The Barriers to Producing High Quality Library and Information Science Research in Developing Countries: The Case of Pakistan

KANWAL AMEEN

It is generally recognized that in many developing countries, for a variety of reasons, research output in most disciplines lags behind that in the developed nations. Among the reasons is a range of factors that may hinder good-quality research outputs. This paper focuses on the matter of research quality in library and information science (LIS) in Pakistan as a case study. To test the types of barriers that the researcher believes hinder the production of quality research in Pakistan, a web-based survey was conducted using a questionnaire consisting of structured and open-ended questions. The questionnaire was based on a set of barriers to quality research production, which were identified from the literature. The respondents were asked to indicate their views on the impact of these barriers on the production of quality research. The data was analysed using SPSS. The findings reveal that the lack of critical thinking, a poor research culture, lack of encouragement of research, and inadequate imparting of research skills in LIS education are the most significant barriers. The study suggests that determining the order in which to tackle these barriers will facilitate the production of high-quality research in countries like Pakistan.

Keywords: research quality, developing countries, publishing barriers, library and information science research, research, Pakistan

BACKGROUND TO THE STUDY

It is generally accepted that research is vital for generating knowledge, for the development of professions, and for the development of individuals and nations. This is especially the case in developing countries like Pakistan and in applied disciplines such as library and information science (LIS).

Rather than entering the debate about how to define 'high-quality research,' this paper adopts the simple standard of defining high-quality research as that published in LIS journals listed in ISI's *Journal Citation Reports* (*JCR*). This will prove contentious among many colleagues, but it at least gives a simple standard of 'quality.' The concept of impact factor (IF) was proposed by Garfield to measure the quality of articles and journals. It measures the popularity of individual journals and is defined as the ratio of the number of citations in the last two years of the papers published by a journal to the number of papers published in the last two years by that journal. The higher the IF is for a journal, the more popular it is.[1]

Over the years, the author has observed as a journal editor, a research supervisor, and a researcher that quality research remains elusive in most developing countries. This perspective is not unique; others have criticized the quality of what passes for 'research.' Among them are Hernon and Schwartz,[2] and Hernon, Smith, and Coxen[3]; all have criticized the quality of research and called for higher standards in research reporting. They have been speaking from a northern-hemisphere, developed-country perspective; this study addresses the same issues from a developing country's perspective, where the infrastructural problems are hindering most aspects of scholarship.

The review of literature from other developing countries also reveals concern regarding the quality of research being produced in these countries.[4] Nevertheless, the reasons behind this weakness have not been addressed in the literature. Only Mohammed, from the Nigerian perspective, reports the factors inhibiting the advancement of research .[5] It appears that this probe should also be made in other developing countries. This study takes Pakistan as a case to find the type of barriers to producing high-quality research.

Problem statement

The focus of the Higher Education Commission (HEC) of Pakistan is on raising the quantity and quality of research in Pakistani universities, and it has taken special measures under its quality-assurance initiatives to effect this. Hence, awareness of quality control has generally grown in every field of higher education in Pakistan. Better promotion opportunities are available for the faculty members whose papers appear in international journals, particularly in journals included in *JCR*. PhD theses must be evaluated by the technically advanced countries' experts.

A zero-tolerance policy for plagiarism has been implemented. Research students have to submit a certificate of original work along with a Turnitin report verifying that no plagiarism has been committed. Still, the research output from Pakistan at the international level in the areas of the humanities and the social sciences is minimal. Hence, investigating the barriers to producing better quality research in Pakistan seems important. Though the study addresses the issue in the context of library and information science, the findings may also be applicable or of interest to other social scientists. Despite a focus on the Pakistani situation, it is hoped that the study will be a valuable addition to the international literature on the subject and of interest to other developing countries as well.

