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Accessibility and Use of Institutional Repository among Research Scholars: A Case of COMSATS Institute of Information Technology, Lahore

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Abstract

The study aimed to explore the level of accessibility and use of Institutional Repository (IR) among research scholars. It has also investigated the difference of opinion on the basis of participants' gender, age and qualification. Further, the need of training and guidance to make effective use of IR has also incorporated. Survey based on questionnaire was employed to collected data from M. Phil. and PhD scholars studying at seven departments of COMSATS Institute of Information Technology, Lahore. The results showed that research scholars are accessing IR infrequently and they have limited access to the publications. They have accessed the IR for the fulfillment of their assignments. They mentioned that they need extensive training for efficient use of IR. In context of Pakistan, the study will be helpful for other universities and institutions to make effective and efficient use of IR.

Keywords: Institutional Repository, Access and Use, University, Research Scholar, Pakistan

Introduction

In the globalized world, the significance of institutional repository (IR) in disseminating information has been gaining ground. Currently, digitization of scholarly outputs is the rapid growing phenomenon. Modified ways of generating, managing and disseminating the

information through the use of information and communication technology (ICT) have been introduced. For the development of the world, creating, sharing and exchanging the information are the imperative needs. Due to digitalization, libraries and information centers in the world are better equipped now. Academic Institutions as well as universities have been duly recognized as an essential infrastructure in their own right.

An IR is a digital research archive consisting of accessible collections of scholarly work that represents the intellectual capital of an institution[1]. Shreeves and Cragin[2] defined institutional repository as "an institutional repository is a set of services and technologies that provide the means to collect, manage, provide access to, disseminate, and preserve digital materials produced at an institution" (p. 89). The digitization of scholarly outputs before and after publication enhances the academic prestige of the intuitions as well as the authors. IR is considered a fundamental benchmark to maximize the benefits of digital scholarship (DS).

IR provides an immediate and futuristic valuable complement to the existing scholarly publishing model. Ogbomo and Muokebe[3] viewed that "Institutional Repositories may be defined as a type of digital library established by an institution, populated by staff, researchers, students and other members of the institution and to be consulted by both members of the university and the outside world"

The development of IR transforms the intellectual communication by making it easier that is aimed to providing open access initiative (OAI) to the content. OAI is meant to provide free access to intellectual output through self-archiving in open access repository and permitting its users to make lawful access and use of research material with acknowledgement. Tella and Kwanya[4] presented the objectives of an institutional repository should include global visibility,

managing data on single site, providing open access of scholarly output and preservation of institutional research heritage.

The academic institutions through the use of ICT transform the academic environment in order to manage the research output including journal articles, conference papers, reports, theses and dissertation and teaching materials that helps generating, managing and disseminating digitally stored data. Warren asserts that on the other side of spectrum, the high costs of online journal articles made it difficult and challenging to subscribe most of the online academic publications[5]. In this regard, universities and different private associations spend a huge amount of money for creation of digital libraries (DL's) and institutional repositories.

As stated by Geurts et al.[6], there are four components of IR contributing towards scholarly dissemination that are; 1) Registration (identification of author's write up with intellectual property rights, 2) Certification (recognition of research quality of the data, 3) Awareness (availability of research data to stakeholders, 4) Archiving (preservation of a research work for a long time for future users. Further, the authors have proposed the core functions of an institutional repository as material submission, metadata application, discovery support, storing the data and content indexing.

Objectives

The study is carried out with following objectives:

- Find out the level of accessibility and use of institutional repository among university students

- Know the need of guidance / training to make effective use of institutional repository

- Find the difference of opinion among participants in terms of their gender, qualification and age.

Review of Literature

Infrastructure of IR and Encountered Challenges

A study carried out by Ratanya[7] to explore the level of access and use of institutional repository (IR) among faculty members at Egerton University, Kenya. The study mainly focused on the creation and development of IR at the university and to report its possible benefits for faculty members. A survey method was employed to collect both quantitative as well as qualitative data from 84 faculty members of the Egerton University. The findings were quite discouraging as most of the faculty members were found unaware of the existence of IR at university. The staff had also faced problems and challenges while accessing and using IR. The main purpose of access of IR was reported to get research articles and information. The papers had also provided practical suggestions to tackle with the challenges while accessing and using IR.

