

Utilization of Information Resources and Services and its Impact on the Research Output of Faculty at the University of Sindh Jamshoro, Pakistan

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Abstract

Purpose: The study examines the utilization of information resources and services and its impact on the research output of faculty members of Sindh University Jamshoro.

Design/methodology/approach: The study used descriptive survey research design. For data collection, a questionnaire was prepared using similar studies with some modification. The questionnaire with a Cronbach's alpha reliability coefficient ($\alpha=0.81$) was utilized on a total sample of 226 faculty members of the Sindh University Jamshoro, Pakistan, out of which 190 responded positively with a response rate of 84.07%.

Research limitation(s): The study is delimited to the Sindh University Jamshoro. Population of the study includes only regular faculty members. It does not include part-time, visiting or ad-hoc faculty.

Key finding(s): Results of the study revealed that faculty members used scholarly journals, abstracts and indices more heavily for their research needs. The study did not find any variations in terms of intensity of use of resources between male and female faculty. The social science research journals were read most, followed by journals related to the discipline of natural sciences. Results indicated that young researchers produced more research articles than the older faculty. They preferred to use the internet or online services offered by their respective libraries. Respondents evaluated information on the bases of accuracy, purpose and currency of information whereas they gave least importance to the interactivity with websites, authority of publisher and relevance of information while evaluating their required informational stuff for teaching, learning and research.

Practical implication(s): The study will help university librarians to design ways and means to satisfy the teaching, learning and research needs of university faculty.

Contribution to knowledge: The findings of this study will help in framing appropriate policies related to collection development and improvement of the quality of information resources and services in university libraries and information centers.

Paper type: Research.

Keywords: Information use; Information resources; Information services; Information literacy; Research output; University faculty members; Information dissemination.

Introduction

Availability and the use of information resources play a prominent role in teaching and research. The measure of academic success in academia is research productivity which requires information resources. The universities and other higher institutions set up libraries to make information resources available to assist academic staff members in their research quest ((Okiki 2013, Ali, Shoaib, & Asad, 2021). Citing Armstrong and Igbo, Okiki (2013) asserts that in order to understand the availability of informational stuff, It is essential for the teaching community of universities to have the skills of identifying what resources are available for exploitation, where they are available, how to have an access to them, what are the merits of individual resource, what are their kinds and when it is appropriate to use them. This may have great implication for academics research activities. It is necessary for one to decide where to look, what clues to search for and what to accept, especially, now that we are faced with staggering quality of information.

Several studies have suggested that credible information sources and services can enhance effectiveness, efficiency and the quality of education and research. In this regard information literacy of

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academics and their ability to quickly and effectively access necessary information for their research and academic pursuits can help them to make effective contribution to the growth and development of a nation. It is expected that an information literate person may feel more comfortable in doing his research. In universities, research productivity plays a vital part in achieving success since it is directly associated to job promotion and salary (Baloch, Siming, & Hong, 2020; Kotrlík et al., 2002; Baro, Oni, & Omyenania, 2009; Okiki, 2013). Several researchers (e.g. Bloedel, 2001; Jitpitak, 1989; Pabhapote, 1996; Popoola, 2008; Wichian, Wongwanich, & Bowarnkitiwong, 2009) have found that the utilization of credible information sources and services, personal characteristics and environmental factors have positive effects on the research output of faculty members.

Hence, this research study is designed to conceptualize and measure the utilization of information resources and their impact on the research output of faculty members of Sindh University, Jamshoro, Pakistan. The University of Sind – the oldest University of Pakistan, was established 1947. It was initially established in Hyderabad (Pakistan) soon after independence in 1947 which was later on shifted to its newly constructed campus at Jamshoro. It has eight faculties comprising of 50 postgraduate departments and institutes with 537 teaching faculty. The findings of this study, it is hoped, would help in understanding the utilization of information resources and their impact on the research output of faculty members of Pakistani universities in general and Sindh University in particular, which would help in framing appropriate policies related to collection development and improvement of the quality of information resources and services in university libraries and information centers.