LITERATURE REVIEW

An adequate corpus of literature on the subject with specific reference to developing countries is not available. In general terms, the review has revealed that in LIS, quality research production remains a challenge in both developed and developing countries. For example, O'Connor and Park state that the volume of research needed to address the range of technologies, issues, and services facing us may overwhelm our capacity to respond; related issues, such as the quality of the research, will continue to be a concern.[6]

Regarding the situation in developing countries, a dated yet relevant work by Zakari Mohammed highlights the factors that inhibit the advancement of LIS research in Nigeria. The barriers identified by the author, such as the poor dissemination of research findings, lack of cross-disciplinary research collaboration, academic and professional ineptitude, inadequate funding, social indifference to research, and inefficient use of the knowledge and skills gained from doing research still appear to be common among most of the developing world.[7]

Satija reports from India that the number of PhD programs have rather mushroomed despite the lack of facilities or adherence to standards.[8] Haider and Mahmood investigated the perspective of doctoral-level research in Pakistan. They report that research topics do not address real-world problems and that the absence of proper guidance generally results in theses and dissertations of weak quality.[9]

Despite the period of its coverage (1980–1999), the 2002 study by Uzun is worth noting for its insights into the nature of articles with either principal or co-authors and the former socialist Eastern European countries (EECs). It was found after analysis of twenty-one LIS core journals

from 1980 to 1999 indexed in the Social Science Citation Index (SSCI) database that only 826 (7.9 per cent) of a total of 10,400 published articles were from developing countries (DCs) or countries in the former communist bloc in Eastern Europe. The number of articles with authors from China, Saudi Arabia, Turkey, Botswana, Ghana, Kuwait, and Taiwan increased considerably during the period investigated, and those with authors from India, Nigeria, Pakistan, and Brazil decreased. Co-word analysis of these authors' articles (based on the keywords and thematic noun phrases in the titles and abstracts of a sample of 102 articles published between 1996 and 1999) indicated that bibliometrics was the most frequent topic in LIS research in major DCs and EECs. Information retrieval, information need, and information use were among the topics of relatively high interest for the researchers working in DCs in Asia and Africa.[10] According to Kousar and Mahmood, addressing the area of bibliometrics is just a recent trend in Pakistan.[11]

A study by Chang reports that information science research in Asia has moved toward internationalization and that Asian researchers have made significant contributions to global information science research with their information-technology-related backgrounds.[12] He and Wang analysed the research activity in Chinese LIS from 1975 to 2004. Their analysis, based on the Social Sciences Citation Index, shows both an increase in the number of papers and an improvement in the quality of publishing channels. The study revealed a growing trend of collaborative writing, as about half of the papers from China were completed through either international or domestic collaborations. The trend has had a positive impact on publishing. All collaborative papers were published through better-quality channels and higher-impact journals compared to non-collaborative papers. Most Chinese LIS collaborations were with co-authors in North America and Europe.[13]

Johnson and Cano probed 127 library schools and 312 serial publications — from journals to newsletters — in librarianship and information science in Latin America. Their study identified a lack of quality control and haphazard publication programs as the weaknesses in the scholarly publication process for library and information science in Latin America. The study urged the editors of Latin American journals to review their policies on quality control and adopt peer review and other quality-control methods.[14]

Klobasa and Clydec's study explored beliefs, attitudes, and perceptions about research and practice in school librarianship in Australia using the

theory of planned behaviour as a theoretical framework. The survey was conducted to identify beliefs about publishing in the field, attitudes to research and publication, perceived social norms and social influences on research and publication, and perceived barriers to research and publication. The results revealed that LIS practitioners were less confident than faculty members about their ability to conduct and write up research. It also established that, in contrast to full professors, the researchers and practitioners depended on the encouragement of peers and supervisors or senior colleagues as an important social influence on their research and publication. The researchers and practitioners also perceived the lack of time, funds, and support for research as barriers to the production of quality research. Practitioners differ from researchers in having less confidence in their skills and expertise to do research.[15]

A note on the Pakistani scenario

Library education was started in the territory of Pakistan in 1915 by Asa Don Dickenson, who created a certificate course on 'Library Science' at the University of the Punjab. It was the first university outside the United States to offer education on this subject area. After Pakistan's creation in 1947, the program was discontinued for a couple of years. The certificate course was upgraded into a one-year post-graduate Diploma in Library Science (LS) program in 1959, and a master's degree (MLS) program was started in 1974. The Karachi University was the second university to start a program in library education, but it was the first one to offer a post-graduate Diploma in LS in 1956, and an MLS program, in 1962. Its master's program was the highest available LS education in Pakistan until the early 1970s. Presently, eight library schools in public-sector universities, and three in the private sector, offer a master's degree in LIS. A full, compulsory course on research methods is part of the curriculum in all schools. However, it only touches the basics of various research methods. Ameen found that the quality of contents and the overall standard varies across all schools.[16]

