

ATTITUDES OF ACADEMIC AND RESEARCH LIBRARY
PROFESSIONALS TOWARDS INFORMATION TECHNOLOGY
AND ITS RELATIONSHIP WITH LIBRARY AND INFORMATION
SCIENCE COURSES IN INDIA



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SHILLONG

Thesis
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October, 2002

I, T.Temjen, hereby declare that the subject matter of this thesis is the record of work done by me, that the contents of this thesis did not form basis of the award of any previous degree to me or to the best of my knowledge to any body else, and that the thesis has not been submitted by me for any research degree in any other University/Institute.

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CHAPTER – 1

INTRODUCTION

1.0 INTRODUCTION

How chapter heading and section heading can be name ?

Man, as a social being, has been known for his intense desire and inclinations towards communicating with his fellow beings to share his ideas, experiences, feelings, beliefs, ethos and pathos through different ways and means since time immemorial. Communication, as one among the most underlying characteristics of human beings, has been known to exist since the dawn of human civilization. The process of communication, including all its manifestations, has evolved from the crudest guttural grunts of man's primitive ancestors to the highly refined and versatile languages spoken today. In fact, it was man's innate urge to record his experiences and speculations for posterity that has led to the countless ingenious methods of recording, preserving and communicating his ideas and knowledge. From the ancient papyrus and cave paintings to the modern printed and digital forms, the modes of recording, preservation and communication have undergone spectacular transition.

Today, we are living in an information-intensive society. In other words, information has occupied a prominent place as a basic constituent in the growth and progress of the present-day society. Information, in fact, as a basic resource is now capable of determining and improving the quality of human life. This can be attributed to the advancements in the field of information and communication technologies, which have facilitated and accelerated the processes of generation,

acquisition, organization, storage, retrieval and dissemination of information from one corner to another cutting across the cultural, political and geographical boundaries. This transition of mankind's progress from the agricultural and industrial to the present-day information-driven age has been rightly called as the 'information era.' However, the basic problem today is that of the rampant growth of information and its availability in diverse formats and media. Managing information under such a situation, therefore, has become very difficult and almost impossible without the application of relevant technologies. It is in this context, that the criticality for the libraries to imbibe the technological changes and their relevant applications has become pertinent and inevitable to ensure effective and efficient services.

A library today as a service organization, aims at providing access to its information resources to the users --- an intermediary between the information and the users. The most vital question here is satisfaction of the users. While the bulk of information is increasingly available in varied forms and media, satisfying and fulfilling the information needs and requirements of the users has become the core problem for the libraries today. This has left the libraries and library professionals without any better choice but to imbibe the technological changes and developments.

The role and responsibility of a library today cannot be confined within its four walls and ever remain traditional in its approach. In this connection, it is worth considering the following problems that have become prominent and have thrown immense challenges before the libraries in today's scenario:

- (i) One most prominent problem for the libraries today is the overwhelming growth of information and its availability in diverse formats and media transcending the time and other barriers including the cultural and geographical barriers across the globe. To survive through these developments, libraries can no longer afford to remain silent spectators.
- (ii) The fast advancements in the field of information and communication technologies have brought the libraries to a very vulnerable situation. The emergence of the satellite-based information communication and networking systems, the computers and the various relevant application software packages and the multimedia technologies are some of the major technological revolutions that modern libraries and library professionals need to keep themselves current with.
- (iii) The multidimensional and the ever-changing information needs and requirements of the users have become the major concern of today's libraries. This has been mainly resulted from the ever-increasing competition in all human endeavours and the emergence of the inter-disciplinary and the cross-disciplinary approaches in research and development activities.

- (iv) The dominance of information and knowledge as the key resource in any human endeavour of the present-day society has made today's libraries and library professionals more vulnerable to the technological revolutions.

1.1 DEFINITION OF INFORMATION TECHNOLOGY

Information Technology (IT) is the product of fusion of information science and technology. Information science comprises of set of practices and related disciplinary studies, which is concerned with the transmission, organization, storage, retrieval and use of information. Technology is the branch of knowledge that deals with industry, applied science, engineering and so on. To define information technology is not a very comfortable assignment as the word is often been used in a pervasive manner. However, some of the prominent definitions on information technology have been given as below:

or
information
or
computer
technology
&
communication
technology
(or information technology)

The British Advisory Council of Applied Research and Development (1980) has broadly defined information technology as *“scientific, technological and engineering discipline and the management techniques used in information handling and processing, their application, computers and their interaction with men and machines and associated social economical and cultural matters”*.

In another definition of information technology, the American Library Association (1983) had stated that it is *“the application of computer and other technology to the acquisition, organization, storage, retrieval, and dissemination of information”*.

Information technology, defined by Carter (1985), is *“the systems and devices used for receiving, storing, ^{analysis} analysis and communicating information in all its forms and their application to all aspects of our lives, including the office, the factory and the home”*.

Forester (1986) had defined information technology as *“the new science of collecting, storing, processing and transmitting information”*.

In the words of Webster and Robins (1986), information technology is *“a range of goods and services emerging out of the integration and convergence of computers and communications that are shifting away from disparate products towards systems”*.

In Burton’s (1992) words, information technology is the *“Convergence of computers and telecommunications, handling information within obvious areas of applications such as management and administration, government, education etc”*.

In view of the above definitions, it may be concluded that information technology is the application of the concepts and techniques from various fields of studies including scientific, technological, engineering and management in handling information --- acquisition, organization, storage, retrieval and dissemination of information that encompass all spheres of human activity. It is also a convergence of computer and telecommunication technologies. Along this line, in the present study, information technology, therefore, is being defined as *“the application of computer technology and telecommunication technology for the purpose of acquisition, organization, storage, retrieval and dissemination of information towards providing effective and efficient information services.”* Further, the following components of information technology have been identified in the context of managing the libraries:

- (i) Automation ^{for} acquisition, serials controlling, online public access cataloguing, circulation and reference.
- (ii) Telecommunications for networking.
- (iii) Electronic mail, electronic bulletin and electronic conferencing.
- (iv) Online searching.
- (v) Compact Disc Read Only Memories (CD-ROMs).
- (vi) Telefacsimile (FAX).
- (vii) Personal computer applications.

1.2 NEED AND ADVANTAGES OF INFORMATION TECHNOLOGY

Information technology has played a prominent role in bringing about changes and improvements in libraries. With the advent of information technology and its applications to libraries, many strenuous and repetitive activities in the libraries, which were handled manually, have been replaced by machine-oriented processes. Card catalogues are closing in favor of machine formats. Many of the bibliographic and processing procedures of the past are now automated. Library services have become more effective and efficient and the users are satisfied in many ways. In this context, Crowe et al. (1988) have observed that information technology has created an entirely new working environment --- an environment where manual library routines of handling, storing and disseminating information have become more speedy, and more efficient, all because of the use of information technology. In fact, the whole library environment has gone through a sea of changes, a process that will be continuous and improved upon as time goes by.

Lancaster and Sandore (1997) have summarized the possible reasons as to why do libraries need to apply information technology as follows:

- (i) To cope with the increasing demands of the users.
- (ii) To reduce or prevent staff increase.
- (iii) To allow more activities to be performed by clerical and para-professional staff.
- (iv) To improve existing services.

- (v) To provide new services.
- (vi) To collect better data to aid overall management of the library.

Similarly, Cochrane (1992) had also pointed out that application of information technology to libraries could cultivate manifold advantages such as:

- (i) Facilitating easy integration of various library activities;
- (ii) Facilitating co-operation and the formation of library networks;
- (iii) Helps to avoid duplication of efforts within a library and between libraries in a network;
- (iv) Eliminating some uninteresting and repetitive work;
- (v) Enhancing the range of services offered;
- (vi) Providing marketing opportunities of its services;
- (vii) Ultimately may save and/or generate money;
- (viii) It increases efficiency

In the context of libraries in India, Babu and Parameswaran (1999) have also elaborated the advantages of using information technology in libraries; some of the prominent among them are given as below:

- (i) Application of information technology improves the quality of the library and information services (LIS);
- (ii) It also improves the efficiency of the library;

- (iii) Application of information technology enhances the knowledge and expertise;
- (iv) It is also essential to improve the communication facility;
- (v) Application of information technology is helpful to obtain the right information at the right time in the right place and at the right cost;
- (vi) Application of information technology also improves the status of the library and information center;
- (vii) Use of information technology reduces the work load of the library professionals;
- (viii) Application of information technology takes over the traditional way of information handling in the libraries and information centers;

Henderson (1992), while stressing on the need for libraries to go for relevant applications of information technology, had pointed following possible advantages of using information technology for the library users:

- (i) Provides speedy and easy access to information;
- (ii) Provides remote access to users;
- (iii) Provides round-the-clock access to users;
- (iv) Provides access to unlimited information from different sources;
- (v) Provides more up-to-date information;

- (vi) Provides information flexibly to be used by any individual according to his or her requirements;
- (vii) Facilitates the reformatting and combining of data from different sources.

1.3 APPREHENSIONS TOWARDS INFORMATION TECHNOLOGY

The application of information technology has manifold advantages, both to library professionals as well as the end-users. In spite of all these advantages, there are fears and apprehensions among library professionals. For some, the new technology represents a loss of control over their lives and their jobs. Health problems arising out of computer related works are being speculated with confusing conclusions. In this connection, Lancaster (1991, 1993) has suggested that many librarians may lose their service ideals because they have become mesmerized by the glamour of technology, seeing the technology as an end in itself rather than a means of improving range, scope, and quality of services.

Bergen (1988), in this regard, had discussed comprehensively about the fear of technology that prevailed among the library professionals. According to him, people fear the technology itself, cost of error, ability to learn, job security, reduced socialization, big brother phenomenon and health effects are the very prominent. In the first case, the fear is of the technology itself and its possible effects, such as the fear that books will be replaced by the digital medium. The second case of fear is that of making a mistake that

will damage the equipment, delete a file, which may prove to be costly to the organization. The inability to learn and use a new system is third type of fear. This is true especially in the case of older employees. Some employees fear that their jobs are being threatened and will be replaced by highly trained and qualified professionals. At the same time, redeployment of staff, changing responsibilities and the loss of traditional skills are being speculated with alarming results. Other fear relates to reduced socialization. They fear that if tied to a terminal for a large part of the day, one will have less contact with other staff members or with the public. Another case of fear is the big brother phenomenon – is the computer spying on me, is someone studying my profile while I am logged into the Internet, etc. Finally, there exist possible health hazards such as backache and eyestrain.