Literature Review

A number of researchers have studied the information needs of teachers of various universities in Pakistan and elsewhere. For example, research studies conducted by Singh (1981), Ajidahun (1991), Ehikhamenor (1990), Jam (1991/1992), and Atilgan et al (2021) have established that the information necessities of university teachers are mostly job-oriented, especially to teaching and research which has been constantly highlighted in several studies. Several researchers such as Warriach and Tahira (2014), Tahira and Amin (2009), Njongmeta and Ehikhamenor (1998), Odusanya and Amusa (2003), Baker (2004), Bruce (2005), Macevieiute (2006), Bigdeli (2007), and Akusu (1987) found that information needs fluctuate as per the area of specialty of individual faculty. Existing literature affirms that availability and accessibility of information resources are two inseparable factors in determining information resources utilization (Odunlade, 2017). In a study on the impact of electronic information resources use on research output in Tanzanian universities, Manda and Nawe (2008) reported that e-information resources have a positive impact on the research activities of university teachers and research scholars. Similarly, Osman, Tseh, and Ahlijah (2021) asserts that E-resources are indispensable to teaching and research for the university faculty. Such type of resources are now widespread and are considered as catalyst for teaching, learning and research.

Warraich and Tahira (2014) in their study on impact of information and communication technologies on research and development: A case of the University of Punjab, found that due to various factors such as digital initiatives, availability of online information sources, educational policies, research incentives, and ICT infrastructures have a positive impact on the research output of university faculties in Pakistan. The study further pointed out that the resources and services provided by the HEC, especially, its digital library initiative, has facilitated the research community by providing easy access to a number of research-oriented databases in all fields of knowledge. Jan and Naveed (2020) conducted a study on the impact of HEC electronic information resources on research productivity of academicians and found that faculty members were well aware about the e-information resources and hence used them effectively for their teaching and research. However, the use of these resources were low. Similar findings have also been reported by Ahmed and Khan (2013) who found that HEC is providing a number of resources and services to the university faculty for teaching and research. Similarly, the findings of Omeluzor et al (2012) revealed that majority of faculty members knew and used e-resources more frequently for their research. The study found that the effective utilization of e-resources has heavily contributed to their academic research output. Heterick (2002) examined the perceived impact of e-resources on research output in US universities and

reported a high degree of perception of the effect of e-resources on research productivity among the respondents. The study established that such resources are valuable instruments for conducting research studies in America. Similarly, Nicholas et al (2010) reported that electronic information sources have left remarkable effects on the research output of researchers in the UK, a view common in developed countries.

Amin and Rafiq (2009) conducted a research study in order to know about the information searching pattern as well as satisfaction level of the faculty members of the National Textile University Faisalabad, Pakistan. Their study indicated that the respondents used both print and e-resources to satisfy their informational requirements. Printed material were the most important information source followed by scholarly journals and discussion with co-workers. The study revealed that the trend on dependency on the internet is increasing. The respondents showed disappointment over the library collection, especially showed concerns over the lack of printed books, magazines, scholarly journals, and latest reference books in their respective libraries.

In a study on information seeking habits of the education faculty, Serrano and Robbins (2013) found that faculty members took keen interest in electronic access to scholarly journals and books (both printed and electronic) for meeting their study and research needs. The findings of Bhatti (2009) indicated that most of the faculty utilized library resources for research. Young faculty such as lecturers made greater use of books, while senior faculty preferred to used periodicals, indices, abstracts, and reference material. Majority of the respondents considered their co-workers as their main informal source of information. Most of the respondents complained about the lack of indexing and abstracting services in their respective libraries. The study further found out that young faculty took keen interest in the internet for their informational needs as compared to senior faculty. Main problems identified by most of the respondents were lack of required material in their libraries, shortage of computers, and lack of current journals in the library.

