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## INFORMATION AND COMMUNICATION TECHNOLOGY KNOWLEDGE AND SKILLS OF LIBRARIANS IN THE CHANDIGARH CITY LIBRARIES

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### Abstract

Increasing use of technology as a means of accessing information and the recent shift towards cooperative learning and group study have brought changes in the way patrons use libraries and library resources. This article is based on the part of a survey that investigated the ICT knowledge and skills of librarians at the Chandigarh City. A study population of 21 librarians of Chandigarh city were surveyed by a questionnaire to establish in what ways librarians were using ICTs, what were the level of ICT knowledge and skills amongst the librarians, what problems the librarians faced in the use of ICTs and what their ICT training needs were. Interpretation of the results revealed a low level of ICT knowledge and skill amongst librarians and a general lack of formal training for ICTs amongst the academic librarians.

**Keywords :** Information Literacy/ ICT/ Librarianship

### 1. Introduction and Statement of Problem

Libraries have undergone considerable change in the past decade. With increasing use of technology to organize and disseminate information, the computer has become an important tool for accessing information. Libraries not only have to provide the technology necessary for patrons to use their OPACs, but also must supply a means for access to scholarly digital resources and a growing number of electronic databases. The physical space in libraries has been modified to accommodate the additional technology necessary to provide patrons with the tools to use library resources successfully and to meet their information needs. The librarian's role has changed rapidly in recent years, in response to new forms of information and new methods of teaching and learning. Increased patrons numbers have spread existing staff more thinly; widening modes of access have brought in more part time patrons; more patron centered learning demands a greater variety of teaching skills; and the explosion of electronic information (from CD-ROM to the Internet) requires continuous updating of knowledge and skills (Bluck, 1996).

Furthermore, patron expectations of the ability of a library service to deliver high quality services are growing. Linked to user demands for services is the influence of information technology (IT). Patrons, for example, are becoming more computer literate and the library environment has changed substantially in the increased variety of technology used for service delivery. If users wish to be more independent in their search for information, user education in the use of information systems and databases is very important. Bluck (1996) argues that:

The changes due to new technology and information systems mean that all academic/information librarians will be expected to master “navigational skills” to get through electronic databases and show others how to do so. Also, continued financial constraints have placed greater pressure on collection development policies, and given impetus to the move towards networked information in electronic format. Therefore, to perform their roles effectively and efficiently in such a demanding electronic environment academic librarians have to possess the necessary ICT knowledge and skills.

The purpose of the study was to investigate the ICT knowledge and skills of librarians at the Chandigarh city libraries. The specific objectives of the study were to: investigate the ways in which the librarians are using ICTs, establish the level of ICT knowledge and skills amongst the librarians, identify problems the librarians faced in the use of ICTs and to identify the librarians ICT training needs.

## **2. Literature Review**

The literature was searched for previous studies investigating the range and level of technology in libraries around the world and for studies focusing on computer literacy and ICT skills requirements of librarians. Little was found to supplement the interpersonal computer skills, knowledge of sources, search strategies and educational or technical skills.

### **2.1 Defining computer literacy**

Computer literacy is the ability to use microcomputers confidently for obtaining needed information, solving specific problems, and performing data-processing tasks. This includes a fundamental understanding of the operation of microcomputers in general, as well as the use of several types of application software packages (Van Vliet, Kletke and Chakraborty 1994).

In this definition, the ability to use microcomputers confidently means that a person has the ability to respond via keyboard, and perhaps a mouse, to questions or other types of communication that might be part of software programme. The fundamental understanding of microcomputer operations in general includes a basic comprehension of an operating system and the ability to perform routine tasks such as looking at directories of diskettes or copying a file. Application packages that are now part of the computer literate person’s repertoire are word processors, spreadsheets, and perhaps, database management systems.

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## 2.2 ICT via Library

Librarianship is purported to have changed more over the last few decades than in its entire previous history. The factors affecting such change may be divided into four categories: economics, technological, higher education and organizational (Farley, Broad-Preston and Hayward 1998). The wide spread use of ICT in libraries, and especially the development and access to digital information resources via the Internet, has raised a number of challenges and concerns for librarians. These include the impact of ICT on the role of librarians and the resulting need for new skills and competencies suitable for the digital information environment. According to Chisenga and Rorissa (2001) the role of librarians in the digital information environment is evolving. Librarians are now being expected to possess skills and expertise, in addition to the traditional library and information management skills specifically in the use of ICT, electronic publishing, digital information management and knowledge management.