We may argue here that the jobs will not disappear entirely when information technology is introduced; only the nature of job will change. Routine work will be handled with the help of computers giving way to the professionals to take on other responsibilities. Therefore, the roles of library professionals may become more complex and demanding as jobs become simpler creating an entirely new situation. Thus, a situation arises where many library professionals may have learnt to handle new technologies in recent years, but only a few of them possess the profound technical knowledge required for introducing information technology developing information technology-based services in the library settings.

Success in any change process in the libraries will depend on the positive attitudes and participation of the personnel involved therein. It is, therefore, very important to understand and give the due consideration on the implications of the human factors involved in the process if libraries are to successfully and meaningfully introduce information technology and its applications. Thus, the concept of attitude, with emphasis on the context of the present study has been discussed in brief in the following subsections.

1.4 DEFINITION OF ATTITUDE

Through out the history of technological innovations, human beings have been found to be the most important factor governing the impact of technology on its surroundings. Be it in the field of science, medicine, social or behavioral science research, the human factor has played the most important role in deciding the outcome of any situation. Behavioral scientists have given high importance to the study of human beings and its surroundings in the context of attitude. By attitude, we mean an individual's tendency to react towards a certain object. Numerous behavioral scientists and researchers have defined attitude in their own contexts though all having similar concepts and ideas. The individuals' positive attitudes towards any change or technology contribute to the better performance. It is, therefore, particularly in the context of the present study, some of the prominent definitions on attitude are given as below in order to get a deeper understanding on the concept of attitude:

Thurston and Chave (1948) had defined attitude as *“the sum total of a man’s inclinations and feelings, prejudices or bias, preconceived notions, ideas, fears, threats and convictions about any specific topic.”*

In another definition, Allport (1950) had considered attitude as *“a certain disposition or preparedness to attempt certain objects or parts thereof rather than to others.”*

In the words of Katz and Scotland (1959), attitude is *“an individual’s tendency or predisposition to evaluate and object or a symbol of that object in a certain way... having affective, cognitive and behavioral components, i.e. as involving feelings and emotions, beliefs and actions.”*

Mac Donald (1965) had defined attitude as *“a predisposition to act in a positive or negative way towards persons, objects, ideas and events.”*

In this present study, attitude has been defined as *‘a certain predisposition to act or react in a positive or negative way towards certain situations and ideas. Reactions can be preconceived notions, ideas, fears, convictions, etc’.*

1.5 LIBRARY AND INFORMATION SCIENCE COURSES AND APPLICATIONS OF INFORMATION TECHNOLOGY

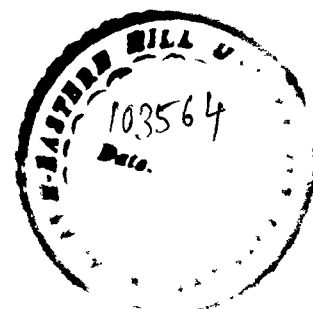
In the recent past, the advancements in information technology have been able to bring a lot of changes and new developments in library and information science education. In other words, the impact of information technology has been felt tremendously on this professional education system. Today, there is a near consensus that library and information science education needs to cope up with the developments in information technology. Changes and developments are apparent in the curriculum that had begun to include courses on Library Automation, Computer Technology, Information Technology, etc. The thrust area behind these trends is to adapt and equip the professionals with knowledge on relevant applications of information technology while making them computer literate. However, in spite of all these changes, there has been much hue and cry about the falling standards of library and information science education in India.

Library and Information Science Departments of various universities in India have been revising their syllabus¹² in accordance with the present requirements. They have been either unable or partially successful in providing the basic requirements because of financial constraints in acquiring computers, CD ROMs, Internet facilities and other infrastructural requirements. Even though information technology related topics are being

taught across the country, it has been a very difficult task to ascertain as to what extent the topics are being dealt with.

Agarwal (1996) had pointed out that “they do not reflect either the changes brought about by the modern technology and the latest researches or the changing needs of the users in general and the specialized groups in particular.” Moreover, there have been no empirical studies to show how effective the current Library and Information Science education is and what should be the content of Library and Information Science education.

Similarly, Das (1997) stressed on the need for full-length discussion in order to bridge the gap between information technology frontiers and library academia. The present ^{or curriculum?} curricula was found to be inadequate, it tended to be theoretical in nature which, by and large, do not groom the students to acquire practical on-the-job experience to cope up the upcoming sophistication and socio-economic impacts. Srivastava (1997) also had recommended that library and information science courses must expose students and practicing professionals to various components of information technology, keeping in mind that these must supplement and complement the curriculum of library science and instruction patterns.



Konnur (1997) had also pointed out that even though the fundamentals of computers, computer use in libraries are being taught, what is required is inclusion of more topics such as networks, database, management systems, CD-ROM technology, multimedia, internet etc. In similar veins, Naidu (1997) had also pointed out that “many departments in the country have introduced a paper on ‘computer application’ either at the Bachelors level or at the Masters level or both. In most of the departments this experiment has been found to be a theoretical gamble, because many of them are yet to acquire a personal computer.”

In the words of Saxena et al. (1998), “Our library science school has failed to produce the desired type of library and information science professionals.” They have further elaborated the reasons for this dissatisfaction as follows:

- (i) Outdated syllabus.
- (ii) No uniformity in syllabus.
- (iii) Lack of teaching staff.
- (iv) Absence of statutory agency to formulate and enforce norm of standards.
- (v) Lack of infrastructural facility for teaching information technology.
- (vi) Saturation in the profession.
- (vii) Reluctance of teachers to join refresher courses.

The Directory of Library and Information Science Education in India had reproduced the course of studies of almost all the library schools in various universities and had revealed that the course contents of a large number of them hardly comes up to a modern standard.

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In view of the fast changes and developments in technologies, particularly information technology, telecommunication technology and computer technology and also the increasing demands of the users, the library and information science education system in India is still far from satisfaction. It is, therefore, imperative on the part of the schools offering library and information science courses, to give the due emphasis on equipping the professionals with adequate skills and knowledge to cope up with the situations in today's technology-based environment.

1.6 INFORMATION SCIENCE COURSES OFFERED IN THREE UNIVERSITIES OF NORTH EAST INDIA

There are three universities in North East India, which offer courses in Library and Information Science. Gauhati University offers M.Lib.Sc. and Ph.D. programmes. North Eastern Hill University offers the same and Manipur University offers B.Lib.Sc. and Ph.D. programmes. The syllabus from all the three institutions were collected and compared to show the extent of Information Science and Information Technology related Courses being offered in these each institutions, as shown in Table 1.1 below.

Table 1.1: Institutions and information science courses offered

Sl.No.	Name of Information Science Courses	Gauhati University (GU)	Manipur University (MU)	North Eastern Hill University (NEHU)
		M.Lib.Sc.	B. Lib.Sc.	M.Lib.Sc.
1	Introduction to Information Technology	Offered	Not offered	Offered
2	Programming	Offered	Not offered	Offered
3	System Analysis	Offered	Nor offered	Offered
4	Computer Application in libraries	Not offered	Not offered	Offered
5	Information storage and retrieval	Not offered	Not offered	Offered
6	Indexing/abstracting	Not offered	Not offered	Offered

It is evident from the above table that Manipur University, offering only B.Lib.Sc. and Ph. D programmes does not offer any information technology related courses or information science courses, while Gauhati University offers some information technology related courses. Further, it is observed that North Eastern Hill University offers a better course structure with regard to information technology and information science courses are concerned. However, the researcher could not ascertain the depth and the practical aspects of the courses that are being offered and taught as this tabulation is purely based on the syllabi of the three universities.

1.7 CONCLUSION

In this day and age of rapid changes and developments, particularly in the field of information and communication technologies, the interrelationships between technologies and the people involved become more complex. Literature in this line has shown that

only a few studies have been made on the library professionals and their attitudes towards technology. Libraries today are trying to cope up with the changes brought in by the technological advances and yet they are still unable to succeed. One major impediment in this regard, is the negative attitudes of the library professionals towards technology. On the other hand, an interesting trend in Library and Information Science Education and Research is the increasing attention given to the relationship between technology and the people involved. Library and Information Science Departments in India have been revising the course outlines by adding relevant technology related courses into the structure basically to prepare the students for libraries of this new age of technology. However, the fundamental question still remains as to 'how effective has this practice been in preparing the up-coming library professionals to handle the challenges of this technological invasion while fostering in them the much needed positive attitudes towards technology'.

CHAPTER – 2

REVIEW OF RELATED LITERATURE

2.0 INTRODUCTION

Today's organizations are faced with a bulk of challenges due to inevitable changes brought about by the technological advances in particular. There is, however, a mounting need for the organisations to adapt to these changes, on one hand, while on the other, management is left with an enormous task of managing these changes, in which, making the people at work to accept the changes remains the most fundamental concern. In short, integrating and coordinating the human and technological components have become the most vital issue in today's world of management, where the libraries are not exempted. In fact, libraries and library professionals have become increasingly susceptible to this technological invasion. It is, therefore, ^{at} this juncture that the criticality of giving the deserving consideration and assessment on the human factors have become very pertinent for the success of any change or changes that an organisation had to imbibe. In other words, understanding and preparing the mind-set of the people involved in any change process is very crucial to develop positive attitudes towards any change --- an indispensable factor for the successful introduction of any change or new technology into the organisation.

During the early phase of the technological revolution, much attention was given only towards new developments and their applications to solving problems. The human factors had been largely ignored with only a very little scientific ^{investigation on} approach given particularly on the human attitudes towards the technologies. However, the studies on

human attitudes towards the technologies have gradually emerged as a direct result of the technological failure in successfully adapting to real situations, not because of the technical problems, but because of the human-technology interaction problems. Davis et al. (1989), in this regard, had rightly pointed out that *“understanding why people accept or reject computers has proven to be one of the most challenging issues in information systems research.”* Most of the research on human attitudes towards technology emerged in the late 1970s and the early 1980s, and the literatures in this line are still scarce in number, particularly pertaining to Library and Information Science. In this chapter, an attempt has been made to review the literature spreading chronologically over two decades and have been discussed under the following areas:

- (i) Attitudes towards information technology in other fields.
- (ii) Attitudes of Library Professionals towards computers /automation,
- (iii) Attitudes of Library Professionals towards information technology.

