

Impact of Information Resources and Services on the Research Output of University Faculty: A Case Study of the University of Peshawar, Pakistan

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Abstract

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

Design/methodology/approach: Population of the study consists of all 398 permanent/regular faculty members of the University of Peshawar. The study used simple cluster sampling technique with equal percentage of representation from all six faculties selecting 45% subjects from each faculty. Descriptive survey research design was adopted. For data collection, a questionnaire was prepared using similar studies with some modification. The questionnaire with a cronbach alpha reliability coefficient ($\alpha=0.82$) was utilized on a total sample of 180 faculty members of the University of Peshawar, Pakistan, out of which 160 responded positively with a response rate of 91.66%.

Research limitation(s): The study is limited to the University of Peshawar, Khyber Pakhtunkhwa, covering all its six faculties. It does not include constituent colleges of the University of Peshawar.

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. Journals related to Numerical and Physical Sciences were read most, followed by journals in the field Life and Environmental 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 currency, coverage and accuracy 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.

Contribution to knowledge: The findings of this study are useful in building a holistic model of information resources and services that could meet the research needs of the faculty members effectively.

Practical implication(s): The findings of this study are useful in understanding the utilization of information resources and their impact on the research output of faculty members of Pakistani universities in general and University of Peshawar 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.

Paper type: Research.

Keyword(s): Information use; Information resources; Information services; Information literacy; Research output; University of Peshawar; Pakistan.

Introduction

Accessibility and utilization of information sources are indispensable to the teaching, research and administrative activities of the faculty members in any university system. The measure of academic success in academia is research productivity which requires information resources. The universities and other higher educational institutions set up libraries to make information resources available to assist academic staff members in their research quest (Okiki, 2013). In universities, research productivity play a vital part in achieving success since it is directly associated to job promotion and salary (Bloedel, 2001). Researchers (e.g. Popoola, 2008) 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.

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 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.

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It is expected that an information literate person may feel more comfortable in doing his research. 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 the availability, exploitability and access of resources. 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.

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 University of Peshawar, Pakistan. The University of Peshawar, the oldest University of the Khyber Pakhtunkhwa, Pakistan, was established 1950. It has eight faculties comprising of 46 postgraduate departments and institutes with a total faculty of 600. Moreover, it has four constituent colleges and two secondary schools. 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 University of Peshawar 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

Many researchers have studied the information needs of teachers of various universities in Pakistan and elsewhere. For example, research studies conducted by Ekhikhamenor (1990), and Jam (1991/1992) have established that the information necessities of university teachers are mostly work-related, especially to teaching and research which has been constantly highlighted in several studies. Several researchers (e.g. Bigdeli, 2007; Tahira & Amin, 2009) found that information needs fluctuate as per the area of specialty of individual faculty.

Studies have reported that majority of the social science faculty used resources of their libraries on daily bases. Faculty members preferred to search information through indexing and abstracting periodicals. They also found that social science faculty mostly used current journals more frequently followed by recently published books. Similarly, the findings of Omeluzor et al. (2012) revealed that most of the university teachers knew and used electronic resources more frequently for research pursuits. Their 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. With the huge growth of data produced every day, effective information retrieval methods are required for easy access to information, particularly among academics at universities. The e-resources and digital databases have an important role in the organization of and easy retrieval of information, which has a positive impact on the quality and quantity of research output for academics.

Rafiq and Amin (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 their study on information seeking habits of education faculty, Serrano and Robbins (2013) found that faculty members took keen interest in electronic access to scholarly journals and monographs 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 Oduwale (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, 8.82% 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) studied the information needs of teachers of the University of the Punjab, Pakistan. The study focus was on probing the information needs and seeking behavior of Science faculty. Using a structured questionnaire, the study explored the preferences of the faculty members regarding the significance of formal and informal information sources. The study reported that traditional and e-information resources play significant role in fulfilling faculty information needs. The study further reported that easy access to electronic resources has reduced respondents' visits to seminar as well as main libraries; and that the faculty members use online resources more than traditional sources.

Study Objectives

The major objectives of this study are to:

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

Research Questions

1. What major sources and services are used by the faculty members of the University of Peshawar while conducting research?
2. What criteria is adopted by the faculty in evaluating information resources?
3. Is there any significant difference exist between male and female faculty members in using information sources?
4. Is there exist any significant relationship between research output and age of the respondents?

Limitations and Delimitations of the Study

The study is limited to the University of Peshawar, Khyber Pakhtunkhwa, covering all its six faculties. It does not include non-permanent faculty and the faculty of constituent colleges of the University of Peshawar.

