Assessment of ICT Skills of LIS Graduates and Market Demand: A Case of Punjab, Pakistan

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This article aims to explore information and communication technology (ICT) skills of Library and Information Science (LIS) graduates in the Punjab, Pakistan. It also identifies the ICT skills needed by information market for absorption of LIS graduates. A mixed methods research design was employed to collect data from LIS graduates and heads of leading libraries in the Punjab through the questionnaire and semi-structured interviews respectively. The findings suggest that LIS graduates possess theoretical knowledge and basic skills of ICT. The majority of graduating students have an intermediate level of ICT skills. Their current ICT skills are not adequate to meet the job market needs. A number of ICT skills that LIS graduates need to possess for employability have been identified. Deficiencies in LIS curricula, the lack of practical training, the paucity of faculty teaching ICT courses and meager ICT facilities are the major factors that hinder the development of students' ICT skills. The outcomes of the present research will help LIS schools in the Punjab to redesign their curricula by incorporating necessary contents in ICT courses and equip students with ICT skills in accordance with needs of the job market.

Keywords: ICT skills, LIS graduates, LIS market needs, LIS schools, Punjab, Pakistan

INTRODUCTION

Information and communication technology (ICT) has become popular in the modern world, especially in the industrial societies. The introduction of ICT has brought a rapid change in all spheres of life ranging from social and political aspects of a region to the world economy (Rekabdarkolaei and Amuei, 2008). Since ICT has potential benefits to bring about changes in the existing structural, social, political, and economic inequities, the access to ICT can enhance individual and collective

capabilities of people to better achieve the lifestyle aspired of. Thus, ICT can play a vital role as a means to an end, rather than an end itself (Casal, 2007).

Over the past three decades, ICT has changed the very nature of library and its services. The library once considered to be a repository of books has now transformed to an information center providing multifarious services to users. All types of libraries are expected to embrace this technology for performing various library operations more efficiently, and for providing different library services more quickly. It has changed the way the information is created, stored, retrieved and disseminated. In order to create an informed society, libraries should be in a position to enable the user community to access their services and resources through the use of ICT (Nyamboga, 2004).

Library and Information Science (LIS) professionals face various challenges posed by new developments in ICT. The tools that LIS professionals used in their daily work have changed in the twenty-first century. LIS professionals' role has become more dynamic in the modern information environment. Today, LIS professionals are known as researchers, information managers, facilitators, multimedia librarians and end-user trainers. ICT has produced new approaches to work. It has changed the working style and job expectation (Salisu, 2002). In the current digital environment, LIS professionals are expected to possess necessary ICT skills as services of most of the libraries are now revolving around ICT (Fatima, Shafique and Firdous, 2012).

The job market appears to have a great demand for LIS professionals equipped with ICT competencies. The importance of the role of ICT components in LIS education cannot be ignored (Francisca, Reuben & Emeka, 2017; Tyagi & Yanthan, 2017). LIS students are required to be equipped with the latest ICT skills in order to meet the needs of the twenty-first century information market. LIS schools need to develop students' ICT competencies required by the job market in order to enhance their employability (Pradhan, 2015). Keeping in view the importance of ICT in libraries, LIS schools across the globe have redesigned their curricula by incorporating ICT courses in the curricula (Jain & Jorosi, 2017). There is a need for collaboration between the academics and LIS practitioners in order to address the challenge of equipping LIS students with ICT skills in accordance with the job market needs. The LIS schools need to be aware of the employability status of their graduates in the job market, and accordingly develop new competencies including ICT skills to enhance their employability. They are required to review employability

needs of LIS professionals on a regular basis and make corresponding changes in the curriculum (Pradhan, 2015).

LITERATURE REVIEW

Impact of ICT on Libraries

The flood of information, expansion of knowledge and research, changing concepts regarding information resources and library services have obliged all types of libraries to use ICT. The introduction of the Internet and its associated Web technologies have changed both the way libraries provide information services to their users and the way the users prefer to access information (Chowdhury & Margariti, 2004). Libraries are challenged to provide greatest information access and improved levels of service by keeping pace with technological innovations. ICT has enabled libraries to create, preserve, process, manage and disseminate information effectively. Libraries can perform various tasks, such as cataloguing, classification, acquisition, circulation, and provide various services, such as interlibrary loan, selective dissemination of information, reference services, and online information retrieval effectively and efficiently (Goswami, 2009; Muhammad and Almu, 2013). The main purpose of the application of ICT in libraries is to ensure the accessibility of right information for the right user at the right time for pacifying his thirst for information. ICT has brought vital changes in the traditional librarianship, and outdated ways of library profession and practices (Qutab, Bhatti, and Ullah, 2014).