2.1 STUDIES ON ATTITUDES TOWARDS INFORMATION TECHNOLOGY IN OTHER FIELDS

In a significant study, an attempt had been made to investigate the experience of computerization across occupational groups by Zoltan and Chapanis (1982) with a population sample drawn from four professional groups, viz., Certified Public Accountants (CPAs), Lawyers, Pharmacists and Physicians ^{hailers} hailed from (the) Baltimore city, U.S.A. The attitudes towards computers were measured through paired adjectives

assembled in a semantic differential format, and Likert-type statements. In this study the respondents were primarily male. The study had revealed that:

- (i) CPAs were more likely to have formal computer training courses. Lawyers were least likely to have access to computers.
- (ii) Professionals held both positive and negative attitudes towards computers. They viewed computers as beneficial. They also perceived them as depersonalising, difficult and complex.
- (iii) CPAs and Pharmacists had positive attitudes towards computers

In another related study, Arndt et al (1983) had carried out a survey of 408 secretaries employed at a Mid-Western University to assess their attitudes towards computers. The survey was conducted by investigating the affective feelings of the respondents such as anxiety and attitudes towards one kind of computer equipment they may encounter in their job - a word processor.

With a response rate of 59 percent, the study had come up with the following results:

- (i) It was found that previous experience with word processors and frequency of use were related significantly to anxiety level.
- (ii) Locus of control and complexity, two variables included the study were found to have association with the attitudes towards processing.

- (iii) Secretaries with more external locus of control were found more reluctant to use the equipment while individuals with more complex personality showed more eagerness and curiosity to use the equipment

Kerber (1983), in his study, had attempted to assess the attitudes towards specific computer applications among 203 undergraduates in a Liberal Arts College. Personal data such as gender, subject major, computer experience, computer courses taken, job experience with computers and the nature of computer experience were collected. He had used the instrument that Zoltan and Chapanis had developed to measure beliefs about and attitudes towards computers.

The findings of the study were as follows:

- (i) Students from natural science majors were more likely to have had computer experience than those students from humanities or social science majors.
- (ii) Factor analysis showed that respondents perceived computers to be quite efficient, slightly dehumanising, slightly enjoyable and neutral in difficulty.
- (iii) The respondents were quite favourable towards quantitative applications, somewhat favourable towards record keeping applications and somewhat unfavourable towards decision-making applications.
- (iv) Computer experience was significantly related to favourable attitude towards computers both for quantitative and decision-making applications.

In yet another attempt, Arndt et al (1985) had undertaken a survey to study the students' attitudes towards computers using the questionnaire and semantic differential items developed by Zoltan and Chapanis. All together, there were 737 respondents out of a total of 1500 students taken from a large Mid-Western University.

The result of the study indicated that no significant correlation between gender and attitudes towards computers existed. However, it was found that the individuals with computer experience and those who viewed computer knowledge as essential for getting a job in the future tended to show a positive attitude towards computers.

Koohang and Byrd (1986) had carried out a study to probe into the effects of age, gender, college status and computer experience on attitudes towards computers among students using the Library Computer System (LCS) in the Morris Library at the Southern Illinois University, Carbondale. The investigators measured the attitudes using three subscales, viz., computer anxiety, computer confidence and computer liking.

The results showed that age, gender and college status did not make a significant difference throughout the subscales. However, it was found that computer experience had significant relation with computer anxiety and computer liking, while it did not affect significantly on computer confidence.

Using Oetting's attitudes towards computers scale, Gilroy and Desai (1986) had carried out two studies to investigate the relationship between computer anxiety and some demographic variables--- gender, race and age of the students drawn from two colleges in Maryland. In the first study, they administered the test and gathered information on gender, race, age, experience with computer, and formal courses in computers.

It was found that gender, formal courses in computers and computer experience were found to have significant relation to computer anxiety. However, when examining the factors and their interactions, it was found that computer experience alone was not enough to reduce computer anxiety for white students and males. The reduction was significant only when computer experience was combined with formal courses in computer. On the other hand, for black students and females, experience alone was not enough in reducing computer anxiety.

Assuming that applications~~s~~ oriented computer courses help~~s~~ in reducing computer anxiety, they conducted a second study with both black male and female students. A quasi-experimental design was used with word processing and computer science courses as two treatments administered to two separate groups.

The result showed that the difference in anxiety scores of the controlled group was significantly less than the other group with treatments. Regarding gender, difference was

observed in their scores between males and females in the word processing treatment, in which, greater change was demonstrated in the females.

In their study, Massy and Engelbrecht (1987) questioned how the basic computer related skills were associated with individual's attitudes towards computers. In this connection, they studied the relationship between typing and word processing skills and perceptual orientation regarding conceptual understanding and application of computers among college students.

The result of the study indicated that typing alone did not lead to specific task understanding. However, it was found that the typists were significantly more likely to understand future office computer uses than the non-typists. This study supported the findings of the previous studies that showed the positive relationship between the familiarity with equipments or systems and the attitude towards computers.

Durndell and Siann (1987) conducted a survey of 928 students at an institution of higher education in Scotland to investigate the relationship between the use of computers and their background including the discipline being studied, attitude towards computers and information technology, attitude towards technology in general, computer experience and gender.

It was revealed that:

- (i) The students had fairly positive attitude towards computer and Information Technology.
- (ii) Though the difference was insignificant, the students in computer and electronics and in those fields in which a high degree of technology was used showed more positive attitude. The students in these areas were more knowledgeable about and had more computer experience than other groups. This had indicated that a positive correlation between attitudes towards computing and computer experience.
- (iii) Females were found to be less interested in computing when compared to males across all groups including computer and electronics field.

An Information Technology Attitude Inventory to investigate intercultural differences or cross cultural consistency in information technology was developed by Leutner and Wensier (1994) while conducting the study at 3 universities in Germany, Belgium and the U.S. For the purpose of their study, data on 529 students was collected.

The result of the study had revealed a high similarity in the interim correlation structures across the sample population. This consistency underlined the validity of the questionnaire design. This had a strong preference for non-computer as opposed to computer sources and U.S. students showed no preference. The result suggested that the

object loses its controversial feature, as it becomes more a component of a normal environment.

A similar study was conducted by Peters (1990) to assess the attitudes of the staffs towards computers at all field units of Greater Vancouver Mental Health Services.

Positive attitudes were found with notable variations across different professionals. Psychologists' attitudes were discovered to be least positive, while Social Workers held more intermediate views. The most positive attitudes towards computers were those of nursing, clerical and other administrative, rehabilitation and support staff. The attitudes of younger staff were more positive than those of older staff of 50 years of age. Staffs of higher level with previous computer experience were positive towards Information Technology.

Jacobson (1991) had studied the sex difference in library anxiety, computer anxiety and using computers for library search anxiety among 40 academically oriented high school seniors during the course of a year-long intensive library research experience.

A significantly higher library anxiety, higher computer anxiety and using computers for library search anxiety ^{were} found among the girls. Both sexes improved significantly through time in all three areas except for girls who had library search anxiety while using library computers.

Another study was conducted by Monaghan (1993) on the Information Technology (information technology) background of 47 secondary mathematics Post-Graduate-Certificate of Education (PGCE) students and their use of information technology in their mathematics lessons in schools. Examination was carried out on the traditional and school based initial training schemes.

It was found that there were slight differences in the use of information technology in mathematics lessons. Students' use of Information Technology was influenced by their previous exposure to various types of software and their attitude towards information technology.

2.2 ATTITUDES OF LIBRARY PROFESSIONALS TOWARDS COMPUTERS/AUTOMATION

Luquire (1983) had carried out a study on Librarians' attitudes towards automation/innovation in academic libraries, the OCLC system. The population included those coming under Association of Research Libraries (ARL), of which, 23 out of 25 had participated. He identified five factors that might affect the Librarians' attitudes in evaluating an innovative system. They include:

- (i) The style of decision making in the library.
- (ii) The rank of the librarian in the hierarchy.
- (iii) The organization and size of the library.

- (iv) Planning and preparation for the new system.
- (v) Selected demographic factors affecting staff perceptions.

In all, a total of 269 respondents working in technical services areas responded the questionnaire.

The findings of the study showed that:

- (i) The more participation in the library decision making by respondents, the more positive was the evaluation of the innovation.
- (ii) The greater familiarity with the new system, the more positive were the respondents' attitudes.
- (iii) The rank or job level of the Librarian in the hierarchy was an important variable in the attitude towards the introduction of OCLC.
- (iv) A negative relationship existed between the size of the library by volume count and the respondents' attitude towards OCLC.
- (v) No significant relationship existed between age and attitudes towards the technological innovation.
- (vi) The more recent the Librarians' training in librarianship, the more positive was his/her attitudes towards the new system.
- (vii) There were no clear relationship found between the amount of computer experience or training and the overall attitudes towards OCLC, however, there

was a significant relationship between the number of additional graduate degree held and the amount of computer training or experience reported.

In relation to management style, Olsgaard (1984) had examined the relationship between academic library professionals' attitudes towards computer-based systems and the level of participatory management used (as observed by the responding librarians) by their immediate supervisors. He used two kinds of sample for his study--- one stratified random sample selected from Association of College and Research Libraries (ACRL) personal members, and the other 100 % sample of professional staff from 13 academic libraries of varying size in the Midwest. On the average, the librarians surveyed were women between the ages of 30 and 50 and had a master's degree in Library Science, had approximately 15 years of work experience in libraries with 10 years of experience at their current libraries, were working in the libraries that had computer-based systems for at least eight years, and personally exposed to these systems in a moderate degree.

His findings showed that:

- (i) The respondents had showed overall favourable attitudes towards the computer-based systems.
- (ii) The respondents considered that these systems had more potential in aiding clerical operations rather than in aiding managerial functions of the libraries.

- (iii) A statistically significant non-linear relationship between the level of participatory management style and the attitudes of the librarians towards computer-based systems was observed.

Bothwell and Lovejoy (1987), dealing with academic libraries in Australia, reported that while some employees felt their jobs had become more interesting as a result of automation, the majority reported that there were no change or even a decline in interest. However, the 75 staff members surveyed in three university libraries were more in agreement that automation had increased efficiency.