Technological changes have resulted in librarians constantly questioning their future and the competencies they will need to survive professionally (Woodsworth 1997). Job advertisements today give some clues as to the skills required. A study conducted by Zhou (1994) which investigated the market change regarding the demand for computer literacy for librarians in academic and public libraries in the United States from 1974 to 1989, revealed that computer applications have changed in many aspects the ways by which libraries provide services. As a result, computer literacy has gradually become an important competency for librarians in many positions.

Woodsworth (1997) suggests that technological competencies are the most critical ones for all librarians, even if they obtained their professional credentials as recent as the early 1990s. Basic competencies for librarians must include knowing what the Internet is and is not; evaluating and using hardware, software, and networks; and understanding basic computer and information science concepts. According to Marmion (1998) the biggest technology challenge facing the library profession today is that of preparing our employees to use technology effectively. To meet this challenge, libraries must pay much more attention to technology training and computer skills than they traditionally have in the past. Computers, connectivity, and electronic information are redefining the library profession and what librarians do. According to Latham (2000) technical literacy is no longer a specialty but a survival skill for all librarians. While this skill rapidly obtained a name, "computer literacy", little consensus has been developed on precisely what set of abilities it actually represents.

## 2.3 ICT Skills for Librarians

Krissof and Konrad (1998) argue that for librarians or users to consider them truly information literate in this day and age, it is essential that they develop both traditional literacy skills and fundamental computer literacy skills. Latham (2000) argues that every librarian should be familiar with all components of an office suite: word processing, spreadsheets, databases, and scheduling programmes. Further, librarians should be able to choose the appropriate application for the anticipated result, that is, a database

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for lists repeating the same type of information, spreadsheets for tracking numerical data, word processing for forms, for instance. Library staff, for that matter, should be able to make use of the extended capabilities of an application: to create charts, import graphics, and attach files, and so forth. They should know what is attached to their CPU, and how it is attached, and they should be able to perform basic troubleshooting functions: power source, monitor adjustments, reboots, printer response, and how to write down error messages.

All librarians should be familiar with installing, configuring, and using a browser and should be able to discuss intelligently their favorite search engines on the Web and explain why they use each one. Librarians should also be able to discuss when a Web search is preferable to a print search, and vice-versa. Beyond the functionality, however, we need to look at ways to use e-mail to expand communications within the organization, particularly large organizations. Due to the penetration of standards, all staff should be familiar with whichever version of Windows is run within the organization, how to navigate through Windows (with and without a mouse), and how to manage files associated with Windows (Latham 2000). Librarians who are Webmasters need to have a working knowledge of HTML (Hyper Text Markup Language), tables, browsers, graphic placement, CGI (Common Gateway Interface) programming, UNIX and Java (Saunders-McMaster 1997). The challenge facing libraries is to get their librarians up to speed and to master the tools they use in working with electronic information. According to Marmion (1998) while many individuals, and even some institutions are already there, as a profession librarianship is not. Many research libraries, even, are not. Ongoing training is necessary if today's libraries are to keep up with changing technology:

### **3. Methodology**

The evolution, development and advances in modern ICTs have brought in a dramatic and an unprecedented revolution in library profession and practice. This study seeks to answer question pertaining to the reaction of academic library environment in Chandigarh city libraries to these phenomenal and global changes in the practice of librarianship. In other words, the study investigates the extent of adoption of ICT in Chandigarh city libraries as modern tools of providing library services to users in the global setting. The study covered the college and public libraries in Chandigarh. Some other academic and research libraries such as the Panjab University Chandigarh and Panjab Engineering College were excluded from the study, as including them would have been too large a task for the requirements of the level of research that was undertaken. The study targeted librarians and the technology investigated was limited to the use of personal computers. The population consisted of 21 academic and public librarians at the Chandigarh city libraries.

A Survey was the instrument used to collect data from all the librarians in both college and public libraries in Chandigarh City. Two methods were used in this survey these were: (1) gathering, organizing and reviewing available literature to provide background information; and (2) a questionnaire for indepth study to obtain the state-of-the-art on ICT knowledge and skills. Small size of the population made sampling unnecessary. A

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self-administered questionnaire was used for collecting the data. The self-administered questionnaire was designed to establish the ICT knowledge and skills of librarians at the Chandigarh city libraries. The questionnaire consisted of 9 sections designed to establish general information about the academic librarians as well as specific information relating to their ICT knowledge and skills. These sections were as follows: Respondent's background; File management; Windows / keyboard; Word processing; Spreadsheet; Databases; Presentations; E-mail and Internet.