ICT Skills for LIS Professionals

The introduction of ICT in libraries has necessitated LIS professionals to equip themselves with the latest ICT skills to perform various library tasks and services effectively, and maintain and promote their status in the modern information society. It is the only way to save them from future challenges (Kattimani and Naik, 2013). ICT has enabled them to enhance their professional competence (Kirkup and Kirkwood, 2005). It has opened new horizons for them and has changed their traditional method of working (Ogunsola, 2005). It has enabled them to bring about vital changes in libraries. In view of the importance of ICT in libraries, LIS schools are required to train students in the latest ICT skills so that they can meet the needs of the emerging information market. ICT skills have become a central point of the twenty-first century LIS education (Buarki, Hepworth and Murray, 2011; Hanson-Baldauf and Hughes-Hassell, 2009; Kavulya, 2007).

Integration of ICT into LIS Programmes

With the advent of ICT in libraries, library schools all over the world started to integrate ICT into LIS education in order to equip students with necessary ICT skills. Beheshti (1999) found that the advances in ICT had a great impact on LIS education in the USA and Canada as LIS programmes had undergone major curriculum changes in response to technological developments. In the USA, He (1999) noted that more than one third of the courses included in the curricula of four LIS schools were ICT-oriented. These courses included information storage and retrieval, information systems, library automation, multimedia and system analysis, database systems, online library systems and database management. Whereas, Xu (2003) observed that more than twenty percent of the courses included in forty-two LIS programmes were ICT-oriented, which included ICT in general, information storage and retrieval, database design and applications, Web technologies, operating systems, programming-based systems, e-commerce technologies, electronic publishing, system design, introduction to computer networking. It implies that the schools determined to develop students' ICT skills in order to respond to the technological developments taking place in libraries. However, Fortney (2009), in a study conducted to analyze LIS education by comparing it to library market needs for ICT skills, found that several LIS programmes required little technological skills. He recommended that LIS programmes should have an ICT literacy component as part of their requirements and integrate ICT into their curricula. LIS associations, schools and researchers should provide robust curricula to meet the requirements.

Hallam (2006) reviewed the current trends in LIS education in Australia including student numbers, teaching staff and curriculum issues. He observed that the nature of LIS curriculum, being multidisciplinary, required knowledge and skills that combine aspects of information technology, management, psychology and education. He recommended that the contents of LIS courses should be regularly evaluated, revised and updated in order to respond to the quickly changing information market needs.

In Africa, Aina and Moahi (1999) found that more contents, such as ICT hardware and software, database, information systems and systems development were required to be incorporated in ICT courses offered by the LIS School at the University of Botswana. Ocholla (2001), in a study conducted to find out whether the knowledge and skills of LIS graduates of University of Zululand meet the market requirements, also observed that the students were required to have a sound

education in management, information analysis and synthesis, information and communication technologies, searching and retrieval, and the ability to perform practical work. However, Ocholla and Bothma (2007) noted that ICT was included into all LIS programmes and sometimes offered as a specialization. Similarly, Minishi-Majanja (2007) found that curriculum developments showed considerable strides in infusing ICT competencies in LIS schools in Sub-Sahran African countries, but teaching appeared to remain theoretical as schools lacked adequate resources for extending practical training. The study reported a great diversity in countries in terms of coverage and treatment corresponding to the availability of relevant facilities in respective countries. ICT modules generally covered different application software, intranet, and the Internet, but the coverage was not uniform across countries and schools. Shongwe (2015) noted that since LIS job market in South Africa required LIS professionals equipped with advanced ICT skills, LIS schools should introduce advanced ICT courses to their curricula in order to meet employers' expectations. Francisca, Reuben and Emeka (2017) examined ICT courses offered by LIS schools in Nigeria and found that LIS educators did not apply the ICT infrastructure in their teaching due to large class size, erratic power supply, inadequate ICT infrastructure, which prevented LIS students from developing necessary ICT skills.

In Kuwait, Rehman and Mohammed (2002) noted that as new ICT applications emerged, LIS curricula needed to be revised keeping in view the market needs, otherwise LIS schools would fail to provide students with the appropriate skills. There was a need to include new ICT courses in curricula, which deliver the required ICT skills in order to survive in the constantly changing information world. Rehman (2008) indicated that employers were dissatisfied with LIS graduates of Kuwait University for their employability due to their inadequate ICT skills. He stressed that LIS curriculum should be redesigned in relation to the emerging market needs. Buarki et al. (2009), in a study carried out to explore ICT skills of LIS students at Kuwait University, also found that the students lacked many of ICT skills required by the job market. They further found that the curriculum was outdated and teaching methods used were traditional. They recommended that ICT courses be improved by collaborating with prospective employers to identify what types of skills are actually needed. Al-Daihani (2011) analysed ICT education in LIS programmes offered by two LIS school in Kuwait and noted that LIS curricula needed to be revised by incorporating more focused ICT courses that meet the needs of ever-changing job market requirements.