Agboola and Oduwole (2005) examined the research output of professional librarians working in various academic libraries in Nigeria. The study revealed that 2.94% had more than twenty publications published in journals of repute, about 8% published ten to fifteen research articles, 17.56% had six to nine, 58.82% had one to five publications whereas 11.77% could publish nothing. Similar findings have also been reported by Ramsden (1994) and Athey and Plotnicki (2000).

Tahira and Ameen (2009) studies the information needs of S & T teachers of the Punjab University, Pakistan. The study focus was on probing the information needs and seeking behavior of Science and Technology faculty of the University of the Punjab Pakistan. Using a structured questionnaire, the study explored the preferences of the faculty members regarding the significance of formal and informal information sources. Findings of the study showed that traditional and e-information resources play an important role in fulfilling faculty information needs. The study further reported that easy access to electronic resources has reduced the number of respondents' visits to seminar as well as main libraries; and that the faculty members spent much of their time on searching online sources than traditional sources.

Objectives of the study

Following are the major objectives of the study:

1. To know about the major information sources and services used by faculty members of Sindh University while conducting research.
2. To investigate whether any significant difference exists between male and female faculty members in using information sources.
3. To investigate the criteria used by the faculty members in evaluating information resources.
4. To determine if there is a significant relationship between research output and age of the respondents.

Methodology

Population of the study consists of all 537 permanent/regular faculty members of Sindh University Jamshoro. The study used simple cluster sampling technique with equal percentage of representation from all eight faculties selecting 42% faculty members from each faculty. A questionnaire used by Popoola

(2008), Agba, Kingongo, and Nyumba (2004) and Shokeen and Kaushik (2002) was adopted with some modification for data collection. The questionnaire with a Cronbach's alpha reliability coefficient ($\alpha=0.81$) was utilized on a total sample of 226 faculty members of the Sindh University Jamshoro, Sindh, Pakistan, out of which 190 responded positively with a response rate of 84.07%. Details of total population, sample taken and response rate are given below.

Table 1. Population, Sample Size and Response Rate ($n=190$)

Sr#	Name of faculty	Number of faculty members	Sample size	Number of respondents (response rate)
1	Faculty of Arts	60	25	20 (80%)
2	Faculty of Commerce and Business Administration	40	17	13 (76.47%)
3	Faculty of Education	26	11	7 (63.63%)
4	Faculty of Islamic Studies	12	5	4 (80%)
5	Faculty of Law	6	3	2 (66.66%)
6	Faculty of Natural Sciences	250	105	95 (90.47%)
7	Faculty of Pharmacy	21	9	7 (77.77%)
8	Faculty of Social Sciences	122	51	42 (82.35%)
	Total	537	226	190 (84.07)

Results

Demographic Characteristics

As shown in Table 2, male constituted majority of the respondents (80%) as against females who constituted 20% of the total respondents. This low number of female faculty is due to the fact that female teachers constitute a total of 25 percent of the total population in the University of Sindh. About 40% of the faculty members were in the age range of 25-35 years, 35.78% were those whose ages were between 36-46 years whereas, 24.21% of the respondents were those who were 47 to 60 years of age. Of the 190 total respondents, 55.26% held MA/M. Phil degrees while 44.73% had Ph. D or Post Ph. D qualification. As far as respondents' length of service, it was found that 48.42% of faculty members had a total of 1-15 years length of service, 40% had 16-30 years while 11.57% had an experience of 31 years or more. Of the total respondents, 10.52% were professors, 17.89% were Associate Professors, 27.36% were Assistant Professors whereas 44.21% of the respondents were Lecturers.