Usmani writes that the trend of acquiring advanced degrees in LS started in 1960. However, only thirteen librarians of Pakistani origin received a PhD by the 1980s. Among those, only one got it from a Pakistani university (Karachi University); it is also important to note that Karachi University started its thesis-based PhD program in 1967. The majority of those thirteen PhD holders either found employment in the Middle East and other developed countries or joined Pakistani institutions before

leaving for abroad after a short time. Only a few stayed in the country. Hence, LIS research output remained minimal at the international and national level due to 'brain drain' during that period.[17] The literature review establishes that the research production remained low from 1947 to the end of the twentieth century. Uzun also confirmed that the number of research articles produced in Pakistan from 1980 to 1999 was less than the number produced in the preceding twenty years.[18] It needs to be mentioned here that one of the major reasons for the decreasing number of articles from Pakistan during the 1980s to 1990s was the migration of the senior or PhD faculty members from the country. Their work continued to appear, but it was being done from the countries to which they had moved.

Samdani and Bhatti shed light on the recent doctoral-level research in LIS by Pakistani professionals. They report that twenty-eight Pakistanis have been awarded PhD degrees by 2010; nineteen were from foreign universities and nine were from Pakistan. The authors declared this situation unsatisfactory.[19] Since the dawn of the twenty-first century, there has been a significant increase in the research output from Pakistan. The University of the Punjab (PU) produced three more PhDs in 2011 under its regular coursework and thesis-based 'MPhil Leading to PhD' program, which had started in 2005. This is the first regular LIS research degree program in Pakistan. Presently, four other public-sector universities have started MPhil/PhD degree programs with varying criteria for admission.

The PU's LIS school is strictly following the criteria set by the HEC to start and execute post-graduate research degree programs. Meeting the required standards has helped the PU school to maintain research output in terms of both quantity and quality. So far, three PhDs and eighteen MPhil scholars have completed their programs. Since 2005, the number of papers published in the foreign, peered-reviewed, and *JCR*-listed journals has increased. Mahmood and Shafiq note that research activities have been rapidly increasing in the LIS field in Pakistan, yet a wide gap between demand and supply of LIS professionals with research degrees exists.[20] To tap this need, a private university has just started an MPhil program. Despite not hiring a single permanent faculty, it has admitted more students than any other school. The HEC gives accreditation to a university as a whole; hence, the quality of individual academic programs must be upheld by the university, which is not always attentive to the issues of individual programs. Further investigation after

some time should be made to find out the impact of all these trends on program quality.

The literature has revealed that the quality of research is an issue, both in the developed and developing countries. It also appears that only a few studies have addressed the problem from the perspective of developing countries. Therefore, the present study is an attempt to begin filling some of gaps in the literature on this subject.

RESEARCH DESIGN AND IMPLEMENTATION

The questionnaire

To achieve the aims of the study, a web-based questionnaire was designed. Initially, questions were designed on the basis of what the extant literature indicated might be potential barriers to quality research. The literature from developed countries was used to produce the initial list because the quality indicators are the same for the developing countries. Then these potential barriers were discussed with experienced researcher colleagues, resulting in additional barriers that reflect the context of developing countries. Finally, input was sought from MPhil and PhD students studying LIS at the University of the Punjab in Lahore, which is the leading LIS school offering regular research degree programs based on course work and dissertation writing. This input resulted in further additions in the instrument.