Al-Shwabkah et al. (2016), in a study carried out to explore students' perceptions about the integration of ICT courses in LIS progrmmes at four major LIS departments in Jordanian universities, found that students stressed the need for incorporating ICT courses comprising various topics in LIS progrmmes. The students suggested that LIS departments should revise ICT courses on a regular basis in order to keep up with job market needs.

Blankson-Hemans and Hibberd (2004), in a study conducted to explore skills requirements for LIS graduates in the commercial sector around the world, observed that the graduating students were required to improve their skills in various areas (time management, marketing, communication, interpersonal and research skills, public relations, information technology) as changes made in LIS curricula to meet these needs had not fully served the purpose of preparing them for immediate absorption into the workforce.

In Malaysia, Rehman, Abu Bakar and Majid (1998) found major discrepancies in the demands and preparedness of entry-level LIS professionals in various areas including information technology. They stressed the need for developing students' knowledge and skills in ICT through formal LIS education. Ebrahimi (2009) noted that there was a need to incorporate more ICT modules in LIS curriculum in Iran and enhance the instructional methods in order to equip students with necessary ICT skills. He proposed that a continuous review of curriculum for integrating ICT into LIS education should be conducted. Horvat (2003) pointed out that LIS education at the LIS School in Croatia had changed, as the school had incorporated new ICT courses in the curriculum.

Kamila (2008) explored the integration of ICT into LIS curricula in India. He noted that major ICT contents integrated into the curricula included telecommunication, networking, library automation, and internet applications. Inadequate technological infrastructure was considered a major constraint to support the integration of ICT courses in the curricula. He also found a gap between job market needs and LIS curricula, and a lack of ICT skills among instructors and support staff. Bilawar and Jadhav (2015) conducted a study to explore attitudes and perceptions of LIS students towards library profession and education in ICT environment at the LIS school in Shivaji University, Kolhapur, Maharashtra, India. They noted that the students stressed the need for revising LIS syllabus by incorporating more ICT components such as, digital libraries, website development, e-resources and web-based services, library automation and networking, Web 2.0/3.0, ICT basics, mobile technology in the syllabus. Tyagi and Yanthan (2017)

analysed contents of ICT courses included in LIS curricula of postgraduate degree programmes offered by thirty-seven LIS departments in India. They observed that contents of ICT courses incorporated in LIS curricula were not standardized. The schools needed to design the curriculum that should be vibrant enough to concentrate on new technologies and advancements in the field of LIS. They suggested that other topics such as, cloud computing and security, wireless sensor networks, web entrepreneurship, Cyber-Physical systems (CPS), content delivery technologies for creative social media and convergence, should be included in the LIS curriculum.

In Bangladesh, Hossain and Sormunen (2019) discovered that although LIS schools at two universities had incorporated ICT courses in their curricula, they only helped the students to develop their skills in general computer and internet skills but failed to improve the students' skills in advanced ICT-related tasks and in evaluating internet resources.

Integration of ICT into LIS programmes in Pakistan

In Pakistan, ICT courses have been included in curricula of various LIS programs. These courses include major contents, such as computer basics, application software, operating systems, telecommunication and networking, databases. They aim to enhance students' ICT skills in order to enable them to cope up with new challenges in the field of librarianship (Mahmood, 1996). The LIS curriculum for the master's programme offered by library schools in the Punjab contains four ICT related courses. The contents included in these courses are: application software, telecommunication and networks, operating systems, databases, library automation (OPAC services, MARC, E-DDC, Web designing, etc.), library management software (KOHA, LIMS), indexing and abstracting services, online information retrieval, vocabulary control, etc. (Fatima, Shafique and Firdous, 2012). However, there is a gap between the library practice and contents of the curriculum. LIS graduates are deficient in a number of skills including ICT skills required by the library job market. More contents, such as new library management software packages, e-subscription and licensing issues, digitization, database management, digital archiving, digital librarianship are required to be incorporated in ICT courses (Mahmood, 2012). Wairrach and Ameen (2011), in a study carried out to explore employability skills of LIS graduates of the University of the Punjab, Pakistan, have also observed that although the curriculum for the master's programme offered by the LIS School has been designed well, but it has not fully

