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ICT Skills among Librarians in Engineering Educational Institutions in Tamil Nadu

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ABSTRACT

Library and information professionals today need to acquire knowledge and skills in information and communication technology (ICT) as the services of more and more libraries are now centering around information technology, especially in educational institutions. Application of ICT in academic environment in India has increased gradually in the recent decades, more particularly in Tamil Nadu. This paper examines the ICT skills among librarians in engineering educational institutions in Tamil Nadu. The analysis of the data represents the extent and the level of ICT skills possessed by the librarians of these institutions.

Keywords: ICT, engineering educational institutions, librarians, ICT skills, Tamil Nadu

1. INTRODUCTION

Developments in the ICT have made profound changes in each and every field. These developments are also known as computer/information/communication/Internet/ multimedia revolution, binary age, information age, information society, information superhighway, and digital age. The changes are evident all over the world, and its effects being felt in every walk of life and in every field of knowledge. The field of library and information science (LIS) is also not an exception to this phenomenon.

In the changing environment, every library grows in terms of reading material, equipment, space, staff, readers, etc. The library and information scenario is changing at a dynamic pace; there is a paradigm shift from print media to web media; from ownership of documents to access to information; intermediary to end-user model of services; and from location of specific libraries to digital/virtual/hybrid

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libraries. Similarly, there is a change in the needs and interests of the readers. Hence, the role of library and information professionals has also changed dramatically. To meet the current requirements, library professionals must be able to perform various tasks coping up with the changes in technological environment.

This paper aims to present the ICT skills possessed by the librarians working in the universities, deemed universities, government colleges, government-aided colleges, and self-financing engineering colleges of Tamil Nadu.

1.1 Engineering Education in Tamil Nadu: An Overview

Tamil Nadu is one of the constituent state of Indian Republic. The first and foremost engineering college in Tamil Nadu, College of Engineering (now named as Anna University), Guindy, Chennai (formerly Madras), was established in 1886. This was followed by a number of colleges established by the state government, government-aided, and self-financing managements. At present, there are about 255 engineering educational institutions in Tamil Nadu out of which 222 colleges are in self-financing category. There are six engineering educational institutions exclusively for women also.

These institutions can be classified as the universities (3), deemed universities (14), government (13), aided (3), and self-financing engineering colleges (222). Some of the leading and self-financing engineering colleges established in the early eighties have been elevated to the status of deemed universities. They are Vellore Institute of Technology, Vellore; Sathyabhama Institute of Science and Technology, Chennai; Shanmugha Arts, Science, Technology and Research Academy (SASTRA), Tanjore; Amritha Institute of Technology and Science, Coimbatore; Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore; Bharat Institute of Science and Technology, Chennai; Dr M.G.R. Engineering College, Chennai; S.R.M Institute of Science and Technology, Kattankulathur; Sri Chandra-sekharendra Saraswathi Visva Mahavidyala, Kancheepuram; Karunya Institute of Technology, Coimbatore; and Vinayaga Mission, Salem.

2. OBJECTIVES OF THE STUDY

The study was conducted to:

- Survey the engineering educational institutions in Tamil Nadu with regard to the background information about the institutions and librarians.
- Identify the types of ICT skills possessed by the librarians under study.
- Assess the level/extent of different types of ICT skills possessed by the librarians under study.
- Study the means and methods of acquiring ICT skills by the librarians under study.
- Identify the constraints in acquiring ICT skills by the librarians.

3. HYPOTHESES

The study is based on the following hypotheses:

- Managerial skills, subject skills and technical skills are at satisfactory level among the library professionals in engineering educational institutions in Tamil Nadu.
- Librarians adopt varied means and methods to acquire ICT skills.
- Librarians face obstacles in acquiring ICT skills.

4. LIMITATIONS

- The study considered only 171 librarians of engineering educational institutions in Tamil Nadu, although there are about 255 institutions.
- The study did not compare the ICT skills among the male and female librarians.
- The study did not attempt to compare the ICT skills of the librarians by the nature of management.

5. RELATED RESEARCH

Review of the literature shows a few studies on skills of the library professionals published in India and other countries. Marion[1] analysed the online employment advertisements to determine current professional requirements for technologically oriented jobs. Prathiba Naran[2] has outlined the skills of the librarians, which make them suitable for a variety of positions in the diverse fields such as software, database and information area, publishing trade, and outsourcing opportunities. Kumaresan[3] projected the emerging scenario of LIS professionals in the Indian environment and emphasised the future challenges of the librarians with added knowledge of network and information retrieval systems. Jones[4] stressed the importance of IT literacy for the professionals working in library and information centres. Nick Joint[5] stated that the skills required in the digital libraries are more heterogeneous, fluid, and fast changing. He emphasised the needs of different training philosophy with constructive approach to teaching and learning which digital library training might also include.