Methodology

Population of the study consists of all 398 permanent/regular faculty members of the postgraduate departments of the University of Peshawar. The study used simple cluster sampling technique with equal percentage of representation from all six faculties selecting 45% 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 alpha reliability coefficient ($\alpha=0.82$) was utilized on a total sample of 180 faculty members of the University of Peshawar, Pakistan, out of which 165 responded positively with a response rate of 91.66%. Details of total population, sample taken and response rate are given in Table 1 below:

Table 1. Population, Sample Size and Response Rate (n=180)

Name of faculty	# of faculty members	Sample size	# of respondents (response rate)
Arts and Humanities	40	18	16 (88.88%)
Life and Environmental Science	91	41	39 (95.12%)
Management and Information Sciences	45	21	18 (85.71%)
Islamic and Oriental Studies	40	18	15 (83.33%)
Numerical and Physical Sciences	62	28	26 (92.85%)
Social Sciences	120	54	51 (94.44%)
Total	398	180	165 (91.66%)

Results and Discussion

Demographic Characteristics of the Sample

As shown in Table 2, male constituted majority of the respondents (66.66%) while females constituted 33.33% of the total respondents. About 30% of the faculty members were in the age range of 25-35 years, 36.36% were those whose ages were between 36-46 years whereas, 33.33 were those who were 47 to 60 years of age. Of the total respondents, 35.15% held MA/MPhil degrees while 64.84 had PhD or Post-PhD qualification. As far as respondents' length of service, it was found that 37.57% of faculty members had a total of 1-15 years length of service, 43.63% had 16-30 years, while 18.78% had an experience of 31 years or more. Of the total respondents, 10.90% were professors, 13.33% were associate professors, and 36% were assistant professors whereas 39.39% of the respondents were lecturers.

Table 2. Demographic Characteristics of the Respondents (n=180)

Variable	Characteristic	# of respondents	%
Gender	Male	110	66.66
	Female	55	33.33
Age	25-35	50	30.30
	36-46	60	36.36
	47-60	55	33.33
Highest academic degree	Masters/MPhil	58	35.15
	Ph. D/Post PhD	107	64.84
Length of service	1-15 years	62	37.57
	16-30 years	72	43.63
	31 years and more	31	18.78
Designation	Professors	18	10.90
	Associate professors	22	13.33
	Assistant professors	60	36.36
	Lecturers	65	39.39

Use of Information Sources by the Respondents

To know about the information sources used more heavily by the study participants, a five point Likert-type 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 4.90 Abstract and indices (mean: 4.72) ranked second while Internet/databases (mean: 4.65) ranked third. The least used sources of information were found to be Radio/TV (mean: 1.88), Co-workers/Colleagues and Statistical publications with mean scores of 2.42 and 2.88 respectively. Most of these findings corroborate 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 (n=180)

Rank	Source of information	Mean	St. deviation	Variance
1	Scholarly journals	4.90	0.89	0.73
2	Abstracts/indices	4.72	0.92	0.61
3	Internet/databases	4.65	0.72	0.57
4	Theses/dissertations	4.58	0.55	0.77
5	Reference books	4.51	0.86	0.46
6	Textbooks	3.76	0.78	0.76
7	Social media	3.72	0.82	0.64
8	Govt. publications	3.70	0.54	0.79
9	Conference papers	3.36	0.99	0.34
10	Statistical publications	2.88	0.62	0.26
11	Co-workers/colleagues	2.42	0.56	0.20
12	Radio/TV	1.88	0.36	0.18

Scale: 1: Very heavily used to 4: Never used.

In order to know about the significant difference between male and females' 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 16.72 whereas for females it remained 14.22. The z-test showed no significant difference ($z=1.72$, $p>0.07$). 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	# of respondents	Mean	SD	Z	Sig.
Male	110	16.72	8.7	1.72	0.07
Female	55	14.22	7.8		

Journals Read Regularly by Discipline

As shown in Table 5, journals related to Numerical and Physical Sciences were read most, followed by journals in the field Life and Environmental Sciences with mean scores of 4.98 and 4.86 respectively. This high rate of journals' use by the faculty members of Numerical and Physical Sciences and Life and Environmental Sciences is probably due to the fact that the scientists of such disciplines generally need high quality journals indispensable for teaching, research. Moreover, there are many more journals in the fields of physical Sciences, Life Science, and Environmental sciences as compare to other disciplines. This high number of journals give them the opportunity to read a variety of journals. On the other hand journals related to the fields of Religion and Arts and Humanities were read least with mean scores of 2.96 and 2.98 respectively.