Dawson and Yang[8] had reviewed copyright policies and structure of the websites of the hundred institutional repositories and archives. These guidelines were provided for the contributors of the IR including faculty members and librarians before depositing the material to institutional repositories. The study revealed that open access is not an easy deal. It had also been found that most of the libraries and institutions were not getting permissions of publishers.

Koler-Povh, Mikoš, and Turk[9] dealt with the case of Digital Repository of the University of Ljubljana, Faculty of Civil and Geodetic Engineering) of the University of Ljubljana, Faculty of Civil and Geodetic Engineering (UL FGG) from the beginning since 2011. The repository has been also been named as write full DRUGG. The study has highlighted role of the institutional

repository in enhanced visibility of research heritage of the university and further thrown light on the role of all stakeholders in its building. Web as well as Google Analytics have been used to show the visits, downloads and other statistics of use of the intuitional repository. The results showed wider use of the DRUGG repository especially archived these collections. The major visitors (89%) used the repository from public domains however only 11% accessed the repository from University's domain.

Asadi, Abdullah, Yah, and Nazir[10] had conducted a systematic review based study to know the situation of IRs in context of higher education learning and had also provided future directions for research. The study had posed the benefits of use of IR by institutions for the enhanced visibility of their academic staff, increased research and development culture and benefits of ranking at national and international levels. Further, major challenges reported by reviewed studies were lack of knowledge and inadequate information regarding IRs among faculty members and lack of infrastructure of information and communications technologies.

Accessibility, Adoption and Use of IR

Phillips, Andrews, and Krahmer[11] carried out an interesting study to know the overlap use of digital repository and institutional repository of University of North Texas. The user's logs, clicks and sessions have been analyzed and found that users are easily navigating among items which are interrelated and also founding items which are accessed more than other items. The study suggested that the university should work on the development of metadata fields and availability of improved interface with faceted navigation.

A most recent study conducted by Nunda and Elia[12] to explore postgraduate students' adoption and use of institutional repository at Muhimbili University of Health and Allied Sciences and

Sokoine University of Agriculture. Mixed method has been employed using both questionnaire and interviews to collect data from 55 respondents selected through simple random sampling technique. Low level of awareness among respondents has been reported. Further, less than of the respondents indicated that they are using institutional repository. Parallel, low adoption rate of intuitional repository among students has been reported. Enhanced visibility and information sharing are the benefits pinching students to use and adopt institutional repository. The study strongly recommended the implementation of information literacy practices and required trainings.

Mnzava and Chirwa[13] carried out a study aimed to know the awareness, use, deposit practices among faculty members at Sokoine University of Agriculture. The data have been collected by employing questionnaire among faculty members of College of Veterinary Medicine and Biomedical Science (CVBMS). The low level of awareness regarding IR has been found and library, internet and staff meetings are considered sources of awareness. Unawareness regarding deposits to the repository has been reported and as a result most of the faculty members have never deposited their scholarly works. The major obstacles to the effective use of IR are reported as lack of awareness of existence of IR, fear of plagiarism, lack of training and skills and lack of time.

Lee, Burnett, Vandegrift, Baeg, and Morris[14] conducted a case study to explore the accessibility and use of institutional repository by investigating the use of Flora State University's institutional repository which has archived through *DigiNole Commons*. In this way, 170 archived faculty publications have been searched by using Google and Google Scholar. This quantitative measure has also been supported by qualitative data collected through interviews conducted with faculty members. The studies found that majority (96%) of articles are available

full-text while 145 (85.3%) article found with the metadata from the search engines. The study demonstrated that the repository is substantially contributing to the accessibility and availability of the research articles.

Institutional Repository in Context of Pakistan

In context of Pakistan, a study carried out by Warraich and Ameen[15] explored the level of expertise of LIS staff members to the use of Higher Education Commission, National Digital Library (HEC NDL), satisfaction level of users and challenges faced by LIS staff members. The study opted a mixed of survey questionnaire, focus group interviews and observation. The study has reported under use of HEC NDL among library staff while provide services to the users. Even, a great number of them have acclaimed accessibility issues of HEC NDL.