met the market needs. They have recommended that ICT courses should include more contents in the following areas: Web searching, database design, use of online resources and specialized access through free and low paid subscriptions, digitization and indexing digitized material. Whereas, Fatima, Shafique and Firdous (2012) have noted that owing to meager ICT facilities, the lack of ICT skills among faculty and the lack of practical training, LIS students in two library schools in the Punjab are not well equipped with modern ICT skills. Ansari (2013), in a study conducted to investigate ICT proficiency of LIS professionals working in university libraries in Karachi, found that LIS professionals who graduated from library schools during the last five years had better ICT skills as compared to those who were graduated earlier. Ahmed and Rehman (2016) conducted a study to explore perceptions and the level of ICT competencies of LIS professionals working in public sector university libraries in Khyber Pakhtunkhwa. They discovered that LIS schools in Khyber Pakhtunkhwa needed to revise their LIS curricula by incorporating ICT courses in accordance with current job market needs. Moreover, the schools should emphasize practical training in order to develop the required ICT competencies in LIS students and extend the duration of internship program, so that the students can obtain practical training in ICT skills. Iqbal and Khan (2017), in a study carried out to explore ICT skills of librarians working at the University of Punjab, found that they lacked advanced ICT skills. The researchers stressed the need for revising LIS curriculum by incorporating advanced ICT skills in ICT courses in order to meet ever-changing requirement of modern libraries.

Research Objectives

The objectives of the research study are:

- To investigate the current level of LIS graduates' ICT skills in the Punjab.
- To explore the effectiveness of ICT skills training provided by LIS schools in the Punjab in developing students' ICT skills.
- To identify the factors hindering development of students' ICT skills.
- To identify LIS job market needs for ICT skills in the Punjab.
- To compare LIS graduates' ICT skills with the job market needs in the Punjab.

METHODOLOGY

A mixed methods research design combining both quantitative and qualitative research methods was employed to achieve objectives of the study. The quantitative research method was used to assess ICT graduates' ICT skills, while the qualitative research method aimed to explore the demand of the job market. In the first phase, the quantitative data were collected through the questionnaire survey. On the basis of the literature review, a questionnaire was developed to collect the quantitative data. The questionnaire aimed to explore the level of LIS graduates' ICT skills, the effectiveness of ICT skills training provided by the schools and difficulties faced by the students in developing ICT skills. The questionnaire was sent to library professionals working in different libraries and faculty members at LIS schools in the Punjab to seek their comments. Keeping in view their comments, some necessary modifications were made in the questionnaire. Cronbach's Alpha was used to assess the reliability of the questionnaire. Cronbach's alpha score was 0.898, which showed that the questionnaire was reliable.

The targeted population for the quantitative study was graduating students of the master's programme at LIS schools providing on-campus education in public sector universities in the Punjab, i.e. the Islamia University of Bahawalpur, University of the Punjab, Lahore, Bahauddin Zakariya University, Multan and University of Sargodha. There was a total of 119 graduating students of the master's programme in all the four schools. To collect the data, no sample was drawn. Instead, census method was used which involves gathering data from every member of the population. The questionnaire was distributed to all students. Out of 119 students, 109 students completed and returned the questionnaire, with the response rate of 91.5%. The quantitative data collected through the questionnaire survey were analysed using IBM SPSS, Statistics, V21. Descriptive statistics (i.e. frequency, percentages, mean and standard deviation) were used to analyse the quantitative data. In the second phase, the qualitative data were collected through semi-structured interviews with employers. Keeping in research objectives, an interview schedule was developed. It aimed to explore the job market needs for ICT skills.

The interviews were conducted with heads of six leading academic libraries (three each in public and private sector) in the Punjab. Heads of academic libraries were selected employing a purposive sampling technique and they included: (i) Dr. Nadeem Saddique, University of Management Sciences Library, Lahore; (ii) Rafique Awan, University of Management and Technology Library, Lahore; (iii) Dr. Ijaz

Miraaj, University of Engineering and Technology Library, Lahore; (iv) Bushara Almas, Forman Christian College University Library, Lahore; (v) Muhammad Naeem, Government College University Library, Lahore; (vi) Haseeb Ahmad Piracha, University of the Punjab Library, Lahore. The selected libraries are the largest employer organizations for LIS professionals. The qualitative data gathered through interviews were analysed thematically, and major qualitative findings are presented and discussed with main quantitative results in the discussion section.

FINDINGS

In order to achieve objectives of the study, descriptive statistics (i.e. frequency, percentages, mean and standard deviation) have been used to analyse the quantitative data collected through the questionnaire. The data are analyzed and presented in the following sections.

Respondents' Demographic Data

The data were collected from graduates of four LIS schools offering on-campus LIS education in public sector universities in the Punjab. Out of a total of 109 respondents, the majority of the respondents (41, 37.6%) belonged to the University of the Punjab, Lahore, whilst the least number of respondents (17, 15.6%) came from Bahauddin Zakariya University, Multan (Table 1). Amongst the respondents, most of the respondents (77, 70.6%) were female, while 32 (29.4%) were male (Table 2). The majority of the respondents (95, 87.2 %) were between 18-25 years of age, followed by 10 (9.2%) between26-30 years of age, 4 (3.7%) between 31-35 years of age (Table 3).