Table 5. Journals Read Regularly by Discipline

Rank	Journal read by subject/discipline	Mean	SD	Variance
1	Numerical and physical sciences	4.98	0.66	0.07
2	Life and environmental science	4.86	0.38	0.06
3	Social sciences	4.66	0.55	0.05

4	Management and information sciences	3.72	0.26	0.06
5	Arts and humanities	2.98	0.52	0.04
6	Islamic and oriental studies	2.96	0.64	0.04

Use of Information Services

The study participants were asked to provide information about the services offered to them by their respective 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-type scale ranging from “very heavily used” to “never used”. As shown in Table 6, respondents used internet services (mean: 4.88), reprographic services (mean: 4.86) and reference services (mean: 4.64) very heavily. Whereas, microfilming, newspaper clippings, alert services and abstracting services were used very seldom by the respondents. The above findings corroborate the findings of Wang (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 Respondents

Rank	Information Service	Mean	SD	Variance
1	Internet services	4.88	0.76	0.68
2	Reprographic services	4.86	0.78	0.62
3	Reference services	4.64	0.42	0.58
4	Databases	3.59	0.44	0.51
5	Document delivery	3.42	0.42	0.66
6	Current awareness services	3.39	0.66	0.45
7	Abstracting services	2.30	0.55	0.48
8	Alert services through SMS/email	2.28	0.46	0.48
9	Newspaper clippings	1.90	0.48	0.29
10	Microfilming	1.21	0.20	0.04

Information Evaluation Criteria

To know how faculty members evaluate information for their research, 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 currency, coverage, accuracy, purpose and convenience. 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 (N=152)

Rank	Criteria	# of criteria users	%
1	Currency of information	148	97.36
2	Coverage of topic	142	93.42
3	Accuracy of information	136	89.47
4	Purpose	136	89.47

5	Convenience in obtaining information	120	78.94
6	Objectivity of publisher	96	63.15
7	Cost of obtaining information	88	57.89
8	Relevance	64	42.10
9	Authority of publisher	41	26.97
10	Interactivity with websites	20	13.15

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 were the major forms of publications of faculty members which ranked 1st followed by books, followed by conference proceedings with mean scores of 8.0, 6.0, 6.0, 5.0 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 gives more details.

Table 8. Research Output of the Respondents

Rank	Publication	# of respondents	Mean	SD
1	Journal articles	164	8.0	3.42
2	Books	62	6.0	1.68
3	Conference papers	60	6.0	1.34
4	Book chapters	40	5.0	1.50
5	Technical reports	38	5.0	0.31

Relationship between Age and Research Output of Faculty Members

As given in Table 9, test of significant was conducted in order to analyze the relationship between age and research output of the respondents. The data analysis showed that respondents mean age was 34.42. A high negative relationship was found between the respondents age and research output $r=-0.74$, $p<0.02$). Thus, the higher the age, the lower the research output.

Table 9. Relationship Between Age and Research Output of the Respondents

Variable	# of respondents	Mean	SD	df	Z	Sig.
Age	164	34.42	7.58	2.55	0.74	0.02
Research output	164	6.2	1.22			

Conclusion

The findings of this study show that faculty members used scholarly journals, abstracts and indices and the internet more heavily for their research needs while statistical publications, conference papers and radio/TV were used rarely. Journals related to numerical and physical sciences were read most, followed by journals in the field life and environmental sciences. This high use is probably due to the fact that there are more high impact factor journals available in these fields as compared to social sciences, arts and humanities. On the other hand journals related to the fields of religion, and arts and humanities were read least.

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 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. 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. Thus the study 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 currency, coverage and accuracy of information, whereas, they gave least importance to the interactivity with websites, authority of publisher and relevance of information.

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.

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. University library administrations should consult faculty members from different disciplines in the process of selecting electronic databases in accordance with their scientific and research needs, taking into account the balance between databases of different scientific disciplines

Secondly, libraries, in collaboration with the end-users should 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. Moreover, University libraries in Pakistan should intensify efforts towards continues user orientation programs for the faculty members. This will not only sharpen their library use capabilities but will also create awareness on the availability of resources in libraries for their research pursuits.

Fourthly, in order to enhance the faculty members' research output, ICT infrastructure in universities must be upgraded and faculty members use the online technology with increasing network bandwidth. But in order to encourage faculty members to use the subscribed databases more, it is suggested the training workshops would be held for the faculty members emphasizing the internet expertise to make them more familiar with database centers and use them. 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

Future Research Directions

The findings of this study 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. Moreover, findings of this study will also help LIS researchers to dig out more research problems relating to collection development, information resources and services, role of ICTs in university libraries, role of academic libraries in faculty's research output and adoption of new technologies by university libraries for the capacity building of students and faculty.

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