Similarly, Safdar and Rehman[16] conducted a research study to investigate the users' satisfaction level of Higher Education Commission Pakistan Research Repository (PRR). In this regard, users' awareness, perception, use and encountered problems and possible opportunities have been analyzed. Data have been collected from 400 users through a semi-structured questionnaire. The majority of the respondents have been informed by library regarding existence of PRR. Further, majority of the users have accessed the repository for retrieval of material. Many of the users retrieved as well as deposited their scholarly work to the repository.

Research Design

The selection of an appropriate research design is significant in view of any given research study. The objectives of this study led to the adoption of quantitative research design. It has been endorsed by Creswell[17] that quantitative research methodology is suitable in determining the beliefs, attitudes and behavior of individuals towards any particular phenomenon.

Survey Research Method

Survey research method using questionnaire has been employed to collect data from participants of the study. Creswell[18] states "survey design provides quantitative or numeric description of trends, attitudes or opinion of a population by studying a sample of that population. From sample results, the researcher generalizes or makes claims about population" (p. 145). Moreover, it facilitates relatively a small numbers of participants to generalize the results at larger population.

Population

Students who were enrolled in M. Phil. and Ph.D. programs at seven departments of COMSATS Institute of Information Technology, Lahore were considered as population. These departments include; Department of Physics, Department of Statistics, Department of Computer Sciences, Department of Chemical Sciences, Department of Electrical Engineering, Department of Management Sciences and Department of Mathematics.

Sample

The total population for this research study is 725. Out of 725, 611 were M. Phil. and 114 were Ph.D. students. The 'Sample Size Calculator' had suggested that 320 is the representative sample size for the population of this study. Hence these students were approached using simple random sampling technique. The following table shows the sample details:

Instrument of the Study

The questionnaire employed in the study consisted of two parts; (i) demographical information of participants (ii) usability of IR. In the first part of the questionnaire, there were

two sub-sections; (i) access and use of IR (ii) need of guidance/training for using IR. Five-point Likert scale was used which was categorized from strongly disagree to strongly agree.

Reliability of the Instrument

The collected data from participants was inserted into SPSS 21 and Cronbach's alpha coefficient was applied to check the reliability of the instrument. The reliability of the questionnaire was .704 which was considered satisfactory.

Data Analysis

In carrying out this research study, 320 questionnaires were distributed to the actual population and 290 questionnaires were returned back with the response rate of 90 percent. The data analysis covers demographics of respondents, frequencies of statements, compare mean, T-test and ANNOVA test.

Demographical Information of the Respondents

The first part of the questionnaire was based on demographical information of the respondents. This section presents three demographical variables i.e. gender, age, and qualification. Graphic representation of these variables is given below.
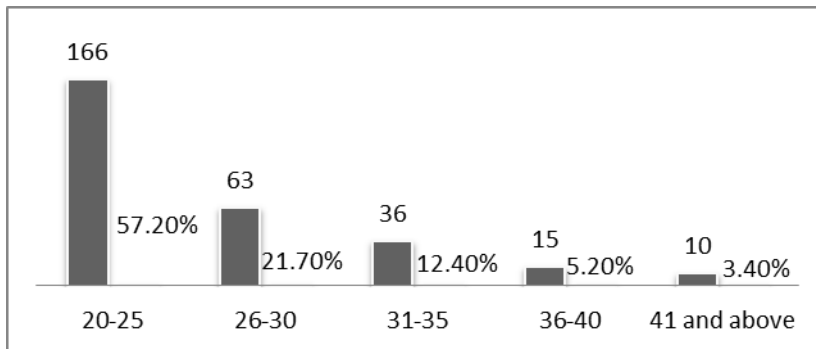
Figure 1