Table 1

Frequency distribution of respondents by institute (N=109)

Institute	Frequency	Percent
University of the Punjab, Lahore	41	37.6
The Islamia University of Bahawalpur	32	29.4
University of Sargodha	19	17.4
Bahauddin Zakariya University, Multan	17	15.6
Total	109	100.0

Table 2

Frequency distribution of respondents by gender (N=109)

Gender	Frequency	Percent
Female	77	70.6
Male	32	29.4
Total	109	100.0

Table 3

Frequency distribution of respondents by age group (N=109)

Age	Frequency	Percent
18-25 years	95	87.2
26-30 years	10	9.2
31-35 Years	4	3.7
Other	0	0
Total	109	100.0

Purpose of Using ICT

The majority of the respondents (76, 69.7%) used ICT for Internet searching, followed by 51(46.8%) for database searching, 43 (39.4%) for emailing, 39(35.8%) for library catalogue searching, 22(20.2 %) for office applications. While, only 12 (11.0%) respondents used ICT for designing and developing web pages (Table 4).

Table 4

*Purpose of using ICT (N=109) **

Purpose	Responses		
	Frequency	Percent	Percent of cases
Internet searching	76	31.3	69.7
Databases searching	51	20.9	46.8
Emailing	43	17.7	39.4
Library catalogue searching	39	16.0	35.8
Office applications	22	9.0	20.2
Web page design and construction	12	4.9	11.0
Other	0	0	0
Total	*243	100.0	229.9

*N=109, multiple responses.

Level of Students' ICT Skills

The students were asked to rate the level of their ICT skills by using a five-point Likert scale (1=Excellent, 2=Very Good, 3=Good, 4=Intermediate, 5=Poor). The mean scores were calculated for students' each ICT skill in order to determine its rank. Among different ICT skills possessed by the students, use of Microsoft office applications (mean= 3.94) was ranked as the first, while operating Graphics software, coral draw adopt Photoshop was ranked as the twenty fourth (mean=2.56) by the students. The students' ICT skills as rated by them are presented in Table 5.

Table 5

Level of students' ICT skills (N=109)

ICT skill	N	Mean	Std. Deviation	Rank
Use of Microsoft office applications	109	3.94	1.096	1
Operating email systems	109	3.82	1.124	2
Developing and managing video conferences	109	3.80	1.078	3
Searching and retrieving information from the Internet	109	3.80	1.185	3
Online blogging	109	3.61	1.194	4
Data compression (WinZip)	109	3.54	1.183	5
Referencing software (End note, ProCite, etc.)	109	3.43	1.212	6
Barcode technology, RFID	109	3.43	1.125	6
Data conversion utilities and copy cataloging	109	3.39	1.037	7
Developing and managing online library services	109	3.39	1.106	7
Developing and managing a digital library	109	3.35	1.250	8
Electronic indexing and abstracting services	109	3.31	1.230	9
Operating systems: windows; XP; LINUX.	109	3.30	1.159	10
Digitization (Scanner, Software, OCR)	109	3.23	1.274	11

ICT skill	N	Mean	Std. Deviation	Rank
Networking (LAN/WAN, etc.)	109	3.20	1.223	12
Data analysis (research) software (SPSS)	109	3.18	1.148	13
Library electronic tools: e-DDC, e-LCSH.	109	3.17	1.239	14
Online resource sharing	109	3.14	1.084	15
Bibliographic formats (MARC, Z39.50, Metadata)	109	3.14	1.126	15
File formats	109	3.12	1.176	16
Maintenance of in-house databases	109	3.11	1.165	17
Use of library automation/ management systems (e.g. KOHA, LIMS, LAMP etc.)	109	3.06	1.290	18
Searching and retrieving information from the database	109	2.98	1.186	19
Using Web 2.0/3.0 for designing and managing library services	109	2.97	1.166	20
Hardware troubleshooting	109	2.82	1.124	21
Knowledge of CMS (word press, joomla, etc.)	109	2.76	1.162	22
Designing and developing Web pages	109	2.67	1.028	23
Graphics software, coral draw, adobe Photoshop	109	2.56	.957	24

Scale: 1 = Excellent; 2 = Very Good; 3 = Good; 4 = Intermediate; 5 = Poor

Overall Level of Students' ICT Skills

The majority of the respondents (83, 76.1%) rated the overall level of their ICT skills as intermediate, followed by 19 (17.4%) as beginner, 7(6.4%) as proficient (Table 6).