Table 2. Demographic Characteristics of Respondents

Variables	Number of respondents	%
Gender		
Male	152	80
Female	38	20
Age		
25-35	76	40
36-46	68	35.78
47-60	46	24.21
Highest academic degree		
Masters /M. Phil	105	55.26
Ph. D/Post Ph. D	85	44.73
Length of Service		

1-15 years	92	48.42
16-30 years	76	40
31 years or more	22	11.57
Designation of Respondents		
Professors	20	10.52
Associate Professor	34	17.89
Assistant Professor	52	27.36
Lecturer	84	44.21

Use of Information Sources by the Respondents

In order to know about the information sources used more heavily by the respondents, and to meet objective one of this study, a five point Likert scale ranging from “very heavily used” to “never used” was utilized. As shown in Table 3, It was found that scholarly journals ranked first with a mean score of 4.88, Abstract and indices (mean: 4.86) ranked second while textbooks (mean: 4.82) ranked third. The least used sources of information were found to be statistical publications (mean: 1.98), Radio/TV and Conference papers with mean score of 2.92 and 2.90 respectively. Most of these findings are in line with the findings of Popoola (2008), Copper (1998), Bright (1998) and Brown (1999) who reported that Scholarly journals and abstracts are used more often by most of the researchers while conducting research.

Table 3. Use of Information Sources by the Respondents

Rank	Sources of information	Mean	St. Deviation	Variance
1	Scholarly Journals	4.88	0.92	0.77
2	Abstracts/Indices	4.86	0.98	0.64
3	Textbooks	4.82	0.85	0.55
4	Internet/databases	4.42	0.66	0.58
5	Reference books	4.42	0.92	0.37
6	Theses/dissertations	3.98	0.80	0.86
7	Govt. Publications	3.67	0.43	0.88
8	Co-Workers/Colleagues	3.05	0.98	0.26
9	Conference papers	2.90	0.50	0.18
10	Radio/TV	2.92	0.48	0.18
11	Statistical publications	1.98	0.26	0.06

In order to know about the significant difference between male and female respondents’ use of information sources, Z test was conducted. As shown in Table 4, the mean scores of male respondents’ use of information sources was found to be 17.8 whereas for females it remained 16.7. The z-test showed no significant difference ($z=1.66, p> 0.06$). This confirms the findings of Chin, Gupta and Hoshower (2006) who argued that there is no relationship between research productivity and gender. However, Atinmo and Jimba (2002) discovered that male faculty members publish more than their female counterparts.

Table 4. Use of Information Sources by Gender, Test of Significance

Gender	Number of respondents	Mean	SD	Z	Significance
Male	152	17.8	7.6		
				1.66	0.06
Female	38	16.7	6.8		

Journals Read Regularly by Discipline

As shown in Table 5, journals related to social sciences were read most, followed by journals in the field of Natural Sciences with mean scores of 5.00 and 4.96 respectively. This high rate of journals' use by the faculty members of social sciences and natural sciences is probably due to the fact that Natural Scientists and social scientists generally find journals indispensable for teaching, learning and research. On the other hand journals related to the fields of Arts and Humanities and religion including Islamic Studies were read least with mean scores of 2.42 and 2.65 respectively.

Table 5. Journals Read Regularly by Subject/Discipline

Rank	Subject/discipline	Mean	SD	Variance
1	Social Science journals	5.00	0.26	0.06
2	Natural Science journals	4.96	0.16	0.08
3	Religion/Islamic Studies journals	2.65	0.67	0.04
4	Arts and Humanities journals	2.42	0.44	0.04

Use of Information Services

Respondents were asked to provide information about the services they use for their research work while using their university libraries. They were asked to tick one or more out of the ten services provided. The respondents were also asked to rate the given information services on a five point Likert scale ranging from "very heavily used" to "never used". As shown in Table 6, respondents used internet services (mean: 4.92), reference services (mean: 4.92) and reprographic services (mean: 4.90) very heavily. Whereas, indexing, abstracting, microfilming, databases, and newspaper clippings were used very seldom by the respondents. The above findings corroborate the findings of Wang, M. L. (2010) who argued that a majority of faculty members never or seldom used indexing and abstracting, microfilms, library catalogues for their information needs. He also reported that faculty preferred to use the internet for their research needs.