Gender of the Research Scholars
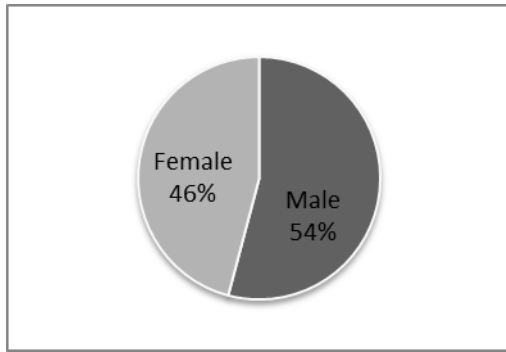
The chart given in figure 1 clearly reveals the slighter difference of male and female participation in the study with male participation of 54% and female participated 46 %. This slighter difference is unintentional may be due to the ratio of students in the selected sample.
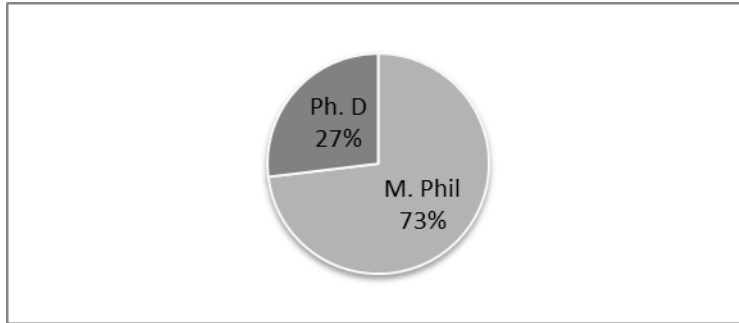
Figure 2

Age of the Respondents

More than half of the participants fall in the age range of 20-25 followed by a good number of them fall in age range of 26-30 however only 3.40% are found more than 41 years of age. This showed that majority of the participants are young.

Figure 3

Qualification of the Respondents

The figure showed a wider difference among M. Phil. and Ph.D. scholars which is due to the difference of assigned seats in a university for M. Phil. and Ph.D. students.

Table 1

Need of Guidance / Training for Effective Use of IR

Statement	1 SD	2 D	3 U	4 A	5 SA	M	SD
I have been provided with appropriate instructions/guidance regarding the services/utility of IR.	29 (10%)	33 (11.4%)	33 (11.4%)	154 (53.1%)	41 (14.1%)	3.50	1.16
I need further guidance to utilize the services of IR.	9 (3.1%)	26 (9.0%)	32 (11%)	154 (53.1%)	69 (23.8%)	3.86	.984
Interface of IR is user-friendly (easy to use).	9 (3.1%)	27 (9.3%)	37 (12.8%)	156 (53.8%)	61 (21%)	3.80	.977
I need extensive training / guidance to effectively use IR.	6 (2.1%)	22 (7.6%)	29 (10%)	143 (49.3%)	90 (31%)	4.00	.950
I always find help when required.	9 (3.1%)	38 (13.1%)	54 (18.6%)	128 (44.1%)	61 (21%)	3.67	1.04

1= Strongly Disagree, 2= Disagree, 3= Undecided, 4=Agree, 5=Strongly Agree, M= Mean, SD=Stranded Deviation

The results shown in table 1 highlight that majority of the respondents (233, 80.3%) agreed that they needed extensive training/ guidance to effectively use IR and highest mean value of the section is 4.00 while 28 (9.7%) participants disagreed with this statement. Results also reveal that 76.9% (223) respondents agreed that they needed further guidance to utilize the services of