Table 6

Overall level of students' ICT skills (N=109)

ICT skills level	Frequency	Percent
Intermediate	83	76.1
Beginner	19	17.4

Proficient	7	6.4
Other	0	0
Total	109	100.0

ICT Skills Training

The participants were asked to give their opinions about various aspects of ICT skills training provided by LIS schools by using a five-points Likert scale (1= strongly disagree, 2= disagree, 3= no opinion, 4= agree, 5= strongly agree). The majority of the respondents agreed that they learnt useful ICT skills (mean = 3.84), they were motivated to develop ICT skills (mean =3.74), they were confident in their ICT skills learnt to use different ICT applications (mean = 3.58). Whereas, most of the respondents gave no opinion about the adequacy of ICT skills practical training (mean = 3.45) and ICT theoretical teaching (mean = 3.45) provided by the LIS schools (Table 7).

Table 7

Effectiveness of ICT skills training (N=109)

Statement	N	Mean	Std. Deviation
I learn useful ICT skills through the MLISc programme	109	3.84	.915
I am motivated to develop my ICT skills through the MLISc programme.	109	3.74	1.134
I am confident in my ICT skills learnt through the MLISc programme to use different ICT applications effectively.	109	3.58	1.141
The degree of ICT skills practical training (hands-on), provided through ICT courses, is sufficient to perform different activities and assignments required by the MLISc programme.	109	3.45	1.014
The degree of ICT theoretical teaching, provided through ICT courses, is sufficient to perform different activities and assignment required by the MLISc programme.	109	3.45	1.014

Scale: 1 = Strongly Disagree; 2 = Disagree; 3 = No opinion; 4 = Agree; 5 = Strongly Agree

Mode of ICT Skills Training

The majority of the respondents (76, 69.7%) preferred group training, followed by 24
(22.0. %) one-to-one training, 9 (8.3%) self-study to develop ICT skills (Table 8).

Table 8
Preferred mode of ICT skills training (N=109)

Mode of training	Frequency	Percent
Group training	76	69.7
One-to –one	24	22.0
Self-study	9	8.3
Other	0	0
Total	109	100.0

Additional ICT Skills Training

In addition to ICT training obtained from LIS schools, the majority of respondents (36, 33.0 %) received the training from ICT experts, followed by 27 (24.8%) through online courses, 24 (22.0 %) through private institutions, 22(20.1%) through friends and family to develop ICT skills. Whereas, 28(25.7 %) students did not get any additional ICT training (Table 9).

Table 9
*Additional ICT skills training received (N=109) **

Sources	Responses		
	Frequency	Percent	Percent of Cases
ICT expert	36	26.3	33.0
Not taken	28	20.4	25.7
Online courses	27	19.7	24.8
Private institution	24	17.5	22.0
Friends and family	22	16.0	20.1
Other	0	0	0
Total	*137	100.0	125.6

*N = 109, multiple response.

Difficulties in Developing ICT Skills

The majority of the respondents (42, 38.5%) viewed the lack of ICT courses offered by LIS schools as a difficulty in developing ICT skills, while the lack of software was perceived by the least number of students (18,16.5%) as a hindrance to learning ICT skills (Table 10).

Table 10

*Difficulties in developing ICT skills (N=109) **

Barriers	Responses		
	Frequency	Percent	Percent of Cases
Lack of ICT course offered	42	19.2	38.5
Lack of practical training	41	18.7	37.6
Lack of staff teaching ICT courses	28	12.8	25.7
Low maintenance of ICT infrastructure	27	12.3	24.8
Low Internet speed connection	23	10.5	21.1
Lack of hardware	21	9.6	19.3
Lack of ICT skills among teaching staff	19	8.7	17.4
Lack of software	18	8.2	16.5
Other	0	0	0
Total	*219	100.0	200.9

*N = 109, multiple response.

DISCUSSION

Students' ICT Skills Level

The quantitative results indicate that students ranked the use of Microsoft office applications, operating email systems, managing video conferences, searching and retrieving information from the Internet, online blogging and data compression as the top five ICT skills which they possessed. These skills are considered to be the basic skills in the current digital era. Whereas, library-specific ICT skills such as, the use of library electronic tools (e-DDC, e-LCSH), online resource sharing, maintenance of in-house databases, managing library automation systems (e.g. KOHA, LIMS, LAMP etc.), searching and retrieving information from databases, using Web 2.0/3.0 tools, Web designing were ranked among the last eleven out of

twenty four skills by the students. It implies that the students were not well equipped with ICT skills required for performing various library tasks and services.

Moreover, the majority of students (76.1%) rated the overall level of their ICT skills as intermediate, 17.4% as beginner, and 6.4% as proficient. The percentage of students having a proficient ICT skills level was not encouraging as ICT skills are considered to be essential for information professionals in the present digital era. It is surprising to note that seventeen percent of the students were beginners at this stage (after graduating from LIS schools), whereas the use of ICT has become common in day-to-day activities in general and LIS education in particular. It shows that they did not receive enough ICT training through either their previous education or LIS education.

