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Awareness and Availability of Institutional Repository: Perceptions of Pakistani Research Scholars

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ABSTRACT

Information has become a valued commodity in this age of globalization. Information centers all over the world are now better equipped to manage information due to advancement in Information and Communication Technologies (ICTs). In this context, Institutional Repositories (IRs) provide a unique platform for information management through new ways of Information Storage and Retrieval (ISR) and digitization. The awareness regarding Open Access Publishing (OAP) and attitudes of IR users are very important contributing factors in success of any institutional repository. The paper is an attempt to highlight the necessary role of IR in building the academic capabilities of research scholars in South Asian region. This paper focuses on perception evaluation of research scholars regarding IR in terms of awareness, and availability of IR. A questionnaire based survey method has been employed to collect data from research scholars. It has been found that most of the participants are aware of the existence of the IR. They showed that they are capable to use IR. The study will be helpful in providing practical implications for other institutions to initiate IR.

Key Words: **Institutional Repository (IR), Open Access Publishing (OAP) Pakistan, Information Need, Awareness, Availability**

Introduction

Institutional Repositories (IRs) provide a unique platform for information management through digitization. Shreeves and Cragin (2008) define IR as "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 role of IR is also to provide a collaborative research vessel for knowledge generation in academic institutions (Moahi, 2003; Paul, 2007).

It is important that how IR is being built and utilized by academic organizations keeping in view the needs of their research scholars. In this context, research scholars should be made aware through proper academic guidance on how to access and use the available resources provided by IR.

In Pakistan, Pakistan Research Repository (PRR) was the first IR of national posture, built under the auspices of Higher Education Commission (HEC) in 2006

(Ullah & Rafiq, 2014). Universities are developing infrastructural bases to develop their own institutional or digital repositories across Pakistan.

This paper is an attempt to highlight the necessary role of IRs in building the academic capabilities of research scholars. This study specifically focuses on the role of IR meeting the needs of research scholars in COMSATS Institute of Information Technology, Lahore, Pakistan. Keeping in mind the involvement in research related activities, M. Phil. and PhD scholars of the institute are included in the study population. The study will infer the level of awareness and availability of institutional repository. The study will be helpful in providing a scenario and implementation of IR among Pakistani scholars.

Infrastructure of institutional repository

The institutional repository is not only a research archive but a research heritage of the any institution. The most important aspect of IR is information collection. There are different kinds of sources stored in IR such as books, research journals, research projects, periodicals, conference proceedings, archives, preprints, post prints, journal articles, conference papers, yearly reports and professional's reports. The repositories are warned by Lynch, (2003) to show their control or asserting ownership on deposits / submissions by students / faculty members of the institution.

Roosendaal and Geurts (2007) describe four components of IR:

1. Registration (identifying the author of writings having intellectual property rights)
2. Certification (recognizing research quality of the content)
3. Awareness (making research contents available to stakeholders)
4. Archiving (long-term preservation of the research writings for future use)

IR employs different kinds of softwares such as D-Space, E-print etc., providing information to research scholars through digital means. IR categorizes data by group, gathering, issue date, author, title, subject, year, keyword, advance search, document type, and e-print sort (Marsh, 2015).

There is a need to observe copyright laws while choosing materials for digitization and setting up get to strategies for digital libraries and IRs. The copyright explanations on digital content in libraries should be clear. IR has a duty to give copyright information to the user and to teach them about the reasonable user of digital collection of information.

Research scholars' awareness and attitude towards IR

Hansen, Shneiderman, and Smith (2010) define information needs as "researcher's desire to locate and obtain information to satisfy a conscious or unconscious need" (p. 23). The term information need is basically the method that how the learner or the individual should search the information or the material according to one's needs and requirements.

Cole (2011) focuses on the importance of providing the right information at the time to the right person, especially when it comes in context to the researcher. The essential part for any organization is the timely availability of the right information. This not only helps the organization to perform its managerial functions effectively but also lets the organization to accomplish its goals and objectives in an efficient manner. In this context, expansion of the digital landscape has overall provided the tremendous opportunities for IRs to support and meet the needs of research scholars in academic institutions.

A study conducted by Halder, and Chandra, (2012) to determine the awareness level of institutional repository, institutional repository software, academic publishing through institutional repository and users' attitudes. A survey questionnaire has been distributed among 200 users. Most of the users indicated that they are aware of IR and IR software. They got awareness mostly through their colleagues / friends followed by library website.

An exploratory study conducted by Kyriaki-Manessi, Koulouris, Giannakopoulos, and Zervos, (2013) to explore the attitudes of faculty members and effectiveness of Institutional Repository (IR) within university setting and found positive attitude of faculty members due to proper communication and marketing of IR and providing infrastructure to handle with its technical support.