Questions in each of these sections tested the respondent's knowledge and skills regarding their performance of specific operations. Questions relating to training and the problems respondents had with each section or application were also included. In this study closed questions, which forced the respondents to choose between a "yes", "No" and "uncertain" option were used. The type of data collected, the purpose for which the study was conducted, and to meet the study's objectives determined the methods for data analysis. The data relating to limited option questions was then processed in terms of frequency counts and percentages. Content analysis, done manually, was used to interpret the responses to open questions

#### **4. Results and Discussion**

In line with the intentions of the research the results are reported for the demographics of the population and each of the objectives of the study.

##### **4.1 The ways in which the Academic Librarians were Using ICTs**

**Home computer use :** Most of the librarians 18 (86%) had access to a home computer, while three (14%) did not. These home computers were used for word processing 11(53%), Internet access 6(29%) and e-mail 4(19%)

**Work Computer Use :** A majority of the librarians 19(90.5%) used a computer in the course of their duties or tasks at work, while two (9.5%) did not. Librarians used a work computer for database searching 16 (76%), information retrieval 15(71%), word processing 11(52.4%), e-mail 6(28.6%), internet access 3 (14.2%), cataloguing 2 (19.52%) and user education 7 (33.3%). Almost all the librarians 19 (90.5%) had their own work computer, except 2 (9.5%) of the respondents who shared a computer with colleagues. Since computers have assumed a central role in the library profession over the past years, most of the librarians used a computer to perform their tasks and duties. Therefore to perform their tasks and duties efficiently, academic librarians must have the necessary ICT knowledge and skills.

##### **4.2 The Level of ICT Knowledge and Skills amongst the Academic Librarians**

File Management Functions and Operations

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Table I Functions relating to file management N = 21

Function	NO		Yes		Uncertain		No Response	
	Count	%	Count	%	Count	%	Count	%
Daily	22	55	14	35	20	50	4	10
Identify drives	1	4.76%	17	80.95%	2	9.52%	1	4.76%
Move around directories	1	4.76%	19	90.47%	1	4.76%		
Saving a file	1	4.76%	20	95.23%				
Copying a file	1	4.76%	20	95.23%				
Naming files	1	4.76%	20	95.23%				
Locating files	1	4.76%	17	80.95%	2	9.52%	1	4.76%
Creating a directory	1	4.76%	17	80.95%	2	9.52%	1	4.76%
Search for files	2	9.52%	12	57.14%	3	14.28%	4	
Use of anti virus	6	28.57%	9	42.85%	3	14.28%	3	14.28%

The majority of the librarians could copy, save and name a file from a drive (20 or 95.23%) while 19 (90.47%) could move around directories. 17 (80.95%) could identify drives; locate files and create directory. While 12 (57.14%) could search for files and only 9 (42.85 %) could use anti virus soft wares.

Table 2. Functions related to Windows, Mouse and keyboard N = 21

Function	No		Yes		Uncertain	
	Count	%	Count	%	Count	%
Use of mouse			21	100%		
Double click and drag			21	100%		
Identify Icon			21	100%		
Select, open icon			21	100%		
Maximize and minimize			21	100%		
Name document			21	100%		
Save document			21	100%		
Re-name document			21	100%		
Exit from application			21	100%		
Use of scroll bars			21	100%		
Work with more than one application			20	95.23%	1	4.76%
Use of control panel			19	90.47%	2	9.52%
Use of shortcut keys	1	4.76%	18	85.71%	2	9.52%
Use of function keys	1	4.76%	18	85.71%	2	9.52%

All of the subject librarians (21 or 100%) were able to use a mouse; double click and drag; identify icons; select open icon; maximize and minimize; name, re-name; exit from application and use scroll bars. While 19 (90.47%) could work with more than one application and 18 (85.71%) could use shortcut and function keys.