Shiholo and Ocholla[6] outlined the changing trends of training needs of informational professionals in Kenya and argued that core knowledge and skills for information providers have to be reviewed regularly. Nyamboga, *et al.*[7] surveyed the skills of professionals working in the university libraries in Kenya. Nyamboga[8] also examined the training opportunities for library and information professionals in India and stressed the need for developing information skills and information literacy programmes. Rajalakshmi[9] outlined the skills required by the LIS professionals in the 21st century in the context of ICT implications.Bawden, *et al.*[10] examined the approach to the education and training of librarians in digital libraries and the competencies required for creating and managing digital libraries, and assessed these competencies *vis-à-vis* LIS education in the UK and Slovenia. Kannappanavar and Kumbargoudar[11] analysed the management skills in the light of ICT among LIS professionals in agricultural universities in India. There are few surveys conducted in libraries in India in the recent decade, but not a single study of ICT skills of librarians in Tamil Nadu has been reported.

6. METHODOLOGY

A questionnaire was designed to fulfil the stated objectives. The selection of the library professionals for the study was based on the assumption that they possess knowledge of the following skills:

- Operating systems.
- Packages and programming languages.
- Knowledge of library automation software.
- Web awareness.
- Knowledge of online facilities/services.
- Technical skills.
- Managerial skills.

7. ANALYSIS AND DISCUSSION

7.1 Sample Size

Two hundred twenty-five questionnaires were distributed among different categories of engineering institutions in Tamil Nadu. The responses have been classified in the Table 1. Out of 225 questionnaires, 171 were responded. A majority of them (161) were from the self-financing institutions.

7.2 Background Information about the Libraries Surveyed

Out of 171 libraries surveyed, 42.1 per cent were established during 1996 and 2000. Nearly one-fourth of these were established at the beginning of the new millennium. By and large, about one-third of the samples were established before 1995.

Only 77 engineering educational institutions have been certified by the agencies like the International Organisation for Standardisation (ISO), or the National Board of Accreditation (NBA) of the All India Council of Technical Education (AICTE), or both. In India independent accrediting agencies (NAAC, NBA) evaluate

Table 1. Distribution of questionnaires and responses received

	No. of questionnaire distributed	Responses received
Universities	3	1
Deemed universities	10	5
Government colleges	5	2
Government-aided colleges	3	2
Self-financing colleges	204	161
Total	225	171

higher educational institutions on the basis of their strengths in curricular aspects, teaching methodology, research facilities, infrastructure, and student-support mechanism. While NAAC grades arts and science colleges and universities, NBA offers accreditation to the institutions offering courses in engineering, management, architecture, pharmacy, hotel management, and country planning. Table 2 shows that engineering educational institutions in Tamil Nadu are keen in getting accredited either by a national agency or by an international organisation to exhibit quality and competition. The libraries of these institutions have varied collection such as printed books and journals, and also e-collections such as e-books, CD ROM products, e-journals, and e-project reports.

Table 2. Background information about the institutions in Tamil Nadu

	No. of institutions	Per cent
Year of Establishment		
Before 1980	4	2.3
During 1981–1985	20	11.7
During 1986–1990	5	2.9
During 1991–1995	29	17.0
During 1996–2000	72	42.1
After 2000	41	24.0
Courses Offered		
UG level	80	46.8
PG level	78	45.6
UG, PG and PhD	13	7.6
Institution Certification		
ISO	21	12.3
NBA	18	10.5
ISO and NBA	38	22.2

7.3 Background Information about the Librarians

One hundred and forty-two professionals, out of 171 respondents have postgraduate qualifications. One hundred ten persons are holding MPhil as professional qualification (six out of them have PhD degree also). Their professional experiences range from 5 to 15 years (Table 3). One hundred and thirty-nine respondents were in the age group of less than 40 years. However, seven out of 171 librarians were above 50 years (Table 4).

7.4 IT Skills of the Librarians

The survey was aimed to know the level of ICT skills possessed by the respondents. Data in the Tables 5 to 11 shows the knowledge of librarians about operating systems, software

Table 3. Qualifications and experience of the respondents

	No. of Librarians	Per cent
Academic Qualifications		
UG	24	14.0
PG	142	83.0
MPhil	5	2.9
Professional Qualifications		
MLISc	55	32.2
MPhil in LIS	110	64.3
PhD in LIS	6	3.5
Experience		
Below 5 years	66	38.6
Between 6–10 years	84	49.1
Between 11–15 years	66	38.6
Between 16–20 years	4	2.3
Between 21–25 years	5	2.9
Above 25 years	1	0.6

Table 4. Classification of the respondents according to age and sex

packages and programming languages, library automation software, web awareness and online facilities/services, besides the technical skills and managerial skills. The figures indicated in the tables show the total number of library and informational professional with ICT skills, who have been rated based on a five-point scale as fully known (5), known (4), uncertain (3), not known (2), and not at all known (1) (Table 5).