IR with the mean value 3.86 while (35, 12.1%) participants disagreed that they did not need further guidance to utilize the services of IR. Regarding the statement that IR interface is easy to use 217 (74.8%) participants agreed with this statement and 36 (12.4%) participants did not agree with this statement. 189 (65.1%) respondents accepted that they always found help when they required with the mean value 3.67 and very few of the participants (47, 16.2%) disagreed with this statement. Table 4 also shows that (195, 67.2%) respondents agreed that they had been provided with appropriate instructions/guidance regarding the services/utility of IR with lowest mean score 3.50 while 21.4% respondents also disagreed with this statement.
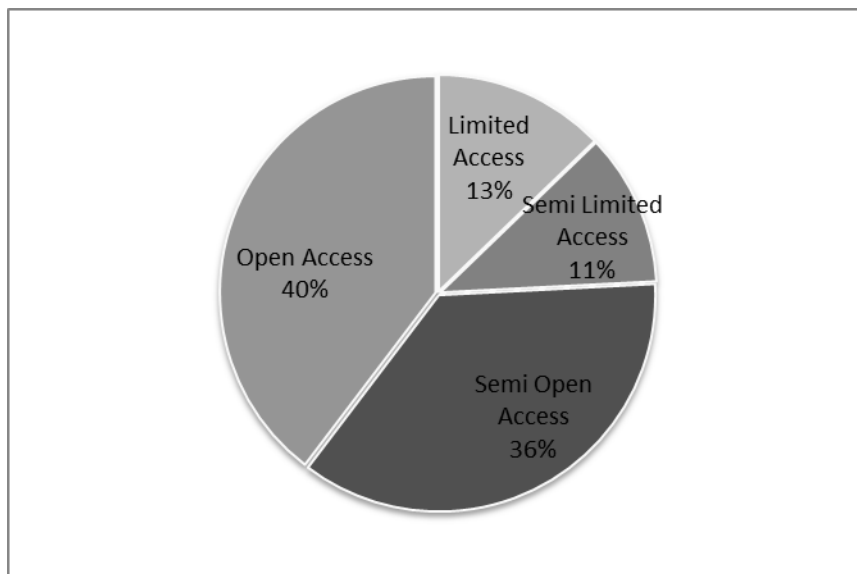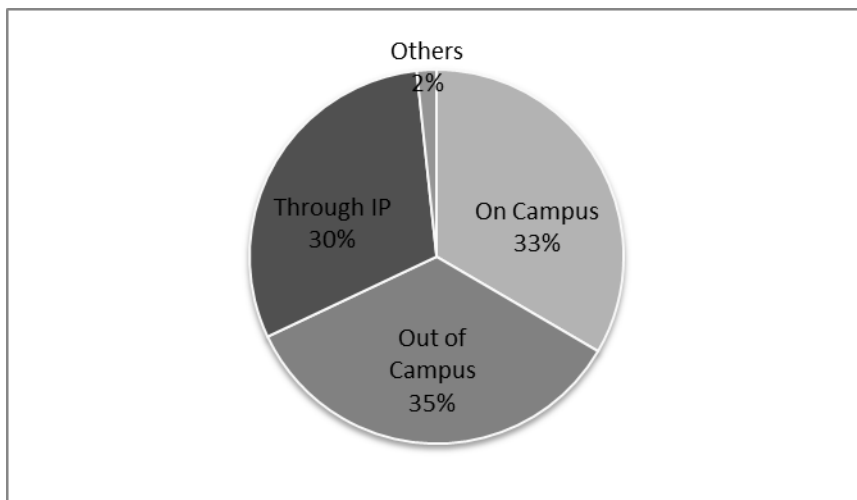
Figure 4

Access and Use of IR

Figure 4 clearly shows that 115 (40%) participants have preferred open access to IR while 105 (36%) respondents rated semi open access to IR. 37 (13%) participants rated limited access to IR while very few 33 (11%) participants rated semi limited access to IR.
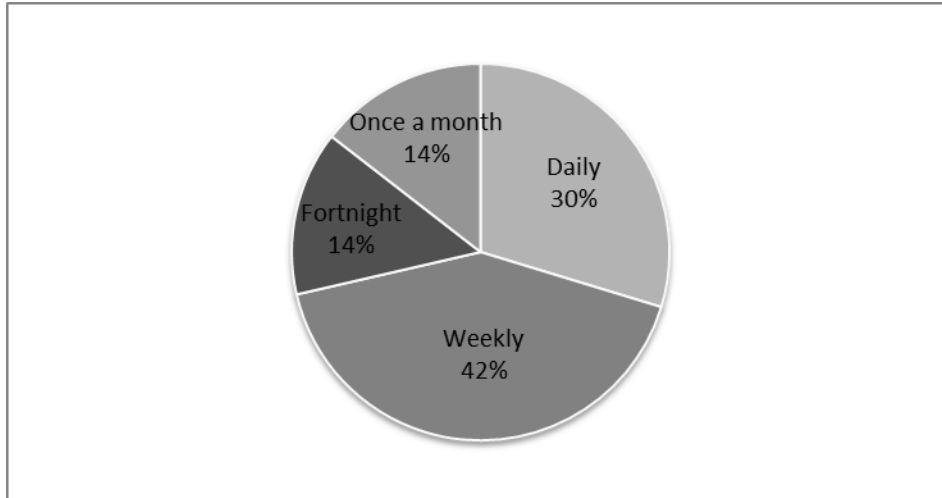
Figure 5

Mode of Access

The results shown in figure 5 demonstrate that 100 (35%) participants said that they accessed IR out of campus while 97 (33%) respondents accessed IR within campus. Out of total number of respondents (290) only 97 (30.3%) respondents accessed IR through IP and very few (5. 2%) used other mode of access.