Table 3 Functions Relating to Word Processing N = 21

Function	No		Yes		Uncertain	
	Count	%	Count	%	Count	%
Use of mouse			21	100%		
Open file			21	100%		
Copy, move text			21	100%		
Save a file			21	100%		
Close a file			21	100%		
Create a file			20	95.23%	1	4.77%
Change font size			20	95.23%	1	4.77%
Change font style			20	95.23%	1	4.77%
Use save as			21	100%		
Change line spacing			19	90.46%	2	9.54%
Use spell check	2	9.54%	19	90.46%		
Set margins			18	85.71%	3	14.29%
Add tables	2	9.52%	17	80.95%	2	9.52%
Use thesaurus	1	4.77%	17	80.95%	3	14.28%
Add clipart	2	9.52%	16	76.19%	3	14.28%
Create header or footer	3	14.28%	15	71.42%	3	14.28%
Set tabs	1	4.77%	15	71.42%	5	23.8%

All of the Librarians (21 or 100%) could open file; copy, move text; save a file; close a file; use save as while 20 (95.23%) could create a file; change font size; change font style; 19 (90.46%) could change line spacing; use spell checker. While 18 (85.71%) could set margins and 17 (80.95%) could add tables and use thesaurus; 16 (76.19%) could use clip art 15 (71.42%) could create header or footer and set tabs. Librarians responded to all the questions relating to word processing functions and operations.

**Word Processing Software**

Microsoft Word was used by all, i.e.21 (100 %) librarians.

Table 4 Functions Relating To Spreadsheets N = 21

Function	NO		Yes		Uncertain		No Responsc	
	Count	%	Count	%	Count	%	Count	%
Enter data	4	19.04%	15	71.42	2	9.52%		
Interpret info. In spreadsheet	6	28.57%	11	52.38%	4	19.04%		
Create rows, Co- lumnns, headings	5	23.80%	11	52.38%	4	19.04%	1	4.76%
Insert into word processing	5	23.80%	10	47.61%	6	28.57%		
Create tables and values	5	23.80%	11	52.38%	5	23.80%		
Create a graph	5	23.80%	10	47.61%	5	23.80%	1	4.76%
Format a cell or range	6	28.57%	9	42.85%	5	23.80%	1	4.76%
Insert columnns and rows	6	28.57%	9	42.85%	5	23.80%	1	4.76%
Use gridlines, headers, footers	6	28.57%	7	33.33%	6	28.57%	2	9.52%
Use hiding, free- zing / splitting	6	28.57%	7	33.33%	6	28.57%	2	9.52%
Create formula	6	28.57%	5	23.80%	5	23.80%	5	23.80%

Most of the librarians (15 or 71.42 %) could enter data followed by 11 (52.38 %) who could interpret information in spreadsheet; create rows, columns, headings and create tables and values. Less than half 10 (47.61%) could insert into a word processing document and create a graph; 9 (42.85 %) could format a cell or range and insert columns and rows; 7 (33.33 %) could create gridlines, headers, footers and use hiding, freezing / splitting. Only 5 (23.80 %) could create a formula using functions.

### Spreadsheet Software

Microsoft Excel was used by all, i.e.21 (100 %) librarians.

Table 5 Functions Relating To Databases N = 21

Function	No		Yes		Uncertain	
	Count	%	Count	%	Count	%
Enter data	19	90.47%	2	9.52%		
Add a record	19	90.47%	2	9.52%		
Delete record	19	90.47%	2	9.52%		



Sorting	19	90.47%	2	9.52%		
Search with Boolean operators	19	90.47%	2	9.52%		
Report creation	19	90.47%	2	9.52%		
Insert files into word processing documents	19	90.47%	1	4.76%	1	4.76%
Create report with summaries	19	90.47%	1	4.76%	1	4.76%

Only two (9.52 %) of the librarians could enter data; add a record; delete a record; sort records; search using “and”, “or” or “not”; create report. Similarly, only one (4.76 %) could insert files into word processors and create report with summaries.

**Database Software**

Microsoft Access was used by all, i.e.21 (100 %) librarians.

*Table 6 Functions Relating To Presentations N = 21*

Function	NO		Yes		Uncertain		No Responsc	
	Count	%	Count	%	Count	%	Count	%
Enter data	4	19.04%	15	71.42	2	9.52%		
Create and edit a slide	4	19.04%	14	66.66%	2	9.52%	1	4.76%
Duplicate a slide	4	19.04%	14	66.66%	2	9.52%	1	4.76%
Chose layouts of slides	4	19.04%	14	66.66%	2	9.52%	1	4.76%
Add text &images	4	19.04%	14	66.66%	2	9.52%	1	4.76%
Use cut and paste to move a slide	4	19.04%	14	66.66%	2	9.52%	1	4.76%
Rotate or flip an object	4	19.04%	13	61.9%	2	9.52%	2	9.52%
Change attributes, colors of shapes	4	19.04%	13	61.9%	2	9.52%	2	9.52%
Create organiza-tional charts	4	19.04%	13	61.9%	2	9.52%	2	9.52%
Preview using various views	4	19.04%	14	66.66%	2	9.52%	1	4.76%
Re-order slides	4	19.04%	13	61.9%	2	9.52%	2	9.52%
Add notes to slides	4	19.04%	12	57.14%	3	14.28%	2	9.52%
Add preset animation effects	4	19.04%	14	66.66%	2	9.52%	1	4.76%
Use on screen navigation	4	19.04%	12	57.14%	3	14.28%	2	9.52%

