent	Responded	Percentage
Library	500	350	70
College Campus	500	100	20
Cafeteria	500	50	10
Total		500	100

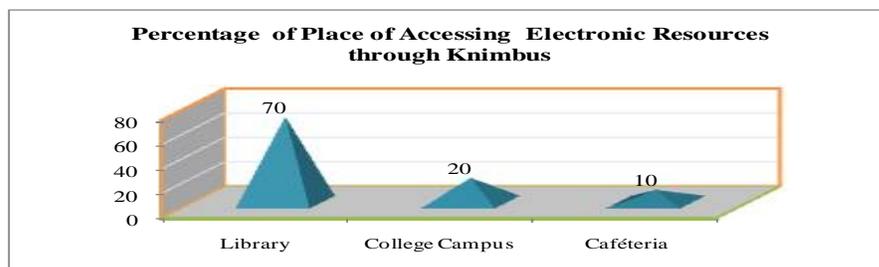


Figure 6.5 Percentage of Place of Accessing Electronic Resources through Knimbus

It is clearly seen in the above figure 6.5 that there is around 70% of the stakeholder’s are accessing electronic resources through Knimbus from library, which is evident that the library is been utilized at the fullest extent. This is followed by the access in college campus that is through the wi-fi mainly by the hostel students and other stakeholders using a laptop.

Table 6.6 Frequency of Using Knimbus for Accessing E- Resources

Frequency	No. of Respondent	Responded	Percentage
Daily	500	305	61
Weekly	500	45	09
Monthly	500	50	10
When Requirement Arises	500	75	15
Any Other Source	500	25	05
Total		500	100

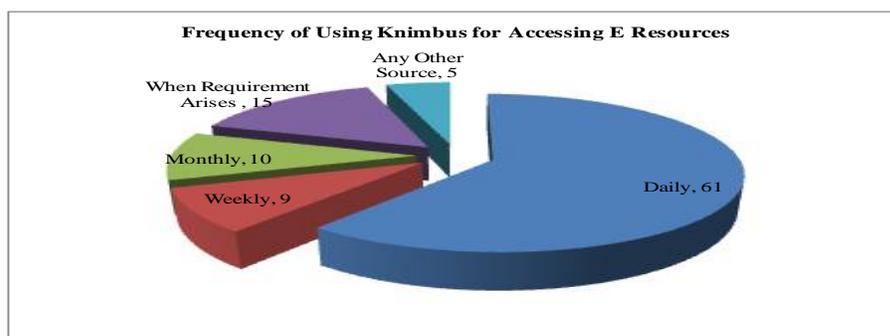


Figure 6.6 Frequency of using Knimbus for Accessing E- Resources

There is a constant usage of Knimbus for accessing E Resources for various purposes namely for class, seminar presentation, for journal article etc which indicates around 61 % as seen in the figure 6.6 The frequency is more the reason being all the journals can be found on one

single platform, the stakeholders need not browse through various weblink to get access for journals. The least among them is the any other source which is around 5%.

Table 6.7 Preferred Formats for Downloading E-Resource through Knimbus

Preferred Format	No. of Respondent	Responded	Percentage
pdf	500	352	70.4
HTML	500	95	19
Word	500	53	10.6
Total		500	100

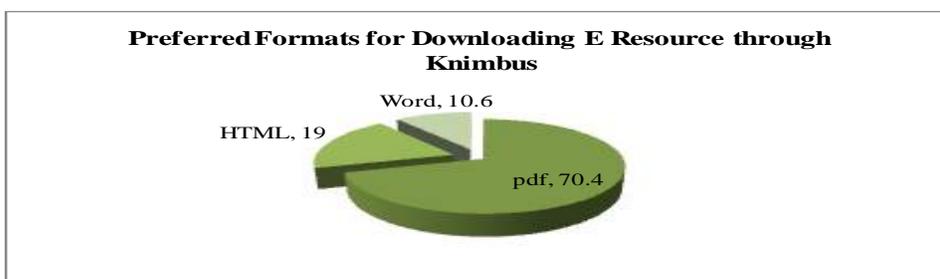


Figure 6.7 Preferred Formats for Downloading E- Resource through Knimbus

Figure 6.7 indicates 70.4% of the stakeholders prefer the pdf format for downloading the e resources through Knimbus, followed by HTML with 19% and word 10.6%. Pdf being more convenient and easy to download and store stakeholders prefer the same.

Table 6.8 Problems Faced while using Knimbus for E- Resources

Problems	No. of Respondent	Responded	Percentage
Slow Internet Speed	500	150	30
Difficulty in Retrieving Information	500	75	15
Frequent interruption in Internet Connection	500	150	30
Firewalls	500	50	10
Long time taken to Download Information	500	75	15
Total		500	100

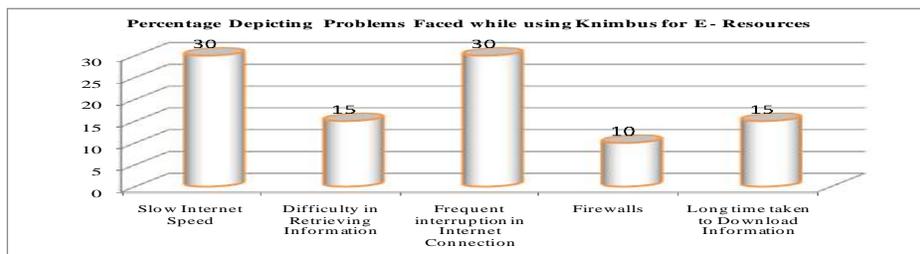


Figure 6.8 Percentage Depicting Problems Faced while using Knimbus for E- Resources

The above figure 6.8 depicts the problems faced while using Knimbus for accessing E Resources which has two reasons with the same percentage that is 30 % which says slow internet speed and frequent interruption in internet connection being the major problem faced while the remaining 15% that of difficulty in retrieving the information and long time taken to download the information.