Figure 6

Frequency of use of IR

The results shown in figure 6 elucidate that 121 (42 %) participants used IR on weekly basis while 86 (30%) participants used IR on daily basis. 41participants (14%) used IR once a month and 42 (14%) used after every two or three weeks a month.

Table 2

Encouragement by Teacher/ Supervisor

Statement	1 Lowest	2 Lower	3 Neutral	4 High	5 Highest	M	SD
Your teacher/supervisor encourages you in contributing research content to your IR.	21 (7.2 %)	26 (9%)	64 (22.1%)	104 (35.9 %)	75 (25.9%)	3.64	1.16

The results shown in table 2 delineates that 179 (61.8%) respondents agreed that their teachers/ supervisors encourage them to contribute in research content to IR while 47 (16.2%) disagreed with this statement. 64 (22.1%) participants were neutral regarding this statement. The mean value of encouragement by teacher/ supervisor to use the IR is (M=3.64 and SD=1.16).

Table 3

Information Usage from Institutional Repository

Statement	1	2	3	4	5	M	SD

	Lowest	Lower	Neutral	High	Highest		
How do you rate the information usage form IR?	11 (3.8 %)	29 (10 %)	88 (30.3%)	88 (30.3%)	74 (25.5%)	3.64	1.08

The results show that more than half (162, 55.8%) of the researchers gave high rate to the information usage form IR whereas (88, 30.3%) respondents were neutral on this statement. Only 40 (13.8%) participants were given low rate on information usage from IR. The overall mean value of information usage from IR is (M=3.64 and SD=1.08).

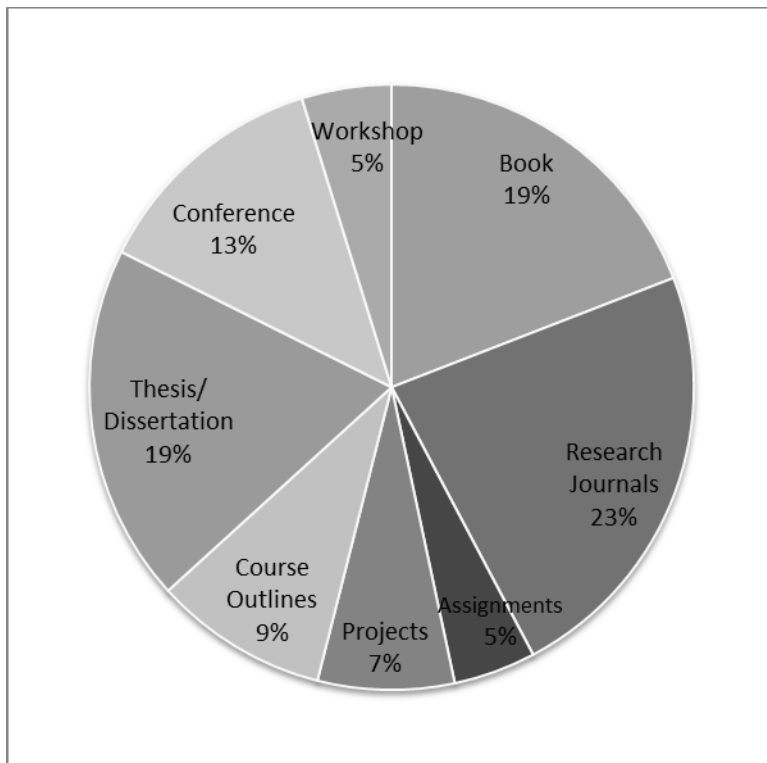**Figure 7**

Kind of Sources

Figure 7 demonstrated the kind of sources which researchers used in their research. 198 (23%) researchers used research journals from IR while 164 (19%) researchers used books and thesis/ dissertation from IR during their research. The result of figure 7 shows that 110 (13%)

participants used conference source from IR. A very few respondents used different kind of sources for different purposes i.e. course outlines 80 (9%), projects 63 (7%), workshop 41 (5%) and assignments 38 (5%) respectively.

Independent Sample t-test with Gender

A t-test statistical significance indicates whether or not the difference between two groups exists. Averages most likely reflect a real difference in the population from which the groups were sampled. The significance p value is (.05).