Similarly, a research study has been conducted by Bamigbola, (2014) to survey attitudes of faculty members and use of institutional repository among faculty members of agriculture, Federal University of Technology, Nigeria. In this respect, the study has employed diffusion of innovation (DOI) and theory of reasoned action (TRA). The study has inferred that level of awareness among Agriculture Faculty is increasing and they are approaching IR positively yet the work submission rate found very low.

The above findings have also been supported by another research study Yang, and Li, (2015) to know the faculty members' attitude towards Open Access Publishing (OAP) and their agreeableness to contribute in institutional repository. A questionnaire was distributed using web survey tool. The response towards awareness has found positive yet they are unaware of the process to electronically submit their publications. Copyright issues and considering low quality material on institutional repository found other hindrances for faculty members to submit their content.

During the research process, research scholars face numerous challenges and issues regarding meeting the ends to their research goals. These problems can be in the form of unavailability or lack of resources, barriers in accessing the required information, absence of proper administrative structures to direct and guide students on utilizing the available research resources in the right academic way etc. IR in this regard can be of great help to overcome such academic barriers during the research process.

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 suggested by Creswell (2012) that quantitative research methodology is suitable in determining the beliefs, attitudes and behavior of individuals towards any particular phenomenon.

Survey research method using questionnaire has been employed to collect data from participants of the study. Creswell **(**2009) 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 including low numbers of participants to generalize the results at large population.

Population and sampling

Students enrolled in M. Phil. and Ph. D programs at seven different departments of COMSATS Institute of Information Technology, Lahore are considered for the population of this study. The 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.

The total population is 725 comprising 611 M. Phil. and 114 PhD students. The 'Sample Size Calculator' had suggested that 320 is the representative sample size. These students approached employing random sampling technique. The following table shows the sample details:

Table 1
Population and sample size of the study

Department Name	**Total Number of M. Phil and PhD students**	**Total students**	**Total students participated in final study**
Department of Physics	78+17	95	41
Department of Statistics	93+19	112	54
Department of Computer sciences	117+17	134	44
Department of Chemical sciences	113+16	129	50
Department of Electrical Engineering	67+11	78	40
Department of Management Sciences	82+15	97	33
Department of Mathematics	61+19	80	28
Total	**611+114**	**725**	**290**

Instrumentation

The questionnaire has two parts; (i) demographic information of participants and (ii) usability of IR. In first part, there were two sub-sections; (i) awareness of IR and (ii) availability of sources for developing IR. Five-point Likert Scale was used from strongly disagree to strongly agree.

After data collection from pilot study participants, Cronbach's alpha coefficient was applied to check the reliability of the instrument. The reliability of the questionnaire was .704 which was considered satisfactory.

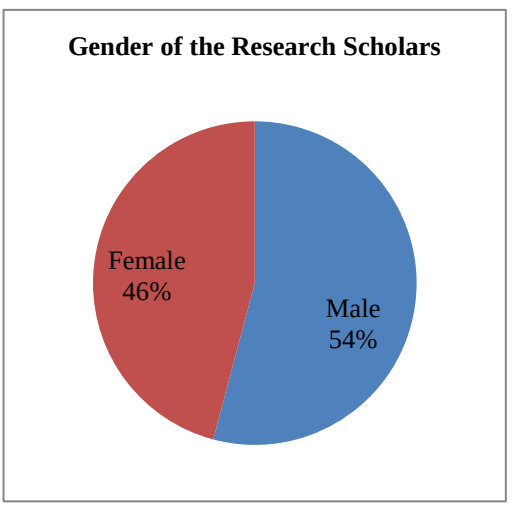
Data analysis

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

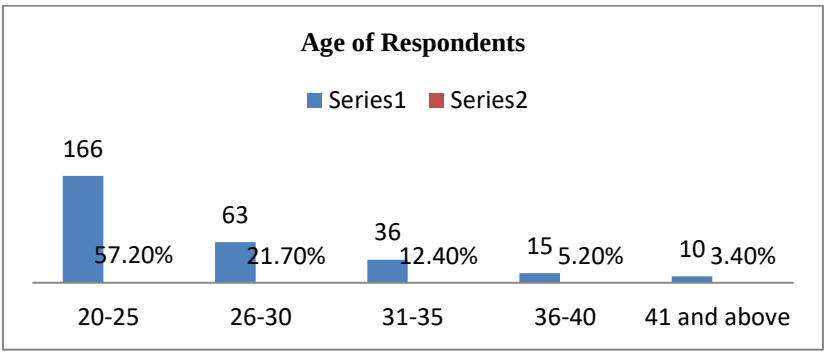
The first part of the questionnaire was based on demographical information of the respondents. This section presents three demographical variables i.e. gender, age, and qualification. Graphic representation of these variables is given below.