Similarly, Sievert et al (1988) had carried out a study to investigate computer anxiety among library staff in academic library and its effect on level of participation in a library computer literacy program, and attitudes towards library automation and computers in general. Attendance records from 16 computer literacy workshops were analyzed to identify three groups of subjects: non-participants, low participants and high participants. All together, 63 subjects were administered a questionnaire developed by Maurer and Simonson for measuring computer opinion survey which was followed up by interviews. SAS program and analysis of variance (ANOVA) were used for analysis.

The findings of the study were:

- (i) There were no significant differences found across the groups on non-participants, low participants and high participants.

- (ii) Demographic variables --- age, gender and education were shown to have a relationship with computer anxiety.
- (iii) Two of the environmental variables, i.e., position classification and work in other libraries did not show a significant relationship with computer anxiety.
- (iv) Access to a computer other than at work and exposure to OCLC did not show a significant relationship with computer anxiety.
- (v) Department and number of years worked in the libraries were shown to have a significant effect on computer anxiety.
- (vi) Computer experience was significant in determining computer anxiety.

The study of Yoo (1988) was an effort to explore academic Librarians' attitudes towards computer technology and their relationship to Library Science Education. Questionnaires were served to academic libraries in the US who had ALA-accredited Library Science Programs. A total of 48 libraries were selected for the study. The data was analyzed using SPSS and statistical methods such as T-Test, Pearson's Coefficient of Correlation and Factor Analysis.

It was found that the librarians surveyed showed positive attitudes towards computers. However, among the librarians in different academic disciplines, there existed differences. As for instance, librarians with professional field backgrounds showed more positive attitudes towards computer than those with social sciences background. On the

other hand, no significant relationship was found between the attitude and the amount of computer experience measured either in terms of number of years the librarian had been working with computers on the job or the length of time elapsed since a computer had been introduced in their work environment.

In another study, Lee (1989) had carried out a survey to assess the effect of knowledge and attitudes of Library Directors and Professional Librarians towards library automation on Automated Programs in Academic and Research Libraries in Taiwan and the Republic of China. Three types of questionnaires were designed and administered to 97 Library Directors and Associate Directors and 430 Librarians in 91 Academic and Research Libraries. The data on the extent of automation were subjected to analysis of variance (ANOVA), multiple regression procedures and Pearson's coefficient of correlation.

The result of the study were as follows:

- (i) The overall attitudes of the Library Directors, Associate Directors and the Librarians were found to be favourable towards library automation. Although their knowledge and background of library automation was limited, they had realized that library automation was a trend, a must and had fully supported it.
- (ii) However, there existed a significant relationship among level of education, knowledge of computers, systems analysis, reading books/articles on

computers or library automation, work experience in library automation and attitudes towards library automation.

- (iii) It was also found that the size of the library holding and the control of the institution were not related directly to the extent or degree of automation.
- (iv) Directors and Librarians' attitudes had no effect on the development of automated library programs.

Another similar study was carried out by Totten (1993) to understand the librarians' attitudes towards computers, desktop publishing systems and expert systems. All together, 52 academic and 62 public librarians were chosen for the study using questionnaire method. A Q-sort was used to measure differences in academic and public librarian attitudes towards computers, desktop publishing systems and expert systems. The responses were sorted into groups based on the types of library and whether or not the respondent followed the stated Q-sort distribution. Statistical analysis including one-way analysis of variance (ANOVA) and turkey-B tests were applied.

The result of the study indicated that there were no significant differences between the means for attitude towards expert system and the means for attitude towards desktop publishing systems. These attitudes in turn were both statistically different from the means for attitude towards computers. When groups were compared on attitudes towards the three variables, the only statistically significant difference was between non-

distributional academic librarians and distributional public librarians on the desktop publishing variable.

In another significant study, Su (1993) had made an attempt to assess the attitudes of academic library professionals towards computer-based systems in Taiwan. The study was conducted using questionnaire method and followed up by telephone interviews. The questionnaire was based on three general concepts:

- (i) Computer-related attitudes/perception.
- (ii) People-related attitudes/perception.
- (iii) Services/work-related attitude/perception.

Out of 76 questionnaires distributed, only 60 (79%) were received from 10 university libraries. The respondents were asked to use a Likert-type scale to respond to positively or negatively worded statements. Out of the 60 respondents, 51 had a bachelors degree in Library and Information Science and only 6.8% had masters degree. More than half of the respondents, i.e., 34 fall in the 30-39 year old bracket, and 16 in the 20 – 29 years old bracket. 10 were over 40 years of age.

Findings of the study were as follows:

- (i) The overall response in the study revealed that the attitudes of library professionals towards computer-based library systems in Taiwan were found to ^h

be favourable, though there existed differences in their perceptions to a certain extent.

- (ii) The result of the 'student T' test showed that supervisory librarians were significantly more optimistic than the non-supervisory on certain aspects--- accuracy of computer-generated information; simplicity of computer-based systems, adequacy of training related to the computer-based systems and librarian influence on system development.
- (iii) No significant relationship between years of library experience and attitudes towards computer-based systems was found, except that the more experienced professionals were significantly less enthusiastic about integrated multimedia systems.

In view of the above findings, she had suggested that the non-supervisory professionals in academic libraries in Taiwan should be given continuing education programmes related to the potentials of technologies to strengthen and develop positive attitudes of the professionals towards library automation.

Bii and Wanyama (2001) had undertaken a study relating to the impact of automation on job satisfaction of the library professionals and para-professionals of Moi University, Kenya. The lowest and the highest professional qualifications they possessed

were certificate and masters degree in Library Science respectively. Questionnaire and interview methods were used.

The study came up with the following findings:

- (i) Majority of the respondents (80%) was found satisfied and positive about computers. This was mainly because they had been performing computerized tasks in their workplace. Most of the staff welcomed computerization because they believed that computers would increase their efficiency at work. They associated computers with advancement, prestige, increased information technology training, and a complete revolution of the work environment.
- (ii) Interestingly, a critical observation of the responses revealed that those who found computers difficult to use did not seem to gain a lot of satisfaction from the use of computers. A few of the staff viewed automation as a source of dissatisfaction, for which, they blamed the way automation was handled (the process of automation).
- (iii) An interesting observation on dissatisfaction among the lower level staff was boredom and monotony due to daily exposure to the same screen, instructions and procedures.
- (iv) Yet another interesting finding was that of the respondents' dissatisfaction over the lack of adequate information technology skills and over-inquisitive users with information technology related problems.

2.3 ATTITUDES OF LIBRARY PROFESSIONALS TOWARDS INFORMATION TECHNOLOGY

In a relevant study undertaken by Fine (1979), an attempt was made to investigate the resistance to technology in public library settings and to identify the psychological, environment, and demographic factors that effect the resistance using questionnaire and interview methods.

The findings of the study were:

- (i) It was found that the most significant factors responsible for negative attitude towards the technology were that technology will result in loss of control and privacy, will erode interpersonal relationships, will replace people in their job, and will replace familiar, traditional and valuable library processes.
- (ii) Relating to demographic factors, she had found that females, older people, individuals who had no longer working experience in libraries, and individuals whose background were in the humanities were more likely to resist the technological innovations.
- (iii) It was also found that those who were working with automated systems on the job were less resistant to technology.
- (iv) Unlike Luquire, no significant relationship was found between the resistance and the size of library, and the type of community served.
- (v) With regard to sociological factors such as political leaning, self-reported life style, and religion were found not related to the resistance to technology.

- (vi) From the survey of library administrators, it was found that 14% of them considered their staff attitudes as resistant to technology while 28% considered their staffs somewhat reluctant. Administrators, in general showed openness to technological innovations.

Yaghmai (1981) had studied the attitudes of academic, public, and special librarians in western Pennsylvania towards networking. It was found that the individuals involved in networking opportunities showed more positive attitudes towards networking that coincided with Fine's finding of individuals who worked with computers in their work environment showed less resistance. However, no significant difference was found in terms of resistance to technology across the librarians of different types of libraries.

Prince and Burton (1988) were more positive with their result but showed that major differences might have existed from one library to another. While 45% of the staff in one British academic library reported that their jobs were more interesting, 50% reported no change in their attitude. In the second library, 33% reported that it was more interesting while 67% reported no change. In the last case, 23% reported a change in their attitude, 31% had reported that their work had become less interesting.

In another attempt, Waters (1988) had carried out a study among the four groups of professionals in Australian academic libraries to assess their attitudes towards information technology.

The findings of the study had revealed that:

- (i) The professionals had showed some agreement that automation has made library work more challenging and interesting when compared with the non-professionals. However, majority of the 64 respondents felt that the challenges of their jobs had remained more or less the same.
- (ii) The non-professionals had shown negative attitudes towards information technology by arguing that information technology had reduced creativity rather than increasing it.

DuMont and DuMont (1989) had conducted a study on the information professionals and the new technology as an attempt to investigate possible differential responses by gender. The sample population used in the study consisted of 105 members of the Ohio Library Association (OLA) who were identified on the basis of having association with an academic library. For collection of data, the investigators had applied a two-wave composite questionnaire containing 135 items that had generated 67.8% response. ANOVA, Pearson's coefficient of correlation and chi-square were applied for the data analysis.

The findings of the study were as follows:

- (i) It was found that there existed a strong relationship between the motivation to manage and attitudes towards technology.
- (ii) Interestingly, no significant relationship was established between the librarians in management position and those in the non-managerial position in so far as their attitudes towards technology is concerned.
- (iii) Also no significant difference was found between the male and the female librarians towards technology.

The above findings had suggested that attitudes towards technology might not be appropriately used to explain gender imbalance in so far as management positions in the libraries are concerned.

Jones (1989) conducted a study on library support staff perceptions and opinions on technology. Three academic libraries in the United States were identified for the study and the questionnaire was distributed to the support staff. A response of 50% were returned and analyzed. The overall results of the survey indicated an exceedingly positive attitude towards technology, even though there was a strong undercurrent of personal frustration and irritation. There was evidence of an intense desire to learn and to fit into the rapid flow of new technology.

In Yaacobs' (1991) study on librarians' attitude concerning information technology in government-supported special libraries in Malaysia, a total of 120 librarians in Malaysia were surveyed through the mailed questionnaires and interviews. Various statistical methods, including the chi-square test, Pearson's coefficient of correlation and multiple classification analysis were used.