Table 5 shows that a majority of the library professionals were conversant with DOS and Windows since their weighted arithmetic mean (WAM) values are 45.87 and 42.66, respectively. Only few professionals possess skills in the UNIX and LINUX. It reveals that LIS professionals were familiar with popular operating systems such as DOS and Windows, a mandatory requirement for using PCs. Table 6 shows that the LIS professionals possess skills in as many as eight software packages and programming language, but the degree of skill varies. The professionals evinced interest and proficiency in MS-Office package such as MS-Word (48.7 per cent), MS-Excel (48.06 per cent), MS-Access (44.20 per cent), MS PowerPoint (43.33 per cent) with first four ranks, respectively.

Table 7 shows that the respondents have fair knowledge of library automation softwares. For online facilities most of library professionals were preferring OPAC/Web OPAC. About 39.2 per cent of them indicated that they were aware about these facilities, which is very essentials in today's environment. It was followed by CD ROM search; e-mail; Internet surfing and search engines.

Table 9 indicates the technical skills of the library professionals. It shows that creating a catalogue and metadata are the prime choices of the respondents. It is followed by OCR, user interface design and image technology. More than 55 per cent of the respondents were having fair knowledge of all managerial skills (Table 10).

Most of the respondents indicated their awareness of effective leadership and system management followed by resource management. But ranking based on WAM indicates that the resource management a prime priority of library professional is followed by effective leadership and systems management.

	Not at all known	Not known	Uncertain	Known	Fully known	Weighted arithmetic mean
DOS	10 (5.8)	63 (36.8)	8 (4.7)	88 (51.4)	2 (1.2)	45.87
Windows	5 (2.9)	28 (16.4)	13 (7.6)	97 (56.7)	48 (28.1)	42.66
Unix	48 (28.1)	72 (42.1)	--	50 (29.2)	1 (1.2)	26.47
Linux	59 (34.4)	101 (59.1)	2 (1.2)	9 (5.3)	0	20.47

Table 5. Respondents level of knowledge on operating systems

Table 6. Respondents' level of knowledge in software packages and programming languages

	Not at all known	Not known	Uncertain	Known	Fully known	Weighted arithmetic mean	Rank
MS-Word	10 (5.8)	--	4 (2.3)	80 (46.8)	77 (45.0)	48.7	**1**
MS-Excel	9 (5.4)	--	5 (2.9)	88 (51.5)	69 (40.4)	48.06	**2**
MS-Access	12 (7.0)	11 (6.4)	21 (12.3)	69 (40.4)	58 (33.9)	44.20	**3**
MS-PowerPoint	16 (9.4)	13 (7.6)	12 (7.0)	78 (45.6)	52 (30.4)	43.33	**4**
DBMS/RDBMS	31 (18.1)	51 (29.8)	30 (17.5)	49 (28.7)	10 (5.8)	31.27	**6**
CDS/ISIS/WINISIS/ WebISIS	15 (8.8)	17 (9.9)	38 (22.2)	100 (58.5)	1 (.6)	37.87	**5**
Pascal	44 (25.7)	69 (40.4)	40 (23.4)	11 (6.4)	7 (4.1)	25.40	**7**
C, C++	43 (25.1)	102 (59.6)	--	20 (11.8)	6 (3.5)	23.80	**8**

7.5 Means and Methods of Acquiring IT Skills

Table 11 shows that formal education, informal education (distance education), education through colleagues, self-study, training at work place, training by suppliers, attending IT programmes, and workshops were the main sources of acquiring ICT skills by the library professionals under the study. Self-study (74.9 per cent) is a popular mode among librarians as medium of learning and updating their knowledge and skills of ICT in the engineering educational institutional libraries. It is followed by methods such as attending workshops/seminars (74.3 per cent), through colleagues (65.5 per cent), and training at work place (63.7 per cent), etc.

Table 7. Respondents level of knowledge in library automation software

	No. of respondents	Per cent
Not at all known	0	0
Not known	0	0
Uncertain	0	0
Known	89	52
Fully known	82	48
Total	171	100

7.6 Constraints to Acquiring IT Skills

Table 12 depicts that work overload of the librarians (84.8 per cent) is the major constraint in acquiring ICT skills. This is followed by negative attitude of the higher authorities (69 per cent) and limited opportunities (56.7 per cent) in the second and third rank, respectively.