Only 14 (66.66 %) of the librarians could create and edit a slide; duplicate a slide; chose layouts; add text and images; use cut and paste to move a slide; preview using various views and add preset animation effects. 13 (61.9 %) could Rotate or flip an object; change attributes, colour, shapes; create organizational chart and re-order slides. While 12 (57.14 %) could add notes to slides; use on screen navigation.

### Presentation Software

Microsoft PowerPoint was used by 19 (90.47%) of the librarians, while two (9.53%) used Corel Presentations.

Table 7 Functions relating to e-mail N = 21

Function	No		Yes		Uncertain	
	Count	%	Count	%	Count	%
Create an e-mail account			21	100%		
Compose send e-mail			21	100%		
Retrieve read e-mail			21	100%		
Reply, forward e-mail			21	100%		
Save, print, delete e-mail			21	100%		
Open an attachment			21	100%		
Attach a file			20	95.23%	1	4.76%
Create and manage folders	1	4.76%	19	90.47%	1	4.76%
Create & manage address book	1	4.76%	19	90.47%	1	4.76%
Subscribe to mailing lists/ listserv	1	4.76%	16	76.19%	4	19.04%

All of the librarians (21 or 100%) could create, compose and send e-mail; retrieve, read e-mail; reply, forward e-mail; save, print, delete e-mail; open an attached file. While 20(95.23 %) could attach a file, 19 (90.47 %) could create and manage folders and address book; and 16 (76.19 %) could subscribe to list / listserv.

Table 8 Functions relating to the Internet N = 21

Function	No		Yes		Uncertain	
	Count	%	Count	%	Count	%
Create an e-mail account			21	100%		
Locate a source from an URL			21	100%		
Use of search history			21	100%		
Use of search engines			21	100%		
Use of navigation buttons			21	100%		
Create a bookmark	1	4.76%	20	95.23%		
Use bookmark to access sites	1	4.76%	20	95.23%		
Download from a site	1	4.76%	19	90.47%	1	4.76%
Identify hyperlink	1	4.76%	19	90.47%	1	4.76%

All of the librarians (21 or 100%) could locate source from an URL; use search history; use a search engine; use navigation buttons. While 20 (95.23%) could create bookmarks; use bookmarks to access sites, 19 (90.47 %) could download file from a site; Identify hypertext link.

**Internet Software or Browsers**

Internet Explorer was used by 19 (90.47%) of the librarians while two (9.53%)used Netscape Navigator.

*Table 9 Functions relating to setup, maintenance and troubleshooting N = 21*

Function	NO		Yes		Uncertain		No Responsc	
	Count	%	Count	%	Count	%	Count	%
Connect peripheral devices	4	19.04%	15	71.42%	1	4.76%	1	4.76%
Protection and care of disks	4	19.04%	15	71.42%	2	9.52%		
Install a application	6	28.57%	10	47.61%	3	14.28%	2	9.52%
Remove a application	6	28.57%	10	47.61%	3	14.28%	2	9.52%
Protection against viruses	6	28.57%	9	42.85%	3	14.28%	3	
Upgrade an application	6	28.57%	9	42.85%	3	14.28%	3	
Cleaning computer and printer	10	47.61%	6	28.57%	3	14.28%	2	9.52%

Most subject librarians (15 or 71.42 %) were able to connect peripheral devices know about protect and care for disks. Less than half (10 or 47.61 %) could install an application; remove a application, 9 (42.85 %) knew about protection against viruses and could upgrade an application. 6 (28.57 %) could clean computer, printer.