The results showed a relationship between the librarians' attitudes toward information technology and the amount of technology available in government-supported special libraries. A relationship was also found between the librarians' attitudes toward cost and resource allocation and the amount of technology available. In the interviews it was found that while most librarians agree with the notion that information technology provides some of the most effective way for efficient services, budgetary constraints forced them to give priorities to other aspects of collection development. Attitudes towards education and training were not positively related to the amount of technology available in the libraries. No significant relationship between the librarians' attitudes toward the impact of information technology and the amount of technology was found. The six variables that had significant relationship with the librarians' attitudes were the size of the library, the library's budget, the size of the staff, the recency of attaining professional qualification, and the knowledge in information technology. The multiple classification analysis indicated that knowledge in technology, budget, size of the staff

and the size of the library are good predictors of the librarians' attitudes toward technology.

Hauptman and Anderson (1994) investigated the attitudes toward technological applications and implementation in various types of libraries and the challenges faced by staff and users. A total of 800 libraries i.e., 200 public, 200 school, 200 special, and 200 college and university libraries were randomly selected from the American Library Directory and questionnaires were mailed.

The survey revealed that surprisingly, technology was not as widespread as had been hypothesized. Overall, the library staff and the user perceived technology as extremely appreciative. Even though the respondents did not have access to all technologies in the library, they found technology fairly easy to use. They also felt that technologies were not being fully utilized and that more technologies would increase services. Library staffs were seen to be more appreciative and more fully utilizing the technologies available in the library. Almost half of the respondents felt that the training was inadequate and that they had inadequate budget for adding new technologies. The library staff felt that in addition to increasing the speed, accuracy and efficiency of providing information by using the new technologies, it also had upgraded their image among the patrons. Another aspect was that technologies had provided tremendous personal and professional growth.

Edwards et al. (1995) used questionnaire and interview methods to study attitudes of staff in six academic libraries in the United Kingdom. While many supporting staff felt that “electronic information” had reduced their workload, the majority of professional librarians disagreed, although all groups reported an increase in job satisfaction and they felt more effective in their work. The majority, professional librarians and support staff alike, found it difficult to keep up with new developments and were frustrated by their “lack of technical expertise.” There was a strong agreement that technology does not foster isolation – either from library users or other staff members – and that it may be unlikely to lead to loss of jobs. A somewhat surprising finding was that, while respondents were enthusiastic about working with electronic tools, they felt little confidence in them.

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Jones’ (1999), in her study on library support staff and their perceptions and opinions towards technology in their work place was a repetition of the study conducted on a population that was carried out ten years earlier (Jones 1988). Questionnaire method was used for the study on three academic libraries surveyed earlier in 1988. In all, 118 individuals out of 218 responded the questionnaire.

The findings of the study showed that there was an overall positive attitude towards learning and using the new technologies. Some negative reaction to technology and change seems to have more to do with increasing workload than with the changing

technology itself. A relationship was found to exist between the need for training in the new technologies and the time to absorb and practice after the training sessions. One aspect of negativity was that the 'need-to-learn-based' for new technology was too fast. It was also found that technology makes the work harder, more workload and increase responsibilities. There was a relation showing a decrease in satisfaction as staff involvement in decision-making decreases. Perhaps one of the most important findings of this study was the impact of technology on the health of the staff. There is a growing concern among the library employees about health problems, which may be directly linked with the concentrated use of computers or may be more loosely related to the stress of continued or intense technological change.

In another study conducted by Al-Zahrani (2000) on perceptions concerning information technology (IT) innovations and information technology training in university libraries in Saudi Arabia, a total of 147 library staff from four university libraries in Saudi Arabia were surveyed by using questionnaires distributed through mail and onsite visits. This was supplemented by interviews with the deans of library affairs in order to examine the decision-making processes. The findings of the study were obtained through T-Test and Analysis of Variance (ANOVA) using SPSS.

The findings showed a positive level of sophistication and understanding of information technology in Saudi university libraries. Information technology was

perceived to have relative advantages, compatibility, trial ability, and observability by the social system of the study. This had indicated that information technology would continue to be diffused rapidly in Saudi university libraries. More training on the use of available information technology is needed. The study also found that only 48% of the respondents who had used information technology in their work had attended information technology training program. A significant relationship was found between respondents' educational background, experience in using information technology, and their perception about information technology. Lack of written training policy and training on the latest information technology were the constrains that faced the information technology training.

2.4 CONCLUSION

The studies on any technology-based change or changes have emphasized in one way or the other, on the need for giving the deserving consideration and assessment towards the criticality of the human factors involved in the process. It has been found and agreed that positive attitudes of the personnel involved is very crucial for the meaningful success of any change process. Working experience with computer, participation in technology related training courses, recency of attaining professional qualification, provision of in-job information technology related continuing education and the amount of technology available in the library were found to have significant impact on the library professionals in generating positive attitudes toward information technology. Further,

participation and involvement of the people in the actual process have been found very essential for fostering positive attitudes towards information technology.

CHAPTER – 3
METHODOLOGY

3.0 INTRODUCTION

The modern library is a hybrid of information and technology. The amount of information available and the various means of accessing this information has put a lot of pressure on library professionals. Even though application of information technology in libraries has benefited both library professionals as well as users in providing better services, none the less it has put tremendous pressure on library professionals to learn and use information technology for a better solution. In this scenario, it becomes very important to understand the attitudes of library professionals towards information technology.

Attitude is not an immediate observable variable, but a latent one. Attitudes are not innate but are the results of the amount of direct experience an individual had had with the ^{object of attitude} attitude object. In addition, attitude reactions are evaluative and affective and give rise to motivation. Motives interact with the situation and determine the outer behaviour of an organism. An attitude does not refer to any specific response, but is an abstraction of a large number of responses of an individual. The attitudes are aroused by some drive state which is reflected in some goal orientation of the frustrated or satisfied individual (Satish, 1994).

3.1 OBJECTIVES OF THE STUDY

The objectives of the study are:

- (i) To measure the attitudes of library professionals towards information technology.
- (ii) To study the nature of relationship between attitudes towards information technology with socio-economic variables of library professionals.
- (iii) To understand the relationship between attitudes towards information technology and library and information science education.
- (iv) To examine the extent to which attitudes towards information technology is related to the use of information technology by library professionals.

3.2 HYPOTHESES

The basic assumptions are that library professionals' attitudes will differ significantly on the basis of socio-economic variables, i.e., age, sex, designation, professional qualifications, academic qualifications, working experience in the present library and overall working experience in libraries. Moreover, it is reasonable to assume that attitudes will be affected by experience with computers in the workplace and nature of exposure to computer in the workplace. Keeping in view the above assumptions, the hypotheses to be tested are as follows:

H₁. *Attitudes of library professionals towards information technology will differ on the basis of socio-economic variables. The socio-economic variables identified are age, sex, designation, professional qualifications, academic qualifications, working experience in the present library and overall working experience in libraries.*

H₂. *Library professionals with experience on computer will show positive attitudes towards information technology as compared to library professionals without experience on computer. The experience on computers is defined as working experience with computers and duration of installation of computers in the library.*

H₃. *There is no relationship between attitudes towards information technology and information science courses taken by library professionals.*

3.3 THE RESEARCH SITE

The research site is North East India, which consists of the following states:

- (i) Arunachal Pradesh
- (ii) Assam
- (iii) Manipur
- (iv) Meghalaya

- (v) Mizoram
- (vi) Nagaland
- (vii) Tripura

Initially, an exhaustive list of academic and research institutions in North East India was prepared. The list was prepared based on secondary sources like The Commonwealth Universities Yearbook (1996), Basic Statistics of North Eastern Region (2000) and research and academic institutions listed at the website of NICNET. A total of 43 libraries were finally identified (Annexure-I). A letter requesting the list of the total number of library professionals along with their designation was written to each institution which was accompanied by a self-addressed stamped envelope (Annexure-II). It was observed that some universities have many campuses. Each campus has independent library either run by Deputy Librarian or Assistant Librarian. For the purpose of this study, they have been categorized as independent libraries. Out of 43 libraries, 31 libraries replied to the request giving details about their libraries. It was observed that 8 libraries out of 31 libraries were very small with collection less than 5000 and being manned by one qualified professional. These 8 libraries were dropped from the sample and 22 libraries were finally selected for the purpose of the study. The list of libraries in North-East India is presented in Table-3.1.

Table -3.1. List of libraries in North-East India

Sl no.	Libraries	Campus	Designation					Total strength	Questionnaire received
			Librarian	Deputy librarian	Assistant librarian	Professional Assistant	Semi-professional Assistant		
1	North Eastern Hill University	Shillong	1	1	4	9	10	25	14
2	North Eastern Hill University	Tura	-	-	1	1	-	2	1
3	Nagaland University	Medzhephema	-	-	1	1	-	2	2
4	Nagaland University	Lumami	-	-	1	1	-	2	2
5	Tezpur University	Tezpur	1	-	2	1	1	5	3
6	Manipur University	Imphal	1	1	1	4	10	17	13
7	Central Agricultural University	Imphal	-	-	-	1	2	3	3
8	North Eastern regional Institute of Science & Technology	Itanagar	1	-	2	1	1	5	4
9	Indian Institute of Technology	Guwahati	-	1	2	7	-	10	8
10	Assam Agricultural University	Guwahati	-	1	1	4	-	6	6
11	Gauhati University	Guwahati	1	1	4	8	11	25	10
12	Regional Research Laboratory	Jorhat	1	-	3	-	-	4	4
13	Toklai Experimental Station	Jorhat	-	-	1	1	-	2	2
14	Assam University	Silchar	-	-	2	2	3	7	5
15	Regional Engineering College	Silchar	1	-	1	7	-	9	2
16	Dibrugarh University	Dibrugarh	-	2	4	3	-	9	6
17	Guwahati Medical College	Guwahati	2	-	-	-	-	2	2
18	Nagaland University	Kohima	-	-	1	2	-	3	3
19	Regional Institute of Medical Sciences	Imphal	1	2	2	2	5	12	10
20	National Institute of Rural Development	Guwahati	-	-	1	1	-	2	1
21	Assam Agricultural University	Jorhat	-	-	2	3	2	7	1
22	Arunachal University	Itanagar	1	-	2	1	-	4	1
Total		22	11	9	38	60	45	163	103

3.4 THE SAMPLE

The sample for the study comprises of library professionals working in the selected ²² 21 libraries. These include the Librarian or the Chief Librarian, Deputy Librarian, Assistant Librarian, Professional Assistant and Semi-professional Assistant

and having a minimum qualification of Bachelor degree in Library and Information Science. For the purpose of this study, Documentation Officer, Information Scientist and Technical Officer were grouped as one category and treated as Assistant Librarian on the basis that they were of the same rank and having the same pay scale. A total of 163 respondents are listed as shown in Table-3.1 (List of libraries in North-East India).