Table 6. Use of Information Services by the Respondents

Rank	Information services	Mean	St. deviation	Variance
1	Internet services	4.92	0.88	0.73
2	Reference Services	4.92	0.76	0.64
3	Reprographic services	4.90	0.67	0.51
4	Current awareness services	3.88	0.66	0.51
5	Document delivery	3.36	0.66	0.48
6	Alert services through SMS/Email	3.20	0.59	0.40
7	Indexing and abstracting services	2.11	0.48	0.37
8	Newspaper clippings	2.00	0.38	0.22
9	Databases	1.78	0.56	0.11
10	Microfilming	1.45	0.18	0.02

Information Evaluation Criteria

To know how faculty members evaluate information for their research purposes, they were asked to tick one or more out of ten criteria given. As indicated in Table 7, respondents evaluated information on the bases of accuracy, purpose and currency of information. Whereas they gave least importance to the interactivity with websites, authority of publisher and relevance of information while evaluating their required stuff for teaching, learning and research.

Table 7. Respondents' Information Evaluation Criteria

Rank	Criteria	No. of respondent who used the criteria	%
1	Accuracy of information	177	93.15
2	Purpose	145	76.31
3	Currency of information	141	74.21
4	Coverage of topic	120	63.15
5	Convenience in obtaining information	105	55.26
6	Objectivity of publisher	85	44.73
7	Cost of obtaining information	79	41.57
8	Relevance	74	38.94
9	Authority of publisher	51	26.84
10	Interactivity with websites	38	20

Research Output of the Respondents

Analysis of research output by type of publication of the respondents in the last five years showed that journal articles was the major form of publication of faculty members which ranked 1st followed by books, followed by book chapters with mean scores of 9.0, 5.0, 7.0, 6.0 and 5.0 respectively. Whereas technical reports ranked last with a mean score of 5.0 which showed that it was the least preferred form of publication by majority of the respondents. Table-8 give more details.

Table 8. Research Output of Respondents

Rank	Publication type	No. of respondents	Mean	SD
1	Journal articles	188	9.0	3.11
2	Books	76	7.0	1.23
3	Book chapters	61	6.0	1.12
4	Conference proceedings	54	5.0	1.34
5	Technical reports	41	5.0	0.37
Total			6.4	1.43

Relationship between Age and Research Output of Faculty Members

To analyze the relationship between age and research output of respondents, test of significance was conducted as given in Table 9. The data analysis showed that respondents mean age was 33.33. A high negative relationship was found between the respondents age and research output ($r=-0.62$, $p<0.02$). Thus, the higher the age, the lower the research output.

Table 9. Relationship between Age and Research Output

Variable	No. of respondents	Mean	SD	Df	r	P value
Age	190	33.33	7.32			
				2.55	-0.62	0.31
Research output	190	6.2	1.10			

Discussion

The findings of this study show that faculty members used scholarly journals, abstracts and indices more heavily for their research needs while statistical publications, conference papers and radio/TV were used very seldom. The results relating to gender wise use of information sources by faculty members

revealed that there existed no significant difference in their use of information sources ($z=1.66$, $p> 0.06$). Similar findings were also reported by Popoola (2008), Copper (1998) and Bright (1998) who argued that Scholarly journals and abstracts were used more often by majority of the researchers while conducting research. The social science research journals were read most followed by journals related to the discipline of natural sciences. This high use is probably due to the fact that natural scientists and social scientists generally find journals indispensable for teaching, learning and research. On the other hand journals related to the fields of Arts and Humanities and religion including Islamic Studies were read less. As regard age and research output, the study revealed that young researchers produced more research articles than the older faculty. Since younger faculty needs research publications to their names for further progression while older faculty normally have produced a number of publications previously and are usually on high positions, therefore the older faculty take little or no interest in conducting further research as compared to the younger faculty.