Figure 1
Gender of the Research Scholars



The figure 1 shows that male participants are 157 (54%) while females are 133 (46%). The male representation is little higher unintentionally.

Figure 2
Age of the respondents



The figure 2 highlights that more than a half of the respondents (166, 57.20%) fall in age range of 20-25 while only 63 (21.70%) fall in age range of 26-30. Further, very few 36 (12.40%) from 31-35 age range and rest of them 15 (5.20%) participants have the age range of 36-40.

Figure 3
Qualification of the respondents

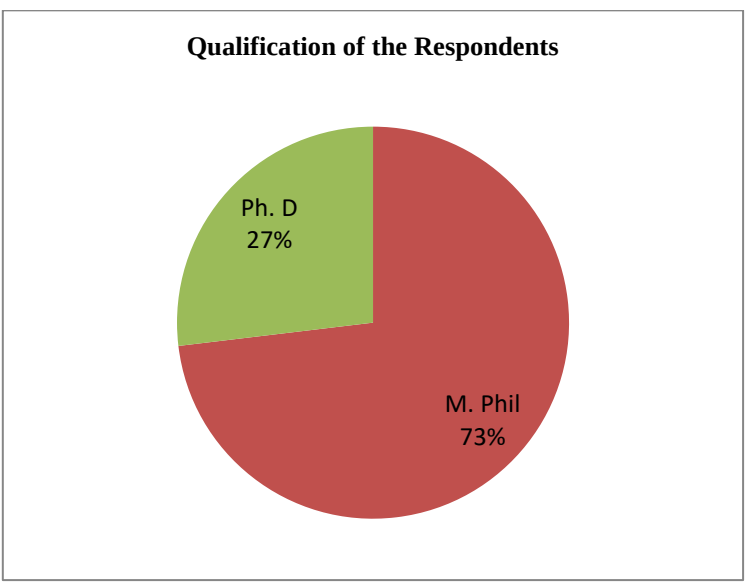


Figure 3 demonstrates that majority of the respondents 212 (73 %) are doing M. Phil and only 78 (27%) respondents were doing Ph. D in different selected subjects.

Frequency of study variables

The second section of the questionnaire was based on different statements under the subsection i.e. awareness about IR and availability of sources. The analysis infers frequencies, mean and standard deviation of each statement.

Table 2
Frequency of awareness

Statement	1 SD	2 D	3 U	4 A	5 SA	M	SD
I am aware of the presence of research repository in our Institution.	34 (11.7%)	31 (10.7%)	16 (5.5%)	168 (57.9%)	41 (14.1%)	3.52	1.20
I am aware of the purpose served by IR.	4 (1.4%)	36 (12.4%)	39 (13.4 %)	149 (51.4%)	62 (21.4%)	3.79	.963
I am capable of searching, evaluating and accessing resources.	4 (1.4%)	35 (12.1%)	32 (11%)	128 (44.1%)	91 (31.4%)	3.92	1.01
University administration has promoted IR for students' awareness.	14 (4.8%)	46 (15.9%)	32 (11%)	108 (37.2%)	90 (31%)	3.74	1.19

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

The table 2 shows the agreeableness to disagreeableness of study participants. The majority of the participants (219, 75.5%) agreed with the statement "I am capable of searching, evaluating and accessing resources" with highest mean 3.92 while 40 (13.5%) participants disagreed with this statement. The second highest mean value (3.79) of the statement "I am aware of the purpose served by IR" 211 (72.8%) respondents agreed on the contrary only 40 (13.8%) participants showed disagreed. Most of the participants (198, 68.2%) agreed that university administration had promoted IR for student's awareness with the mean value 3.74 and 60 (20.7%) participants showed inversely. A greater number of participants 209 (72%) found aware regarding the presence of research repository in their institution and (70, 22.4%) found unaware regarding existence of IR in their institution with the lowest 3.52 mean value.

Table 3

Frequency of availability of sources.