3.5 THE SURVEY QUESTIONNAIRE

A questionnaire booklet (Annexure-III) based on various studies and scales available was prepared. There was a total of 79 items, which were divided into the following three sections.

3.5.1 ATTITUDES TOWARD COMPUTER

Attitudes towards Computer scale developed and tested by Pareek et al. (1979) was used for the study. There were a total of 39 items in this scale. The scale items were averaged on five point Likert-type rating scale ranging from Strongly agree (SA), Agree (A), Uncertain (U), Disagree (D), and Strongly disagree (SD). Some examples from the questionnaire are given below:

- | | | | | | |
|--|----|---|---|---|----|
| 1. Computers can simplify complex problems. | SA | A | U | D | SD |
| 2. I would enjoy learning about the basics of computers and their abilities. | SA | A | U | D | SD |
| 3. Society relies too heavily on computers. | SA | A | U | D | SD |

- | | | | | | |
|--|----|---|---|---|----|
| 4. The use of computers is a threat to the employees position. | SA | A | U | D | SD |
| 5. The use of computers in my library have made my routine tasks more stimulating. | SA | A | U | D | SD |

3.5.2 ATTITUDES TOWARD INFORMATION TECHNOLOGY

Attitudes toward Information Technology scale developed and tested by Nair (1998) was used. This scale was also based on the five point Likert-type rating scale ranging from Strongly agree (SA), Agree (A), Uncertain (U), Disagree (D), and Strongly disagree (SD). There were a total of 29 items in this scale. Some examples from the questionnaire are given below:

- | | | | | | |
|---|----|---|---|---|----|
| 1. The concept 'Library is a social institution' becomes meaningless with the application of Information Technology to libraries. | SA | A | U | D | SD |
| 2. Information Technology has enabled users to have greater access and more accurate information in the libraries. | SA | A | U | D | SD |
| 3. Information Technology has helped in saving the time of the users and library professional. | SA | A | U | D | SD |
| 4. Library professionals are now more satisfied with their job on account of Information Technology. | SA | A | U | D | SD |
| 5. The benefit of Information Technology outweigh its monetary costs. | SA | A | U | D | SD |

3.5.3 SOCIO-ECONOMIC VARIABLES

The last section of the questionnaire consisted of 8 items on socio-economic variables. The socio-economic variables identified were age, sex, designation, professional qualification, academic qualification, working experience in the present library, overall working experience in libraries and working experience with computers. In addition to the socio-economic variables, there were items pertaining to 'Information Science Courses' taken by the respondents. The courses were divided into nine categories (Yoo, 1988 and Fosdick, 1978). In addition to this, another category 'any others' was added to identify other courses besides 'Information Science Courses' that were not covered by the category mentioned earlier. For each course, data on the nature of the course were collected. Further, the questionnaire had provision to collect information on attendance of in-service training, sponsors of in-service training, duration of computers installed in the library and types of library software used by the library professionals.

3.6 DATA COLLECTION

The questionnaires were distributed to a total population of 163 respondents. The questionnaires were distributed personally by visiting each library. Most of the questionnaires were collected personally but in some cases where respondents showed inability to fill up the questionnaire on the same day, a self addressed stamped envelope was given at the time of distribution for mailing it back. Out of the total 163 questionnaires, 122 questionnaires were received. After scrutiny, it was found that 19

questionnaires were partially filled up; the last section of the questionnaire was left unfilled. It was decided not to include these incomplete questionnaires for the final analysis. Therefore only 103 questionnaires were finally selected for the analysis giving a response rate of 63.19%.

3.7 DATA ANALYSIS

The data was tabulated and fed into computer. A matrix of 103 observations against 81 variables was prepared. The tabulated data from section I and II of the questionnaire was subjected to factor analysis.

3.7.1 FACTOR ANALYSIS

Factor analysis is a data reduction process but it differs from principal component analysis (PCA). Factor analysis is frequently used where there is a need to see a relatively large number of measures reduced to fewer, more basic underlying variables. It is used as a means of detecting underlying structures or order among variables. These new composite variables or factors derive their identity from the context of the variables with which they are strongly correlated. These correlations are called factor loadings.

According to Kerlinger (1973), "Factor analysis is a method of determining the number and nature of the underlying variables among larger number of measures. More succinctly, it is a method for determining k underlying variables (factors) from n sets of measures, k being

less than n . It may also be called a method for extracting common factor variances from sets of measures.”

To reveal the multiple dimensions produced by factor analysis, factor loadings are rotated according to various criteria, the most common of which is the varimax rotation. The rotation procedure groups variables that tend to correlate highly with some factors and considers them together. This allows factors to be defined in terms of the variables with which they are highly correlated.

McGrath et al. (1969) applied factor analysis to a formula for determining library collection allocations of academic departments. Data on 22 variables used for developing an allocation formula was analyzed using multiple co-relation and factor analysis. Noble and Conner (1986) applied factor analysis to determine attitude toward technology use. Yoo (1988) applied factor analysis to study the attitude of academic librarians towards computer technology. Phillips and Lyons (1990) used factor analysis to identify relationship among faculty regarding library policy. Saraf (1995) applied factor analysis for determining leadership styles and their effectiveness in the management of University libraries in India. Rahman (1999) and Bharali (2000) also applied factor analysis to identify various information needs, channels, sources and barriers. Jerabak et al. (2001) applied factor analysis to test the validity of two attitude scales. Speier et al. (2001) also

applied factor analysis to find the attitudes toward computers and its impact on performance.

39 items in section I of the questionnaire 'Attitudes towards Computers' and 29 items in section II of the questionnaire 'Attitudes towards Information Technology' were subjected to factor analysis with varimax rotation and the inferred factors were named appropriately. Analysis of variance (ANOVA) was applied to identify the relationship among 'Attitudes towards Information Technology' and Socio-economic variables. The following analysis was performed using SPSS 7.5 version.

- (i) Combined factor analysis on section I 'Attitudes towards Computers' and section II 'Attitudes towards Information Technology' of the questionnaire was carried out in order to identify the underlying dimensions of library professional's Attitudes towards Information Technology.
- (ii) Intercorrelations among factors obtained from the factor analysis.
- (iii) Descriptive statistics on the Socio-economic variables gathered through section III of the questionnaire.
- (iv) Intercorrelations among Socio-economic variables and one-way analysis of variance (ANOVA) on factors with Socio-economic variables to investigate whether there are significant differences among different groups of respondents.

CHAPTER – 4

ATTITUDES TOWARDS INFORMATION TECHNOLOGY: FACTOR ANALYSIS

4.0 INTRODUCTION

Factor analysis is a data reduction process which is frequently used where there is a need to see a relatively large number of measures reduced to fewer, more basic underlying variables. It is used as a means of detecting underlying structures or order among variables. The tabulated data was subjected to factor analysis in order to identify and group the variables that are related.

4.1 ATTITUDES TOWARDS COMPUTERS: *Factor analysis*

The scale developed by Pareek et al. (1979) was used to measure attitudes towards computers. Thirty nine items of section I of the questionnaire 'Attitudes toward Computers' were analyzed and examined to identify the underlying dimensions of library professionals' attitudes towards computers. The thirty nine items of the scale was submitted to factor analysis with varimax rotation. A total of 13 factors were loaded, each having eigenvalue greater than one. The factor loadings were retained on the basis of the following principles:

- (i) Factor loading of each item was not less than 0.35;
- (ii) More than 3 items with above mentioned loadings were on one factor; and
- (iii) Items having significant loadings on more than three factors were credited to the factor on which the loading was highest.

Using the above criteria, 5 factors out of 13 factors were thus identified out of 13 factors which are shown in Table-4.1.

Table-4.1 Attitudes towards computers: factor analysis

Sl No	Items	Factors				
		1	2	3	4	5
01	I would like to use a computer	0.151	0.262	0.046	0.608	0.185
02	Computers can simplify complex problems	0.668	0.019	-0.041	0.253	-0.074
03	Computers would be helpful in my line of work	-0.113	0.133	0.118	0.630	-0.034
04	Information produced by computers are too detailed	0.072	-0.548	0.370	-0.020	-0.127
05	I enjoy learning a new computer programme	0.035	0.154	0.244	0.369	0.272
06	I would enjoy learning about the basics of computers and their abilities	0.218	0.035	0.067	0.851	0.015
07	Computers are a great boon to humanity	0.067	0.545	-0.010	-0.155	0.027
08	The use of computers is a threat to the employee's position	0.092	-0.078	0.576	0.045	-0.027
09	Information produced by computer is very accurate	0.057	0.017	-0.039	0.058	0.698
10	Information produced by computers is recent and timely	0.092	0.297	-0.057	-0.041	0.468
11	Correction of errors in computers can be done easily and quickly	0.772	0.091	0.154	0.158	0.037
12	Computers might be useful but the results are not always encouraging	-0.016	0.106	0.736	0.092	0.126
13	The use of computers goes against the interest of the employees and should not be encouraged	0.143	0.031	0.452	0.286	-0.137
14	All libraries should make use of computers as far as possible	0.340	0.159	-0.086	0.632	0.082
15	Computers have great uses in libraries because of its vast storage capacity	0.664	-0.035	-0.013	0.264	0.217
16	If judiciously used computers can be useful in several areas of the library	0.746	0.063	0.145	0.195	-0.036
17	Computers does not supplant (substitute for) but supplement the library profession	0.215	0.119	0.302	-0.023	0.455
18	All libraries should make use of the computers for its development programmes	0.688	0.155	0.014	0.134	0.102
19	Computers are good for the library professionals but bad for the non-professionals	0.093	-0.186	0.520	0.323	0.376
20	Computers are not useful in small libraries	0.120	0.240	0.455	0.021	0.011
21	The poor shape of academic and research libraries can be improved with judicious use of computers	0.698	0.144	0.173	0.045	0.227
22	It is difficult to have access to computer services in my library	-0.034	0.309	0.575	-0.085	0.133
23	The use of computers in my library have made my routine tasks more stimulating	0.289	0.564	0.167	0.300	0.053
24	Computers have great potential for use in library clerical operations	0.615	0.286	0.089	-0.153	0.029
25	I have been able to adapt to the changes brought upon by the addition of computers to my present workplace	0.126	0.200	0.099	0.632	0.010
26	The use of computers in the library and the effect on my position in the library is threatening	-0.019	0.153	0.800	0.096	0.163
27	The pace with which computers are introduced and accepted in the library is frightening	0.249	0.053	0.664	-0.020	0.010
28	Having computers in my workplace, I am more dedicated to the tasks that I have to perform	0.148	0.715	0.114	0.326	-0.051
29	I am motivated to work more efficiently	0.156	0.726	0.108	0.248	-0.025
Eigenvalue		8.676	2.749	3.879	3.624	3.131
Percentage of variance		22.224	7.050	9.944	9.291	8.029