Table 6.9 Frequently Downloading E- Resource through Knimbus

Downloading E Resource	No. of Respondent	Responded	Percentage
IEEE/ IEL	500	100	20
ASCE	500	30	06
Proquest	500	50	10
Science Direct	500	75	15
Springer Link	500	50	10
Taylor and Francis	500	50	10
CRC Net E Books	500	40	08
IET Digital Library	500	55	11
EBSCO	500	50	10
Total		500	100

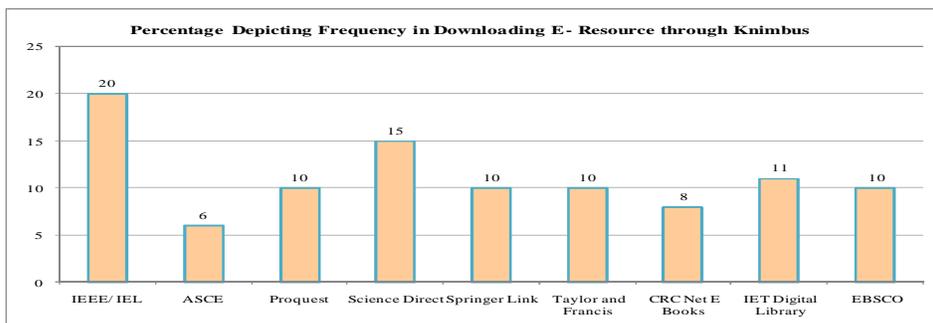


Figure 6.9 Percentage Depicting Frequency in Downloading E- Resource through Knimbus

Percentage depicting frequency in downloading E- Resources through Knimbus in figure 6.9 indicates that there is a higher usage of IEEE journal download by the stakeholders and next in the line is the usage of Elsevier science (Science Direct) with 15% followed by the other

resources with 11% and 10% that is IET, Proquest, Springer Link, and EBSCO. It is also clear that there is a good use of the e resources.

Table 6.10 Level of Satisfaction in using Knimbus for Accessing E- Resources

Satisfaction	No. of Respondent	Responded	Percentage
Great Extend	500	350	70
Some Extend	500	100	20
Least Extend	500	50	10
Total		500	100

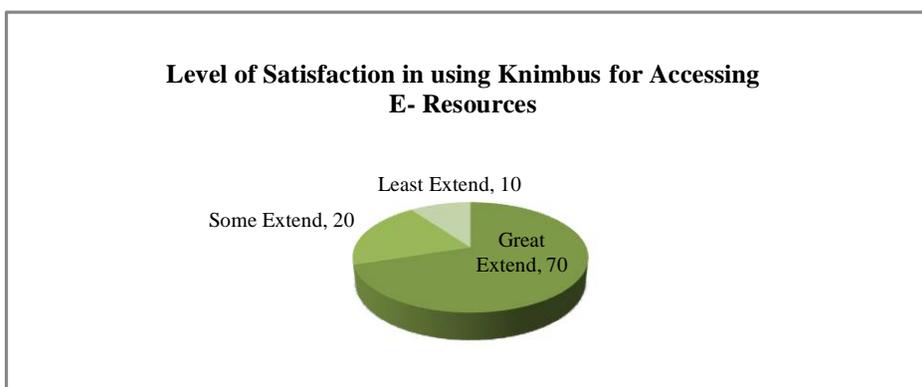


Figure 6.10 Level of Satisfaction in using Knimbus for Accessing E - Resources

Figure 6. 10 indicates the level of satisfaction in using Knimbus for accessing e resources shows around 70% responded great extend satisfaction as this being in a single platform which was saving the time browsing through various other publisher. Some extent satisfaction was around 20% and least extend satisfaction was highlighting 10%. Over all Knimbus has benefited the stakeholders in downloading various e-resources in a minimal time.

7. SUMMARY

1. 40% of the stakeholder’s respondents were between the age group of 41-50years.
2. 70% have responded effective usage of downloading journals through Knimbus.
3. 50% of the stakeholders said it is very useful using Knimbus for journal finders.
4. Many of them have acquired skills from their colleagues in using Knimbus.
5. Overall stakeholders preferred Knimbus as it is in a single platform they could download the subscribed journals plus the open access journals.

8. RECOMMENDATION

1. As Knimbus has been benefitting the stakeholder’s in downloading from a single platform, it is recommended that the engineering institution can be benefited by subscribing to the Knimbus.

2. The stakeholder's and the library professional need to be trained on the effective usage of Knimbus.
3. The stakeholder's can not only exchange ideas, can also share and create content in a innovate manner, which benefits all.

9. CONCLUSION

This paper highlights and facilitates various e-resources being subscribed by the institutions and used by the stakeholders through Knimbus platform effectively. Knimbus application model is based on SaaS model which enables the users to explore, exchange ideas, share and create content in a innovate manner. This helps as a value added service to all its users. Library professionals are also keen and enthusiastic in giving update information to all its stakeholders.

10. REFERENCES

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