Statement	1 SD	2 D	3 U	4 A	5 SA	M	SD
IR has diverse range of resources (articles, assignments, lecturers etc.)	19 (6.6%)	30 (10.3%)	17 (5.9%)	148 (51%)	76 (26.2%)	3.80	1.13
I am satisfied with the availability of required sources from IR.	8 (2.8%)	52 (17.9%)	41 (14.1 %)	126 (43.4%)	63 (21.7%)	3.63	1.09
I am satisfied with the services provided by IR.	24 (8.3%)	19 (6.6%)	53 (18.3 %)	129 (44.5%)	65 (22.4%)	3.66	1.14
Current and updated sources are uploaded on IR.	15 (5.2%)	28 (9.7%)	35 (12.1 %)	171 (59 %)	41 (14.1%)	3.67	1.00
I can find all faculty and research related publications on IR.	13 (4.5%)	35 (12.1%)	39 (13.4 %)	127 (43.8%)	76 (26.2%)	3.75	1.10
Research repository is my first priority to search while doing any research project.	6 (2.1%)	27 (9.3%)	30 (10.3 %)	141 (48.6%)	86 (29.7%)	3.94	.979

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

The results mentioned above in table 3 shows that 227 (78.3%) participants agreed that research repository is the first priorities of researchers with (3.94) mean value while 33 (11.4%) participants disagreed with this statement. Majority of the respondents 224 (77.2%) participants agreed that IR had diverse range of resources (articles, assignments, lecturers etc.) with the second highest mean value (3.80) and 49 (16.9%) participants showed inverse attitude. A huge number 203 (70%) of respondents could find faculty and research related publications on IR and (16.6%) disagreed with 3.75 mean value. Also, a majority of them 212 (73.1%) agreed that current and updated sources were uploaded on IR with the mean value 3.67 while the 194(66.9%) participants were satisfied with the services provided by IR with the mean value 3.66. A greater number of subjects 189 (65.1%) showed satisfaction with the availability of required sources from IR while 60 (20.7%) participants were not satisfied with the availability of required sources from IR.

Figure 4
Kind of sources

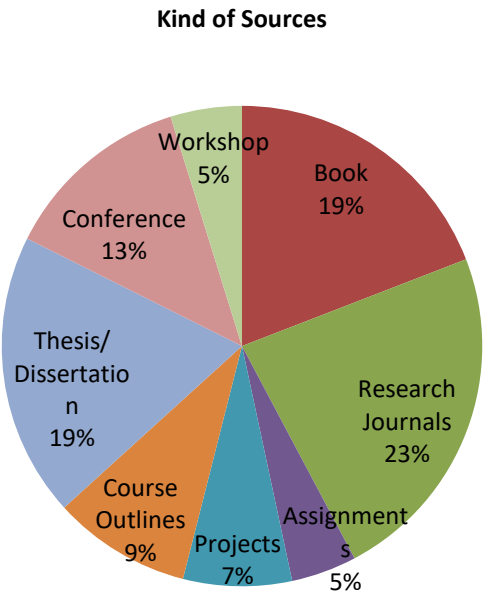


Figure 4 demonstrated the kind of sources which researchers used in their research. 23 percent researchers used research journals from IR while 19 percent researchers used books and thesis/ dissertation from IR during their research. The result of figure 4 shows that 13 percent participants used conference source from IR. A very few respondents used different kind of sources for different purposes i.e. course outlines (9%), projects (7%), workshop (5%) and assignments (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 samle t-test and Chi-square test with gender

Group Statements	**Male N=157 Mean SD**	**Female N=133 Mean SD**	***t***	***p***	**$\chi 2$**	***P***
Awareness	14.21 3.85	15.85 3.50	-3.76	.000	45.16	.000
Availability of Sources	21.77 5.42	23.28 5.10	-2.43	.016	70.80	.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 Mean SD**		**PhD N=78 Mean SD**	***T***	***p***	**$\chi 2$**	***P***
Awareness	14.96	3.72	14.97 3.96	-0.14	.989	62.30	.000
Availability of Source	22.22 5.24		23.12 5.50	-1.24	.211	50.04	.001

The results shown in table 5 demonstrate that there is no significance difference between M. Phil (n=212) and PhD (n=78) researchers with study variables. Results also show that awareness *(p=.989)*, availability of sources *(p= .211)*, both the values of p are more than .005 so, there is no significance difference of opinion between M. Phil and PhD 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 PhD 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
Awareness	Between Groups	78.87	5.89	.000
	Within Groups	13.38		
Availability of Source	Between Groups	130.82	4.85	.001
	Within Groups	26.92		

The results shown in table 6 demonstrate that study variables have significance *p* value with awareness (.000), availability of sources (.001), both the values are less than significance p value (.05). The results show that there is significance difference between age and study variables (awareness and availability of sources).

Cross tabulation of study variables

The basic purpose of cross tabulation is to identify the relationship between two variables according to row and columns in the tabular form. Frequencies of the variables show only one side information but cross tabulations precede information about bivariate relationships.