The questionnaire had three major parts:

1. Basic demographic information to reflect respondents' professional status
2. Rating of factors hindering the production of quality research in Pakistan (a four-point Likert scale was used to capture responses)
3. Suggestions for improvements in the situation (elicited through open-ended questions)

Sampling

Purposive sampling, with some convenience sampling, was used. First, well-known academics and researchers from Pakistan were identified, and selected research students and senior working professionals were added to broaden the range of professional experience being surveyed. Second, Pakistani faculty members working abroad and with extensive research experience were included. Third, some selected academics with

publishing experience from India, known to the author through international conferences, were included, as both countries share a lot of common culture. Furthermore, the well-known academics from Australia, New Zealand, the UK and the US were included. These academicians were editors of international journals, had close working alliances with their counterparts in the developing countries, and had either visited Pakistan or reviewed PhD-level research from Pakistan. It was assumed that, as editors of journals, they must have had extensive experience in reviewing the research papers submitted to those journals from the developing countries, including Pakistan. They were included to gain additional international perspectives on the issues (however, only three such respondents each from the US, the UK, and Singapore responded to the survey). Ninety selected respondents were emailed a brief introduction to the study and the Web address of the questionnaire. The fifty-one responses (a 57 per cent response rate) submitted by the closure of the survey formed the basis for the descriptive data analysis done using SPSS. A *t*-test was employed to find out the difference of opinion between the two types of respondents (i.e., practising professionals and faculty). The textual data obtained in response to the third part of the questionnaire regarding suggestions was content analysed.

DATA ANALYSIS

Demographics

The analysis of respondents' organizational affiliation, name, and their title or designation shows that professionals from various types of libraries and academic institutions contributed to the survey (Table 1). More than two-thirds of the responses were from Pakistan.

A majority of the respondents belonged to the first category—that is, LIS faculty from Pakistan and abroad—and most had PhD degrees.

Factors affecting the production of quality LIS research

The following section presents analysis of the quantitative data that illustrates the strengths of various identified factors hindering the quality and quantity of research produced in the country.

Comparison of the mean values in Table 2 shows that 'lack of critical thinking' (3.39), 'lack of research culture and encouragement' (3.39), and 'inadequate imparting of research skills in LIS education programs'

TABLE 1. Respondents' professional status and country ($N = 51$)

	Respondents	Percentage
Respondent status		
Faculty/teaching	19	37
Professional/librarian	26	51
Not indicated	6	12
Total	51	100
Respondent nationality		
Pakistan	32	–
India	4	–
Kuwait	4	–
Singapore	2	–
UK	2	–
US	2	–
Saudi Arabia	1	–
Not indicated	5	–

TABLE 2. Descriptive statistics of factors hindering the quality of research

Factors	*N*	Min.	Max.	Mean	Std. deviation
Lack of research culture and encouragement	51	2	4	3.39	.723
Lack of critical thinking	51	1	4	3.39	.802
Inadequate imparting of research skills in LIS education programs	51	1	4	3.33	.792
Lack of command over academic/research English reading, apprehension, and writing skills	51	2	4	3.16	.809
Lack of coordination between research communities	51	2	4	3.14	.775
Lack of skills of synthesizing and using the acquired knowledge	50	2	4	3.10	.789
Lack of peers'/seniors' guidance	50	1	4	3.08	.922
Lack of research-oriented academic programs (MPhil, PhD)	51	1	4	3.00	.894
Lack of access to relevant literature	51	1	4	2.49	.925
Lack of ICT competencies	50	1	4	2.46	.788

Note: 1 = not at all; 2 = to some extent; 3 = to moderate extent; 4 = to great extent

(3.33) were perceived to influence research quality more than other factors. 'Lack of command over academic/research English' (3.16) and 'lack of skills of synthesizing and using the acquired knowledge' (3.10) were perceived to be of moderate importance. 'Lack of ICT [information and communication technology] competencies' and 'lack of access to relevant literature' had mean scores of 2.46 and 2.49, respectively.

Figure 1 highlights the percentages of all identified hindering factors. It shows that 'lack of critical thinking' had the highest rating (57%) of being a barrier to the production of quality research 'to a great extent.' It was followed by 'lack of research culture and encouragement' (53%). 'Inadequate imparting of research skills in LIS education programs' (51%) also was strongly identified as a barrier. 'Lack of command over academic/research English reading, comprehension, and writing skills' (41%), and 'lack of peers'/seniors' guidance' (40%) were both considered noteworthy barriers to the production of quality research. 'Lack of ICT competencies' and 'lack of access to relevant literature' were identified as being barriers to the production of quality research 'to a great extent' by only 8% and 14% of respondents. These low ratings illustrate their nominal importance in the production of quality research. Alternatively, it may be that ICT competencies and availability of literature are in a better state in Pakistan.