Librarians performed well in terms of the functions and operations for the following applications: file management, databases, windows and keyboard, word processing, e-mail and Internet. However, they did not perform well in terms of the functions and operations for the following applications: spreadsheets, presentations, set-up, maintenance and troubleshooting. From the literature it is clear that librarians have to be familiar with all the above applications functions and operations in order for them to perform their roles effectively and efficiently in a demanding electronic environment that is constantly changing (Latham 2000; Marmion 1998). Given the fact that the majority of the librarians use a computer in the course of their duties or tasks, there is an under utilization of these resources due to a lack of knowledge and skills. Therefore, the potential benefits and advantages of using such resources were not being realized.

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### 4.3 Problems the Librarians Faced in the Use ICT

**File Management :** Two (9.52%) librarians experienced problems with ordering of files. While three (14.28%) had problems with understanding the difference between drives and directories; understanding file management concepts; understandings the purpose of file management; understanding terminology and locating files are using DOS.

**Word Processing and Spreadsheet :** While two (9.52%) had problems with indenting in Microsoft Word and one (4.76%) with setting tabs and inserting date and time. Spreadsheet four (19.04%) librarians experienced problems such as no training, while three (14.28%) forgot functions that were not used often and one (4.76%) had problems with transferring data and formulas.

**Database and Presentations :** All 21 (100%) librarians did not respond to the question relating to database problems.

Presentations Three (14.28%) librarians experienced problems with a need for more training, while four (19.04%) never used presentations; was unfamiliar with all the functions and found the clipart difficult to use.

**E-mail and Internet :** Four (19.04 %) librarians experienced problems with viruses; slow delivery, while one (4.76 %) had problems with opening attachments.

Internet Three (14.28%) librarians experienced problems with slowness, while six (28.57 %) had problems with outdated websites and sites that disappeared.

**Set-Up, Maintenance And Troubleshooting :** Ten (47.61%) librarian experienced problems with keeping pace with change; support from IT supplier's staff was not prompt; understanding computer jargon; ignorance; lack of training and a lack of knowledge and understanding. Unfortunately, a majority of the librarians did not respond to the question about problems they had experienced in each of the above sections. It should therefore not be assumed that most librarians had no problems as the quantitative data may suggest. The few who indicated problems experienced them as a result of lack of knowledge, understanding and training.

### 4.4 The Academic Librarians ICT Training Needs

More than half of the librarians 12 (57.14%) had no formal training in ICT. It can be argued that this lack of training would influence the librarians' level of ICT knowledge and skill. There were, however, exceptions to this observation. Even though there was a lack of formal training for file management, windows and keyboard, word processing, e-mail and the Internet, the librarians' level of knowledge and skill were high for these applications. Also, in examining the courses attended by academic librarians, most of these courses were introductory courses; none of the academic librarians had attended intermediate or advanced courses.

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## 5. Conclusion and Recommendations

The recent advances in ICTs have strengthened further the link between knowledge and broad based development and the “knowledge revolution” provides an opportunity to foster access to basic library services and improved education outcomes. Thus effective adoption of ICT in libraries in Chandigarh city will accelerate the level of knowledge acquisition and consequently improve national development.

The survey of 21 librarians resulted in several significant findings. The study was able to establish the level of ICT knowledge and skills among the librarians and to make recommendations regarding the addressing of problems that were revealed. As was to be expected the majority of the librarians used a computer in the course of their duties or tasks at work. The findings of the study showed that librarians generally do not have the knowledge to explore and take advantage of the opportunities technology creates, nor did they have the skill or ability to perform the applications functions and operations described above effectively. In conclusion, by identifying the problems that librarians face in the use of ICT it is evident from the findings that the majority of these problems were as a result of a lack of understanding, knowledge, skill, and above all, as discussed above, a lack of training. Therefore, in an attempt to remedy this situation, the study made the following two broad recommendations with regard to education and staff training and development.

### 5.1 Education

Library schools should provide a curriculum that is balanced in the sense that it provides for an education in traditional librarianship as well as ICT knowledge and skills. With regard to the ICT knowledge and skills education, such an education must be user centered, and ICT must be viewed as a means not an end to promote a quality, efficient and effective service to library patrons. Also, such a curriculum must provide for continuing education so that librarians can update their ICT knowledge and skills to keep pace with ever changing technological developments.

### 5.2 Staff Training and Development

Library management in all the libraries under study needs to realize the value of staff development and training for their library. Management should ensure all their staff be able to cope with changes that have resulted from technological developments. The magnitude of change due to technological developments suggests that libraries have to devote greater resources to staff training and development. Management will have to make a commitment to staff training and development to ensure that staff has the necessary ICT knowledge and skills to work effectively in an environment that is demanding and rapidly changing.

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