8. CONCLUSION

The study shows that the library and information professionals working in engineering educational institutions in Tamil Nadu in one way or the other are acquiring considerable basic skills in ICT. But they need to concentrate more on network-based services and digital library services. In order to enhance the ICT skills among library professionals few suggestions have been made here:

- Encouragement to librarians for upgrading ICT skills by the respective managements.

Table 8. Respondents level of knowledge about web awareness

	Not at all known	Not known	Uncertain	Known	Fully known	Weighted arithmetic mean	Rank
Internet surfing	--	--	--	136 (79.5)	35 (20.5)	47.93	**4**
Search engines	--	--	20 (11.7)	134 (78.4)	17 (9.9)	45.40	**5**
E-mail	--	--		123 (71.9)	48 (28.1)	48.80	**3**
Subject gateways	19 (11.1)	84 (49.1)	--	62 (36.3)	6 (3,5)	31.00	**7**
Electronic bulletin boards	34 (19.9)	82 (47.9)	--	52 (30.4)	3 (1.8)	28.07	**10**
Electronic documentary delivery services	35 (20.6)	50 (29.2)	32 (18.7)	44 (25.7)	10 (5.8)	30.47	**8**
CD ROM search	--	8 (4.7)	--	98 (57.3)	65 (38.0)	48.87	**2**
Use of OPAC/Web OPAC	--	--	--	104 (60.8)	67 (39.2)	50.06	**1**
HTML, PDF	26 (15.2)	27 (15.8)	46 (26.9)	63 (36.8)	9 (5.3)	34.33	**6**
Webpage design	44 (25.7)	70 (40.9)	--	42 (24.6)	15 (8.8)	28.47	**9**

Table 9. Respondents level of knowledge about technical skills

	Not at all known	Not known	Uncertain	Known	Fully known	Weighted arithmetic mean	Rank
Image technology	59 (34.5)	30 (17.5)	41 (24.0)	32 (18.7)	9 (5.3)	27.67	**4**
Optical character recognition (OCR)	49 (28.7)	48 (28.1)	--	55 (32.1)	19 (11.1)	32.10	**2**
Cataloguing and metadata	25 (14.6)	72 (42.1)	--	53 (31.0)	21 (12.3)	32.40	**1**
User interface design	50 (29.2)	52 (30.4)	--	56 (32.7)	13 (7.7)	29.53	**3**

- Library schools must change their curricula focusing on ICT such as digitisation/ digital libraries, etc.
- Support from the top management.

Library and information professionals globally are being affected by the pace of ICT developments as their roles keeps on changing. On the other hand ICT offers a number of new opportunities to library and informational professional. Librarians with appropriate ICT skills and technological expertise that focuses on the needs of the users/organisation will have ample opportunities in future.

Most of the opportunities are becoming available outside the traditional settings. These new roles include cybrarians, website

Table 10. Respondents level of knowledge in managerial skills

	Not at all known	Not known	Uncertain	Known	Fully known	Weighted arithmetic mean	Rank
Project management	36 (21.1)	20 (11.7)	--	96 (56.1)	19 (11.1)	37.0	**5**
Resource management	20 (11.7)	18 (10.5)	11 (6.4)	93 (54.4)	29 (17.0)	44.4	**1**
System management	23 (13.5)	19 (11.1)	--	104 (60.8)	25 (14.6)	40.1	**3**
Fund raising	28 (16.4)	26 (15.2)	--	95 (55.6)	22 (12.9)	38.0	**4**
Effective leadership	32 (18.7)	9 (5.3)	--	97 (56.7)	33 (19.3)	40.2	**2**

Table 11. Means and methods of acquiring ICT skills

	Frequency	Per cent	Rank
Formal education	106	62.0	5
Informal education (distance education)	88	51.5	7
Through colleagues	112	65.5	3
Self-study	128	74.9	1
Training at work place	109	63.7	4
Training by suppliers	94	55.0	6
Attending IT programs	82	48.0	8
Attending workshops/ seminars	127	74.3	2

Table 12. Constrains in acquiring ICT skills

	Frequency	Per cent	Rank
Financial problems	57	33.3	5
Overload of working hours	145	84.8	1
Library professionals not interested in learning IT knowledge	14	8.9	7
Higher authority is not interested to send their library professional to upgrade their IT skills	118	69.0	2
Lack of professional recognition	45	26.3	6
Limited opportunities	97	56.7	3
Lack of sufficient staff in the library	81	47.4	4

coordinators, webmasters, database consultants, metadata specialists, digital literacy managers, information literacy coach, corporate information officers, knowledge managers, etc.

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