The results of the study showed that among the various services offered by the university libraries, such as online services, databases, microfilming, newspaper clipping services, document delivery, alert services and reprographic services, faculty members had more undemanding and convenient access to the Internet and their access to other services was really hard and limited. These findings were also confirmed by Azubogu and Madu (2007) and Omotayo (2010) who argued that Academics in developing countries are fast adapting to the Internet as a source of information for teaching and research. Hence, they preferred to use the internet or online services offered by their respective libraries. The availability of these services in libraries has positively influenced research productivity of faculty members. Momani (2003), Okiki (2013) and Aldojan (2007) have also confirmed that the internet services were used more heavily by the faculty members and was found more convenient to them while searching for information in most of the disciplines.

Information evaluation is one of the most important thing in the research cycle. Faculty members used various methods to evaluate information in order to determine their authenticity and credibility. Results of this study showed that the respondents evaluated information on the bases of accuracy, purpose and currency of information. Whereas they gave least importance to the interactivity with websites, authority of publisher and relevance of information while evaluating their required stuff for teaching, learning and research. Similar finding have also been reported by Sillence et al (2007) who found that social science and medical researchers evaluate information on the bases of their accuracy and currency.

The responsibility of the academics goes beyond teaching in the classroom, but to research and publish articles that will support the growth of the economy. The world expects the academics to come up with solutions to present and impending challenges through their research. Therefore, efforts should be geared toward realizing access to electronic information resources so that it can be used maximally to achieve better research outputs.

Conclusion

The study investigated the utilization of information resources and services and its impact on the research output of university faculty with reference to the University of Sindh. From the analysis of data, it was revealed that faculty members used scholarly journals, abstracts and indices more than other resources. Most of the researchers preferred to use online resources and services for their research needs. Journals related to the field of social sciences and natural sciences were read most by the faculty members. This high rate of journals' use by the faculty members of social sciences and natural sciences is probably due to the fact that Natural Scientists and social scientists generally find journals indispensable for teaching, learning and research. Faculty members evaluated information on the bases of accuracy, purpose and currency of information. Whereas they gave least importance to the interactivity with websites, authority of publisher and relevance of information while evaluating their required stuff for teaching, learning and research. The study revealed that young researchers produced more research articles than the older faculty. Since younger faculty needs research publications to their names for further progression while older faculty normally have produced a number of publications previously and are usually on high positions, therefore the older faculty take little or no interest in conducting further research as compared to the younger faculty. For the findings

of this study, the respondents showed that the use of information resources and services have played an effective role in conducting research. Information resources, especially, online resources have positively impacted research output of university faculty members to a greater extent. For the last two decades or so, the availability of online full text journals, books and other resources have fostered the research and academic activities in developing countries. These resources and services have improved the cooperative research skills and helped them to communicate with other faculty and researchers easier.

Access to e-resources is positively associated with research productivity. The more we invest on university and research libraries, the university faculty and research scholars get huge benefit from it. Thus there is a positive co-relation with between the awareness and e-resources and services and research output of the faculty. Access to standard information resources and services not only help enhance the research output among the university faculty but also put a positive impact on the economic growth and technological development of a country.

Recommendations

Based on the research findings and conclusions drawn, it is recommended that libraries and universities should devise a formula to ensure reasonable budget allocation to electronic and non-electronic information resources (journal subscriptions) to ensure sustainability of access to such resources. Secondly, libraries, in collaboration with the end-users design marketing strategies that work to increase awareness and eventually usage of the electronic information resources. Thirdly, libraries in collaboration with end users should design and implement information literacy programs that are effective, for example, training materials that are content/subject specific. Finally, libraries, and universities in general, should ensure that adoption of change is mainstreamed in their strategic plans to create a technologically comfortable working environment (including provision of supportive services) that recognizes the extra workload as perceived by the staff through incentives.

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