The majority of students had an intermediate ICT skills level, though they were expected to have a proficient skills level after graduating from LIS schools. It is supported by qualitative results as employers were of the view that LIS graduates possess very basic skills and theoretical knowledge of ICT when they are inducted in their organizations. One of the interviewees commented: "*They have basic knowledge of ICT skills. They have no idea of digitization, KOHA, Virtua, RFID technology, institutional repository, and subject guides related software skills."* Mahmood (2012) has also observed that various professional positions in libraries in Pakistan remain vacant due to the lack of LIS graduates possessing required competencies including ICT skills. A similar finding was reached by Buarki et al. (2010), who found that LIS students in Kuwait had basic knowledge of ICT skills but they lacked practical skills.

ICT Skills Training

The quantitative results show that students were satisfied with the usefulness of ICT skills learnt from LIS education, the motivation for developing ICT skills and the confidence they gained to use ICT skills. However, they did not seem satisfied with the adequacy of ICT theoretical teaching and practical training provided by LIS schools as most of them did not give their opinions about it. The quantitative findings also reveal that apart from the training received from LIS schools, the students got training from some other sources, such as ICT experts, online courses, private institutions, friends and family to develop ICT skills. It shows that both theoretical teaching and practical training provided by the schools were not adequate to develop students' ICT skills. It is supported by qualitative results as the interview participants were of the opinion that ICT courses and practical

training offered by the schools were not sufficient to equip LIS graduates with ICT skills required by the job market. The students lacked some of the latest ICT skills, such as skills required for operating Web 3.0 tools, e-cataloging and e-classification systems, digitizing the material, managing the digital library and library software (i.e. Dspace, KOHA, Virtua).

A similar finding has been reached by Warraich and Ameen (2011) and Mahmood (2012), who have noted that in addition to some other necessary competencies, LIS graduates in Pakistan lack the latest ICT skills required by the information market. LIS schools have not adopted the latest developments in ICT in education. The qualitative findings of the present study suggest that LIS schools need to provide practical training instead of merely theoretical teaching to develop students' ICT skills effectively, as one of the library heads remarked, *"Library and information science schools should design ICT courses with a good balance of theory and practice."* This finding concurs with the finding of Minishi-Majanja (2007) who found that LIS schools in sub-Saharan African countries were required to enhance practical training in ICT in order to improve students' ICT competencies.

Different modes of training can be offered to students to train them in ICT. The quantitative results indicate that the majority of students preferred group training and one-to-one training methods for learning ICT skills. A similar finding was reached by Luan, Abu Bakar, and Hong (2006), who found that students in an ICT course working in groups in Malaysia felt at ease and got support from their peers, while Hanson-Baldauf and Hassell (2009) discovered that students in public schools in the USA opted for one-to-one method to learn ICT skills. Library schools included in the present study need to keep in view the students' preferred mode while providing them training in ICT.

Barriers to ICT Skills Development

The quantitative results indicate that the lack of ICT courses and the lack of practical training provided by LIS schools were the major factors which hindered the development of students' ICT skills. It is supported by qualitative results as all library heads were of the view that LIS graduates are not trained well. They are taught only theoretical aspects of ICT but are not trained practically. Fatima, Shafique and Firdous (2012) have also noted that owing to the lack of practical training, LIS students in two library schools in the Punjab, Pakistan are not well equipped with modern ICT skills. Whereas, Mahmood (2012) has stressed the need for having a balance between the theoretical teaching and practical

training in various courses including ICT courses offered by LIS schools in Pakistan for developing employability skills among students effectively. The qualitative findings of the present study reveal that LIS curricula need to be redesigned by incorporating the latest contents in ICT courses. It concurs with the finding of Mahmood (2012), who has indicated a gap between the library practice and the contents of LIS curricula in the country. He has suggested that more useful contents should be incorporated in different courses including ICT courses.

Both the quantitative and qualitative results indicate that the lack of faculty members teaching ICT courses was also a factor which prevented students from developing ICT skills. A similar finding was reached by Warraich and Ameen (2011), who discovered that the shortage of faculty in the LIS school at the University of Punjab hindered the development of various employability skills including ICT skills among students. Both the quantitative and qualitative findings of the present study reveal that meagre ICT facilities available in LIS schools were another factor that hindered the development of ICT competencies among students. It concurs with the findings of Mahmood (2012) and Fatima, Shafique and Firdous (2012), who found that ICT facilities in LIS schools in the country were not adequate to train students in ICT skills. They emphasized the need for improving and upgrading them.