Note n = 103, Factor 1=Use Confidence, Factor 2=Work performance and Factor 3=Anxiety Factor 4=Acceptance, and Factor 5 = Efficiency

The above table shows that a total of 29 items out of 39 loaded on 5 factors with a total of 68.92% of variance. The naming and description of the factors^{are} (is) as follows:

4.1.1 FACTOR 1: *Use Confidence*

Seven items loaded on this factor. The loadings ranged from 0.772 to 0.615. The items loaded are as follows:

1. Correction of errors in computers can be done easily and quickly (0.772),
2. If judiciously used computers can be useful in several areas of the library (0.746),
3. The poor shape of academic and research libraries can be improved with judicious use of computers (0.698),
4. All libraries should make use of the computers for its development programmes (0.688),
5. Computers can simplify complex problems (0.668),
6. Computers have great uses in libraries because of its vast storage capacity (0.664), and
7. Computers have great potential for use in library clerical operations (0.615)

Eigenvalue of this factor is 7.356 and percentage of variance is 18.862%. All the seven items emphasizes on the advantage of using computers in the library.

4.1.2 FACTOR 2: *Work Performance*

Four items loaded on this factor with loadings ranging from 0.726 to 0.545. The loaded items are as follows:

1. I am motivated to work more efficiently (0.726),
2. Having computers in my workplace, I am dedicated to the tasks I have to perform (0.715),
3. The use of computers in my library has made my routine tasks more stimulating (0.564) and
4. Computers are a great boon to humanity (0.545).

The emphasis here is on motivation and dedication. Eigenvalue of the factor is 2.749 and percentage of variance is 7.050 %.

4.1.3 FACTOR 3: *Anxiety*

Nine items loaded on this factor with loadings ranging from 0.800 to 0.370. The items loaded are presented below:

1. The use of computers in the library and the effect on my position in the library is threatening (0.800),
2. Computers might be useful but the results are not always encouraging (0.736),

3. The pace with which computers are introduced and accepted in the library is frightening\ (0.664),
4. The use of computers is a threat to the employees position\ (0.576),
5. It is difficult to have access to computer services in my library (0. 575),
6. Computers are good for the library professionals but bad for the non-professionals (0.520),
7. Computers are not useful in small libraries (0.455),
8. The use of computers goes against the interest of the employees and should not be encouraged (0.452) and
9. Information produced by computers are too detailed (0.370).

All the loaded items emphasizes on threat, fright and apprehension. Eigenvalue of the factor is 3.879 and percentage of variance is 9.944.

4.1.4 FACTOR 4: *Acceptance*

Six items loaded on this factor with loadings ranging from 0.851 to 0.369. The items are listed as follows:

1. I would enjoy learning about the basics of computers and their abilities (0.851),

2. I have been able to adapt to the changes brought upon by the addition of computers to my present workplace (0.632),
3. All libraries should make use of computers as far as possible (0.632),
4. Computers would be helpful in my line of work (0.630),
5. I would like to use a computer (0.608) and
6. I enjoy learning a new computer program (0.369).

The emphasis given here is on adaptation and learning. The eigenvalue of the factor is 3.624 and percentage of variance is 9.291.

4.1.5 FACTOR 5: *Efficiency*

Three items loaded on this factor with loadings ranging from 0.698 to 0.455. The items are listed as follows:

1. Information produced by computer is very accurate (0.698),
2. Information produced by computers is recent and timely (0.468), and
3. Computers does not supplant (substitute for) but supplement the library profession (0.455).

The eigenvalue of the factor is 3.131 and percentage of variance is 8.029. All the three items emphasizes on efficiency.

Chapter heading as well
as sub headings of sections
1.2 and 1.4 are same. 06

4.2 ATTITUDES TOWARD INFORMATION TECHNOLOGY: *Factor analysis*

The twenty nine items of section II of the questionnaire 'Attitudes towards information technology' were analyzed and examined to identify the underlying dimensions of library professionals' attitudes towards information technology. The scale developed and tested by Nair (1998) was used to measure 'Attitudes toward information technology'. The tabulated data from the 29 items which make up this section were submitted to factor analyses using varimax rotation. A total of nine factors loaded having eigenvalue greater than one. Only three factors were retained for the analysis based on the following criteria:

- (i) Factor loading of each item was not less than 0.35;
- (ii) More than 3 items with above mentioned loadings were on one factor; and
- (iii) Items having significant loadings on more than three factors were credited to the factor on which the loading was highest.

The details of the factor loadings are shown in Table-4.2

Table-4.2 Attitudes towards information technology: factor analysis

Sl. No.	Items	Factors		
		1	2	3
01	The concept 'Library is a social institution' becomes meaningless with the application of Information Technology to libraries	-0.025	0.318	0.530
02	Library professional will need adequate training/knowledge in Information Technology in order to implement Information Technology successfully to library	0.470	0.334	0.264
03	With the fast changing scenario of Information Technology, application of Information Technology would become obsolete the moment it has completed installation	-0.084	0.123	0.558
04	Information Technology has greatly improved the existing condition of library services	0.716	0.271	0.044
05	Information Technology has enabled users to have greater access to more accurate information in the libraries	0.615	0.055	0.055
06	Resource sharing among different libraries has been greatly enhanced by application of Information Technology	0.781	-0.203	-0.203
07	Information Technology has helped in saving the time of the users and library professional	0.603	0.088	0.088
08	Information Technology has eliminated the dull, repetitive and routine work of the library professional	0.157	0.601	-0.057
09	Information Technology has enabled users to have information at a shorter span of time	0.579	0.305	0.305
10	Information search and retrieval (eg catalogue search) has become easy and fast because of Information technology in the libraries	0.761	0.116	0.116
11	Library professional have become more efficient in their work and their performances have greatly improved because of the application of Information Technology	0.425	0.466	-0.050
12	Library professionals are now more satisfied with their job on account of Information Technology	0.568	0.370	-0.04
12	Library professionals not skilled in Information Technology have lost their job, position, or displaced because of the influx of the new professionals (skilled in Information Technology) to libraries	-0.162	0.019	0.672
14	Library professionals are apprehensive about the effect of Information Technology on their health, i.e., monitor radiation, eye strain, body posture, backache, stress on the fingers etc	0.053	-0.077	0.744
14	Library professionals feel (the) their professional status has been enhanced because of Information Technology in their workplace	0.540	0.217	0.229
16	A library having Information Technology facilities generates more interest and encourages more users	0.695	0.079	0.217
17	A library having Information Technology facilities is considered more prestigious than a library without Information Technology	0.282	0.619	-0.187
18	Information Technology has improves the decision making process of the management and hence more efficient library management	0.239	0.496	-0.286
19	The benefit of Information Technology outweigh its monetary costs	0.143	0.712	-0.045
20	Scientists and researchers are adequately served with the existing Information Technology facilities in the library	0.753	0.168	0.091
21	The abilities of the library professionals will not be properly utilised if Information Technology is used in the library	0.086	-0.035	0.640
22	Information Technology may cause a feeling of personal inadequacy among the library professionals	0.417	0.165	0.539
23	Information Technology will enable library professionals to have more free time to do more interesting and imaginative work i.e., more time for making decisions, planning and supervision	0.423	0.341	0.176
24	Information Technology can force the complete retraining of the library professionals to do other duties more difficult than the routine ones	-0.038	-0.162	0.699
25	Information Technology can reduce the level and the quality of interpersonal communication	0.110	-0.113	0.806
26	Information Technology can change professional 'territorial' workplace to something uncomfortable, even alien	0.005	0.284	0.665
Eigenvalue		9.312	3.053	4.557
Percentage of variance		32.109	10.530	15.716

Note: n = 103, Factor 1 = Efficiency, Factor 2 = Work performance and Factor 3 = Anxiety

It is evident from the above table that out of 29 items, 26 items loaded on 3 factors accounting for 66.054 percentage of variance. The factors are named and described as follows:

4.2.1 FACTOR 1: *Efficiency*

Twelve items loaded on factor 1, with loadings ranging from 0.781 to 0.423. The factor loadings are listed as follows:

1. Resource sharing among different libraries has been greatly enhanced by application of information technology(0.781),
2. Information search and retrieval (eg. Catalogue search) has become easy and fast because of information technology in the libraries(0.761),
3. Scientists and researchers are adequately served with the existing information technology facilities in the library (0.753),
4. Information technology has greatly improved the existing condition of library service (0.716),
5. A library having information technology facilities generates more interest and encourages more users (0.695),
6. Information technology has enabled users to have greater access and more accurate information in the libraries (0.615),

7. information technology has helped in saving the time of the users and library professional (0.603),
8. Information technology has enabled users to have information at a shorter span of time (0.579),
9. Library professional are now more satisfied with their job on account of information technology (0.568),
10. Library professionals feel ^{that} ~~the~~ their professional status has been enhanced because of information technology in their workplace (0.540),
11. Library professional will need adequate training/knowledge in information technology in order to implement information technology successfully to library (0.470), and
12. Information Technology will enable library professionals to have more free time to do more interesting and imaginative work. i.e., more time for making decisions, planning and supervision (0.423).

It is clearly seen that the emphasis here is on library efficiency, time saving, ease of use, satisfaction, greater access and accuracy. The eigenvalue of the factor is 9.312 and the percentage of variance is 32.109.