Difference of opinion between the faculty and professionals

An independent-sample *t*-test was done to find out whether there is any significant difference of opinion between faculty and practising professionals (Table 3).

The analysis of variance reveals that no significant difference exists between the opinions of both groups except for the factor 'lack of ICT competencies' ($t = -2.160$, sig $= .37$). High mean scores of this factor by the professionals confirm that professional librarians consider it a more significant hindrance than faculty members do.

Twenty-four respondents replied to the open-ended option of 'other' to offer further suggestions. The thematic categories that emerged from analysis of the respondents' statements are presented in Table 4 along with the number of times each was mentioned.

Table 4 shows that ten out of twenty-four respondents regarded lack of adequate education and training in LIS as a barrier. The other categories that emerged through the analysis are 'lack of incentives/rewards'

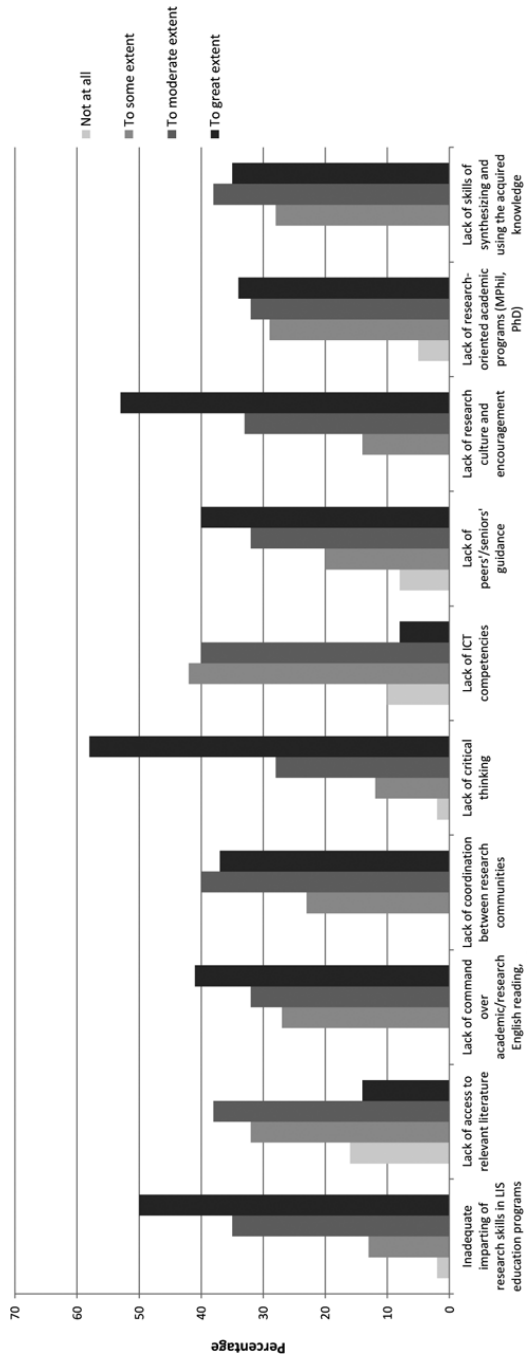

FIGURE 1. Factors hindering the production of LIS research

TABLE 3. *t*-test showing difference of opinion of the respondents on the basis of their status