ICT Skills Needed by the Job Market

In order to enable LIS graduates to be absorbed into the workforce, it is necessary to develop skills among them in accordance with the job market needs. The qualitative results indicate that LIS graduates' current ICT skills were not adequate to meet the needs of the information market. The employers identified several ICT skills that LIS graduates lacked. They include skills for converting data from different types of cataloging formats to MARC format and Dublin Core Metadata format, handling library management software (e.g. Koha, Virtua, LIMS), open source repository software Dspace, subject guides software, RFID technology, institutional repository, online services, social networking sites, and Web 2.0/ Web 3.0 tools, online searching, data conversion, digitization, Web designing, graphic designing. Fatima, Shafique and Firdous (2012) also noted that students in two LIS schools in the Punjab, Pakistan needed to be equipped with various ICT skills required by the job market such as, handling different library software packages and social networking tools, using electronic resources, Web designing, database management, online searching. In Kuwait, a similar finding was reached by Marouf and Rehman (2007), who found that LIS employers required LIS graduates to

possess various advanced ICT skills. Whereas, in Kenya, Kavulya (2007) discovered that LIS students were required to be trained in some necessary ICT skills needed by the information market, such as skills required for database construction and its maintenance, digitization, information storage and retrieval, handling Web 3.0 and using the Internet. LIS schools included in the present study need to develop ICT skills among students in accordance with LIS market needs in order to enable them to gain employment and perform different library tasks effectively.

CONCLUSION

The ICT has impacted on all spheres of life, libraries are no exception. In the present digital era, all types of libraries are expected to embrace new information and communication technologies. Only those libraries having human resources equipped with modern ICT competencies can satisfy users' information needs effectively. LIS schools are required to develop students' ICT skills in accordance with needs of the information market so that they can be absorbed into the workforce. The findings suggest that LIS graduates' ICT skills were not adequate to meet the job market needs. The majority of graduating students had an intermediate ICT skills level, while a small number of students were proficient. LIS schools had not adequately trained them to apply ICT skills. The students possessed theoretical knowledge and basic skills of ICT. There was a gap between the market needs and ICT skills possessed by the graduates. The students lacked a number of advanced/library-specific ICT skills required by the job market. Deficiencies in LIS curricula, the lack of practical training, the paucity of faculty teaching ICT courses and meager ICT facilities were the main factors which impeded the development of students' ICT skills. LIS schools need to redesign their curricula by incorporating the contents in ICT courses in accordance with the market needs, and provide practical training by improving teaching faculty and ICT facilities. It will not only enhance students' employability but also help to develop libraries in the country by keeping pace with technological innovations. The percentage of the research objectives achieved is presented in Table 11 below.

Table 11

Percentage of the research objectives achieved

S. N.	Research Objective	% of the Objective Achieved
1	To investigate the current level of LIS graduates' ICT skills in the Punjab	100.0
2	To explore the effectiveness of ICT skills training provided by LIS schools in developing students' ICT skills	100.0
3	To identify the factors hindering development of students' ICT skills	100.0
4	To identify LIS job market needs for ICT skills in the Punjab	100.0
5	To compare LIS graduates' ICT skills with the job market needs in the Punjab	100.0

RECOMMENDATIONS

On the basis of findings of the study, the following recommendations are made:

1. LIS schools need to review and redesign their curricula by incorporating the contents in ICT courses in line with the needs of the job market on a regular basis, and provide ICT training to students accordingly.
2. LIS schools should devise a mechanism through which they can liaise with LIS employers on a regular basis to ascertain their needs for ICT skills.
3. LIS schools need to provide practical training in ICT to students instead of merely theoretical knowledge, so that students are enabled to practice ICT skills effectively. The schools should keep in view the students' preferred mod while providing them practical training.
4. LIS schools should appoint faculty members with education in computer science/information technology to teach ICT courses. Faculty members already teaching ICT courses should improve their competence so that they can properly train students.
5. LIS schools need to establish, upgrade and maintain their ICT labs, and improve other ICT facilities, such as, Internet speed, and Wi-Fi

connectivity. The schools should hire technical staff to maintain their ICT labs.

6. LIS schools, library associations and organizations in the country should conduct training courses, seminars, workshops on the latest ICT skills for LIS students and professionals to improve their ICT competencies.

DELIMITATION

The population for the quantitative study comprised LIS graduates of the master's programme at LIS schools offering on-campus education in public universities in the Punjab. Students of the bachelor's programme and diploma in LIS have been excluded from this study as some of library schools included in the study were not offering these programmes.

LIMITATION

The findings relating to students' ICT skills are limited to LIS graduates of the on-campus master's programme offered by LIS schools in public universities in the Punjab and cannot be generalized to the graduates of other LIS programmes.

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