Table 7
Crosstab between gender and age of respondents

Age of the Respondents							
		20-25	**26-30**	**31-35**	**36-40**	**41 and above**	**Total**
Gender of the Respondents	Male	83	35	18	11	10	157
	Female	83	28	18	4	0	133
		166 (57.24%)	63 (21.72%)	36 (12.41%)	15 (5.17%)	10 (3.44%)	290

Table 7 shows the crosstab between demographical information of the respondents i.e. gender and age. This table shows that the ratio of male and female is equal (83) and 166 (57.24%) respondents age between 20-25 while age between 26-30 males (35) are more than female (28) and total number of respondents are 63 (21.72%) who participated in this study. The age (31-35) males and females equally participated (18) and total participations of this age section is 36 (12.41%). The ages of 11 males and 4 females are between 36-40 and total numbers of participants are 15 (5.17%). The ages of 41 and above of males are 10 (3.44%) and no females who have age of 41 or above.

Table 8
***Crosstab between gender with qualification* of respondents**

Qualification			
	Gender	**M. Phil**	**Ph D**
Gender of the Respondents	Male	118	39
	Female	94	39
	Total	212 (73%)	78 (27%)

The results shown in table 8 demonstrate that 118 male researchers are doing M. Phil degree while 39 male researchers are doing PhD degree. On the other hand, 94 female researchers are doing M. Phil degree and 39 female researchers are doing PhD in their respective disciplines. Total number of male and female researchers, who are doing M. Phil are 212 (73%) and 78 (27%) are doing PhD.

Table 9
Crosstab between qualification, gender & age

Qualification	**Gender**	**20-25**	**26-30**	**31-35**	**36-40**	**41 and above**	**Total**
M. Phil	Male	77	25	14	2		118
	Female	71	15	8	0		94
	Total	148	40	22	2		212
PhD	Male	6	10	4	9	10	39
	Female	12	13	10	4	0	39
	Total	18	23	14	13	10	78

The results shown in table 9 elucidates that there are 77 males and 71 females whose age was between 20-25 doing M. Phil while only 6 males and 12 females with same age group were doing PhD in different subjects. The male participants (25) were more than females (15) participants with age group (26-30) who were doing M. Phil while 10 males and 13 females were doing PhD. The third age category is 31-35 and only 14 male and 8 female scholars were doing M. Phil

while only 4 male and 10 female scholars were doing PhD. Only 2 male participants with age between 36-40 were doing M. Phil while 9 males and 4 females were doing PhD. The last category of age is 41 and above so no males and females whose age was between 41 and above were doing M. Phil but only 10 male were doing PhD in different subjects.

Table 10
Crosstab between gender with kind of sources.

	Gender of the Study		
Sources	**Male**	**Female**	**Total**
Book	87 (53%)	77 (47%)	164
Research Journal	94 (47.5%)	104 (52.5%)	198
Assignments of Students	15 (39.5%)	23 (60.5%)	38
Projects/ Reports	41 (65.1%)	22 (34.9%)	63
Course Outlines	44 (55%)	36 (45%)	80
Thesis/ Dissertation	98 (59.3%)	67 (40.6%)	165
Conference proceeding paper	65 (59.1%)	45 (40.9%)	110
Workshop	20 (48.8%)	21 (51.2%)	41
Total	**157**	**133**	**290**

The results shown in table 10 highlight that out of total number of participants 164, male participants (87, 53%) are using books from IR and more than female (77, 47%) while in research journal portion females are dominant than males i.e. (female=104, 52.5% and males=94, 47.5%). Majority of the respondents (165) are using IR for thesis/dissertation out of total respondents 98 (59.3%) males and 67 (40.6%) females. Out of total number of participants (110) more than half of the respondents (65, 59.1%) are males and 45 (40.9%) females use this for thesis and dissertation. 63 total number of respondents are using IR for their assignments and only 23 females (60.5%) and 15 males (39.5%) use IR.

Major findings and conclusions

On the basis of the results generated from T-test, Chi-square test, ANOVAs test and cross-tabulation of study variables, the findings and recommendations of this research paper are given below:

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 PhD researchers. The researchers of current study are very young as mostly fall in age group of 20-25.
- The level of awareness is found different on the basis of gender as female participants are found more aware about IR than males. The female participants show higher level of awareness regarding use of relevant technologies in IR.
- Majority of the researchers acclaim that they are capable of searching, evaluating and accessing their required resources with the awareness of IR.
- 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, there was a significant number of the researchers who felt 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 in some of the resources are not available full-text is 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 to the promotion and better development of IR and students have mentioned that they can find their related stuff in IR. Researchers find all research related publication from the IR.
- The students are provided 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 opinion 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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