Factors	Mean		*T*	Sig.
	Faculty/ teaching	Professional/ librarian		
Lack of ICT competencies	2.11	2.60	−2.160	.037*
Lack of research-oriented academic programs (MPhil, PhD)	2.68	3.19	−1.947	.058
Lack of critical thinking	3.11	3.50	−1.612	.114
Inadequate imparting of research skills in LIS education programs	3.53	3.23	1.275	.209
Lack of peers'/seniors' guidance	3.21	2.96	.864	.392
Lack of command over academic/research English reading, apprehension, and writing skills	3.26	3.08	.745	.461
Lack of coordination between research communities	3.00	3.15	−.639	.526
Lack of access to relevant literature	2.37	2.50	−.470	.640
Lack of skills of synthesising and using the acquired knowledge	3.00	3.08	−.308	.760
Lack of research culture and encouragement	3.32	3.35	−.135	.893

* The mean difference is significant at the .05 level

TABLE 4. 'Other' barriers mentioned by respondents ($n = 24$)

Barriers	Times mentioned
Lack of adequate research education and training programs	10
Lack of incentives/rewards	4
Lack of commitment, effort, interest, and hard work	4
Lack of quality publishing avenues at the national level	3
Lack of access to relevant literature	2
Lack of financial support	1
Undermining locally produced literature	1

TABLE 5. Suggestions for improving research quality

Specific suggestions	Time mentioned
1. Extensive research education and training programs should be initiated.	13
2. Better guidance by peers, seniors, and academics is needed.	6
3. Only people with aptitude and commitment to research should engage in research.	6
4. A research culture should be promoted.	5
5. Research collaboration is needed at national and regional levels.	4
6. Quality research should be rewarded.	4
7. Necessary funding, facilities, and infrastructure should be provided.	4
8. Taking up research merely for the sake of promotions and jobs should be discouraged.	3
9. There should be better access to local and international literature and the free flow of information.	3
10. Viability of topics: research focus should be not only on 'cutting-edge' technology issues but should include the cultural diversity in LIS, applied topics leading to solution of practical problems as well as more theoretical concerns.	3
11. Thesis writing should be compulsory at the master's level.	2
12. Critical thinking should be improved.	2
13. Writing skills should be improved.	1

and 'lack of commitment, efforts, interest, and hard work' on the LIS community's part. The respondents emphasized again in this section the importance of learning research skills through formal education and training. Haider and Mahmood also mentioned that the absence of proper guidance generally results in research writings of weak quality. [21]

Suggestions

Twenty-nine respondents furnished multiple suggestions in response to the open-ended question seeking their suggestions for improvement of research quality. These are identified in Table 5. Again, the most-mentioned suggestion is related to providing and receiving proper, formal research education and training.

The findings support O'Connor and Park's position, which emphasizes the need for better research education and practice at LIS schools,

and that this field needs to be honest about the ability to educate researchers who contribute to the relevant journals and other publications.[22] The responses in this section reveal the troubled state of LIS research education in Pakistan. A related prerequisite to the production of quality research is sound guidance by experienced researchers. Learning research methods and high-level writing skills is a lifelong pursuit. Guidance, both formal and informal, by seasoned scholars should help ease the burden of 'going it alone.' A Pakistani university librarian stated that there should be research forums in LIS schools to guide interested librarians in their research. Another very senior Pakistani university librarian, who has travelled to libraries outside of the country, had the following point of view: 'Research and publication for the sake of promotion is restricting quality research and genuine interest in research.'

The following comments on research quality from an Indian professor and head of an LIS department illustrate the barriers to producing quality research in India: 'It [conducting research] should be fulltime, on a live problem under able guidance of peers to those who have an aptitude for research, development and better understanding, and not a mechanism to simply have a short cut ... for degrees and promotions and later become a shame and a liability with a noble profession.' Another Indian LIS leader and professor stated, 'There should be rigorous rules and regulations to control the diluting quality in LIS research.' The comments show that the situation has been different in Pakistan compared to India. The number of PhDs is comparatively very high in India due to the loose system of quality assurance. Content analysis of the answers from Indian respondents revealed that nepotism and favoritism are seen as problems. However, India's University Grants Commission has started working on taking solid steps to ensuring the quality of the research it supports.

It was also suggested that research should focus more on the problem-solving approach instead of on pure research, and on the cultural aspects of the profession. A US-based African professor with a lot of experience visiting the developing world supplied the following suggestion: 'Lack of collaboration among researchers in the country and across the borders [is a barrier]. Most of the researchers are looking for collaboration with the developed world as role models and expertise.' Six suggestions were mentioned only one to three times.