Table 4

Independent Sample t-test and Chi-square test with Gender

Group Statements	Male N=157		Female N=133		*t*	*p*	*χ2*	*P*
	Mean	SD	Mean	SD				
Access and Use of IRs	14.78	2.58	15.63	2.62	-2.74	.006	47.30	.000
Need of Guidance/Training	17.87	3.69	19.93	3.76	-4.69	.000	84.67	.000

Table 4 shows the independent sample t-test and chi-square test of study variables with gender. In the table (7) 157 were male and 133 were female participants. The results show that females are more aware than male participant regarding the knowhow of IR.

Table 5

Independent Sample t-test and Chi-square test with Qualification

Group Statements	M. Phil N=212		PhD N=78		T	p	χ2	P
	Mean	SD	Mean	SD				
Access and Use of IRs	15.10	2.57	15.35	2.80	-.689	.492	28.14	.014
Need of Guidance/Training	18.90	3.71	18.61	4.24	.524	.601	42.18	.001

The results shown in table 5 demonstrate that there is no significance difference between M. Phil. (n=212) and Ph.D. (n=78) researchers with study variables. Results showed the value of need of access and use of IRs (p=.492) and guidance/training (p= .601) as both *P* values are more than .005 so, there is no significant difference of opinion between M. Phil. and Ph.D. researchers. Chi-square test with qualification variable shows that there are statistically significant association between qualification and IR variables that are both M. Phil. and Ph.D. have difference of opinion regarding intuitional repository.

Applying ANNOVA test with Age

ANNOVA statistical significance test is applied when the category of demographical variables are three or more. This test indicates whether or not the difference between three groups exists.

Table 6

ANNOVA test with Age of the Respondents

Group Statements		Mean Square	F	p
Access and Use of IRs	Between Groups	4.01	.575	.681

Within Groups	6.98		
Need of Guidance/ Training Between Groups	39.91	2.74	.029
Within Groups	14.55		

The results shown in table 6 demonstrate that study variables have significance *p* value with need of guidance/ training (.029) all the values less then significance *p* value (.05) except access and use of IR because of higher value of *p* (.681). The results show that there is significant difference between age and study variable while reporting need of guidance / training only.

Findings

The current study has investigated the role of IR in fulfilling the information needs of private sector universities' research scholars. COMSATS Institute of Information Technology, Lahore is selected specifically for this study because of its operational IR. The IR of COMSATS is working properly and researchers use this research repository for their research projects. So, the matter of the fact is that IR plays a vital role in the research of COMSATS researchers and faculties as well. The following conclusions are drawn on the basis of data analysis:

- The results of the study show that males are more in number and M. Phil. researchers are more than Ph.D. researchers. The researchers of current study are very young as mostly fall in age group of 20-25.

- The results of the study also show that IR has diverse range of resources and researchers have also given preferences to IR while doing their research projects, assignments and proceedings etc.

- However, significant number of the researchers who felt the need of extensive training/ guidance to efficiently use IR. Researchers also required hands-on-practice to utilize the services of IR.

- The frequency of IR has found infrequent as most of the researchers using IR on weekly basis and they also claimed that they have limited access to IR as full-text of some of the articles are not available.

- The faculty members of COMSATS Institute of Information and Technology are highly encouraging for M.Phil. and PhD scholars to utilize IR while working on their research projects, assignments or dissertations.

- Majority of scholars are using research repository for the fulfillment of their research projects assigned by their teachers and they report that they can easily approach journal articles and thesis/dissertation.

- The students have also 'commented' that university administration is playing its role for the promotion and better development of IR and students have mentioned that they can find their relevant stuff in IR. Researchers find all research related publication from the IR.

- The students are provided with required hands-on-practice or guidance while approaching required resources through IR. However, some of them require extensive help and suggested commencement of seminars and workshop for better utilization.

- Variables of Gender and education have difference of opinions with different study variables (awareness, availability of sources, need of guidance/training, and access and use of IR's).

Recommendations

On the basis of findings and conclusion, following recommendations were made:

- University authorities should conduct different IT based programs, seminars, and workshop to increase the awareness to not only researchers and graduate students.

- The authorities should provide opportunities to researchers as well as information professionals for Continuous Professional Development (CPD) programs for professional and research growth of information.

- All public and private sector universities/ IR of different disciplines should work with cooperation to produce more confident and attentive professionals.

- All public and private sector universities should develop their own IR for the purpose of increasing the research culture.

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