DISCUSSION

This section aims to add a brief discussion on this topic. The public-sector education system in Pakistan is still, by and large, very traditional—that is, based on textbooks and classroom teaching instead of resource-based learning. It does not promote critical thinking among students at any level of education.

Regarding the command over English language and the synthesizing skills, the author has found in her nineteen years of experience as a teacher, including seven years as a research supervisor at the country's oldest LIS school and four years as an editor of the only refereed LIS research organ published from Pakistan (*Pakistan Journal of Library and Information Science*), that these are serious barriers in Pakistan. The pedagogy of teaching English as a second language in public schools and colleges is mostly very poor. Students learn hardly any creative writing skills, fundamental grammar rules, and composition styles. So, while the LIS schools impart research skills, they need to provide instruction on writing skills too.

Regarding the lack of research culture, it is interesting to note that there are only a few senior researchers and PhD faculty members available throughout the country. Furthermore, those with PhDs didn't bother to create a research culture and encourage junior colleagues. Nevertheless, this situation has started to improve since the dawn of the twenty-first century.

Findings show a relatively better state of affairs in terms of ICT competencies and access to literature. In fact, the establishment of the HEC National Digital Library in 2004 has provided access to thousands of scholarly journals and books in all fields in Pakistan. Previously, full-text access to global literature was very difficult and minimal. Yet it can be still stated that the ever-increasing dissemination of scholarly information in digital form makes the lack of ICT competencies a barrier to some extent.

As far as the 'lack of quality publishing avenues at the national level' is concerned, there is only one double-blind, peer-reviewed research organ, *Pakistan Journal of Library and Information Science* (*PJLIS*), which is published on an annual basis. The other side to this problem, according to the author's four-year experience as editor of this journal, is getting quality research papers for the journal, which has been a very hard task. The HEC gives a higher importance to papers published in

the foreign journals, and this has driven Pakistani authors to explore the foreign journals first for publishing opportunities. Even a very low-quality US-based open-access journal is preferred to *PJLIS* because it is considered a foreign publication.

The author has found through seven years of theses-supervision experience that lack of critical and logical thinking, lack of research knowledge and its application, and weak writing skills are serious barriers to the production of high-quality research. The students who get good grades in the research course work—as its assessment is generally based on reading and memorizing texts and then reproducing them—do not always have good problem-solving skills and find it hard to develop viable research proposals.

CONCLUSION

The data analysis demonstrates that the following problems might be addressed to help overcome the principal barriers to the production of quality research. The academic and training programs at LIS schools should be redesigned so that they provide better education in research and hands-on experience in the field. Extensive training in critical thinking is a must for the young researchers; however, under the present education system, it seems a very hard task. The HEC should devise more focused and clearer procedures for evaluating the research submitted for higher degrees, publications, promotions, and monetary rewards. Undermining local journals and local experts has also had negative effects on the quality of local journals. Senior academics can play a role in the growth of the maturing researchers by helping them produce good-quality research. Nepotism is also an important barrier, and plays a role in the assessment of research output.

The study, based on a literature review and analysis of survey data, establishes that producing quality research is challenging in Pakistan, particularly because of the type and strength of barriers that have been identified. Overcoming these barriers requires commitment, passion, and everlasting lust for learning, along with the aptitude for research. It would be interesting to extend this study to other developing countries in other regions of the world to determine whether there are common barriers to the production of quality research in Africa, Latin America, and other parts of Asia. Some barriers reported by Muhammad, such as inadequate funding and ineptitude for research, are also reported by this study.[23]

KANWAL AMEEN (PhD) is chair of the Department of Library and Information Science at the University of the Punjab (PU) in Lahore. She has been awarded a number of international and national scholarships, including the Fulbright Visiting Scholar grant (2009–2010) and the Fulbright Foreign Student grant (2000–2001). Professor Ameen has produced more than seventy publications that have appeared as international refereed journal articles, conference proceedings, and book chapters. She was the chief editor of *Pakistan Journal of Library and Information Science* from 2005 to 2009.

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