4.2.2 FACTOR 2: *Work Performance*

Five items loaded on this factor with loadings ranging from 0.712 to 0.466. The factor loadings are listed as follows:

1. The benefit of information technology outweigh its monetary costs (0.712),
2. A library having information technology facilities is considered more prestigious than a library without information technology (0.619),
3. Information Technology has eliminated the dull, repetitive and routine work of the library professional (0.601),
4. Information technology has improved the decision making process of the management and hence more efficient library management (0.496), and
5. Library professional have become more efficient in their work and their performances have greatly improved because of the application of information technology (0.466).

The items in this factor emphasizes on prestige, costs, and performance. The eigenvalue of the factor is 3.053 and the percentage of variance is 10.109.

4.2.3 FACTOR 3: *Anxiety*

Nine items loaded on this factor, ranging from 0.806, and 0.530. The factor loadings are given as follows:

1. Information Technology can reduce the level and the quality of interpersonal communication (0.806),
2. Library professionals are apprehensive about the effect of information technology on their health, i.e., monitor radiation, eye strain, body posture, backache, stress on the fingers, etc. (0.744),
3. Information technology can force the complete retraining of the library professional to do ^{the} duties more difficult than the routine ones (0.699),
4. Library professionals not skilled in information technology have lost their job, position, or displaced because of the influx of the new professionals (skilled in information technology) to libraries (0.672),
5. Information Technology can change professional 'territorial' workplace to something uncomfortable, even alien (0.665),
6. Information Technology may cause a feeling of personal inadequacy among the library professionals (0.640),
7. With the fast changing scenario of information technology, application of information technology would become obsolete the moment it has completed installation (0.558),
8. Information technology may cause a feeling of personal inadequacy among the library professional (0.539), and
9. The concept 'Library is a social institution' becomes meaningless with the application of information technology to libraries (0.530).

The emphasis here is on personal inadequacy, retraining, and displacement from position or jobs and health anxiety. The eigenvalue of the factor is 4.557 and the percentage of variance is 15.716.

4.3 COMPUTERS VERSUS INFORMATION TECHNOLOGY

In order to compare the results of the factor analysis of 'Attitudes towards computers' and 'Attitudes towards information technology' the factors are presented in a tabular form, as shown in Table-4.3 which summarizes the factors.

Table-4.3 Factor summary of attitudes towards information technology

Section	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Attitudes towards Computers	Use confidence	Acceptance	Anxiety	Work Performance	Efficiency
Attitudes towards Information Technology	—	—	Anxiety	Work Performance	Efficiency

The above table clearly indicates that three factors, i.e. 'Anxiety', 'Work Performance' and 'Efficiency' are common to both sections. Whereas, 'Attitudes towards Computers' have two more extra factors, namely, 'Use Confidence' and 'Acceptance'. Computer application is one of the important components of

Information technology, however information technology has other components like networking, online access and internet etc. Moreover, while analyzing the physical facilities of various libraries under study, it is found that even if these libraries have computers, the other components of information technology are lacking. Therefore, differentiating between 'Attitudes towards computers' and 'Attitudes towards information technology' becomes difficult in relation to the libraries under study.

On further observation, the factor 'Efficiency' of 'Attitudes towards computers' and 'Attitudes towards information technology' has for example the items, '*Information produced by computer is very accurate*' and '*Information produced by computers is recent and timely*' (Computers) which is similar to '*Information search and retrieval (e.g. Catalogue search) has become easy and fast because of information technology in the libraries*' and '*Information Technology has helped in saving the time of the users and library professional*' (Information Technology).

By comparing the factor 'Anxiety' from 'Attitudes towards computers' with factor 'Anxiety' of 'Attitudes towards information technology' which listed items, for example, '*The use of computers in the library and the effect on my position in the library is threatening*' and '*The pace with which computers are introduced and accepted in the library is frightening*' (computers) is similar to '*Library professionals not skilled in information technology have lost their job, position, or displaced*

because of the influx of the new professionals (skilled in information technology to libraries' and 'Information technology may cause a feeling of personal inadequacy among the library professional' (Information Technology).

On comparing the factor 'Work Performance' of 'Attitudes towards computers' with the factor 'Work Performance' of 'Attitudes towards information technology', it can be observed that items, for example, '*I am motivated to work more efficiently*' and '*Having computers in my workplace, I am dedicated to the tasks I have to perform*'(Computers), is similar to '*Information Technology has eliminated the dull, repetitive and routine work of the library professional*', and '*Library professional have become more efficient in their work and their performances have greatly improved because of the application of information technology*' (Information Technology).

Since three factors namely, Efficiency, Anxiety and Work Performance are occurring and overlapping in both 'Attitudes towards computers' and 'Attitudes towards information technology', therefore, for the purpose of ^his study, 39 items of section I of the questionnaire 'Attitudes towards computers' and 29 items of section II 'Attitudes towards information technology' were merged together and subjected to factor analysis. Thus for the purpose of this study the terms 'Attitudes towards Computers' and

'Attitudes towards information technology' will be represented by the term 'Attitudes towards information technology' for further analysis.

4.4 ATTITUDES TOWARD INFORMATION TECHNOLOGY: *Factor analysis*

A total of 68 variables taken together from section I of the questionnaire 'Attitudes towards Computers' and from section II of the questionnaire 'Attitudes towards information technology' were subjected to factor analysis with varimax rotation. A total of 21 factors were loaded amounting to 74.53% of variance. Out of the 21 factors, 10 factors were retained based on the following criteria:

- (i) Factor loading of each item was not less than 0.35;
- (ii) More than 3 items with above mentioned loadings were on one factor; and
- (iii) Items having significant loadings on more than two factors were credited to the factor on which the loading was highest.

The details of the factor loadings obtained are shown in Table-4.4

Table-4.4 Factor loadings: attitudes towards information technology

SI No	Items	Factors									
		1	2	3	4	5	6	7	8	9	10
01	I would like to use a computer	0.051	0.279	0.216	0.142	0.114	0.132	-0.029	0.270	0.442	0.078
02	Computers would be helpful in my line of work	0.052	0.577	0.166	0.077	0.024	0.063	-0.116	0.236	0.131	0.328
03	Machine response time of computers are very slow	0.182	0.084	0.176	0.250	0.004	-0.063	-0.008	-0.098	0.091	0.433
04	I would enjoy learning about the basics of computers and their abilities	0.004	0.030	0.195	0.056	0.027	-0.007	0.087	-0.111	0.799	-0.034
05	Computers are a great boon to humanity	0.202	0.386	0.054	0.077	-0.128	-0.214	0.348	-0.245	-0.080	0.243
06	The use of computers is a threat to the employee's position	-0.011	0.009	0.036	-0.024	0.035	0.786	0.149	0.007	0.155	0.083
07	Information produced by computer is very accurate	0.184	-0.100	0.031	0.729	0.138	0.072	0.077	-0.082	0.270	0.087
08	Information produced by computers is recent and timely	0.145	0.398	0.040	0.616	-0.203	-0.034	-0.026	-0.113	-0.104	-0.040
09	Computers in library are very difficult to use	0.258	-0.045	0.279	0.195	0.542	0.142	0.130	0.106	-0.101	-0.029
10	The utility of computers is highly limited	0.252	0.090	0.279	0.075	0.185	0.116	0.391	0.240	0.063	-0.011
11	Computers might be useful but the results are not always encouraging	0.069	0.072	0.017	0.183	0.351	0.222	0.131	0.066	-0.043	0.400
12	The use of computers goes against the interest of the employees and should not be encouraged	0.005	-0.010	0.320	0.207	0.023	0.606	0.026	-0.080	-0.140	0.030
13	Libraries in India are not ready for computers and will not be ready for quite sometime	0.039	-0.052	0.049	0.200	0.452	-0.009	0.0125	-0.185	0.074	0.161
14	All libraries should make use of computers as far as possible	0.146	0.210	0.407	0.032	0.222	-0.097	-0.301	0.097	0.140	0.193
15	Computers have great uses in libraries because of its vast storage capacity	0.129	0.110	0.734	0.144	0.078	0.034	-0.006	0.039	0.169	-0.089
16	If judiciously used computers can be useful in several areas of the library	0.068	0.058	0.782	-0.066	0.002	0.103	0.091	-0.152	0.050	0.043
17	Computers are too expensive for a library because of its limited budget	-0.090	0.021	0.158	-0.046	0.406	-0.024	0.062	-0.127	0.050	0.042
18	Computers are good for the library professionals but bad for the non-professionals	-0.069	0.035	0.051	0.032	0.760	0.081	-0.050	0.071	0.093	0.045
19	The poor shape of academic and research libraries can be improved with judicious use of computers	0.147	0.137	0.519	0.259	0.308	0.202	0.296	-0.129	0.106	-0.093
20	It is difficult to have access to computer services in my library	0.220	0.073	-0.178	0.095	0.393	0.259	0.161	-0.078	0.385	0.113
21	The use of computers in my library have made my routine tasks more stimulating	0.247	0.369	0.300	-0.002	0.040	0.061	0.273	0.052	0.291	0.249
22	Computers have great potential for use in library clerical operations	0.209	0.161	0.429	-0.024	-0.042	0.057	0.155	-0.301	0.084	-0.041
23	I have been able to adapt to the changes brought upon by the addition of computers to my present workplace	0.009	0.299	0.280	-0.029	0.434	0.014	0.087	0.110	0.509	0.296
24	The use of computers in the library and the effect on my position in the library is threatening	0.247	0.175	-0.059	0.095	0.047	0.590	0.092	0.129	-0.107	0.084
25	The pace with which computers are introduced and accepted in the library is frightening	0.107	0.036	0.104	-0.024	0.140	0.430	0.214	-0.105	0.076	0.037

Table-4.4 Factor Loadings: Attitudes towards Information Technology (continued)

Sl. No.	Items	Factors									
		1	2	3	4	5	6	7	8	9	10
26	Having computers in my workplace, I am more dedicated to the tasks that I have to perform	0.061	0.776	0.109	-0.066	0.081	-0.091	0.009	-0.047	0.045	0.037
27	I am motivated to work more efficiently	0.051	0.822	0.142	0.071	-0.024	0.087	0.036	-0.104	0.089	0.091
28	Library professional will need adequate training/knowledge in Information Technology in order to implement Information Technology successfully to library	0.494	0.128	0.257	-0.150	0.005	0.339	-0.160	0.184	0.107	0.005
29	Information Technology has greatly improved the existing condition of library services	0.503	0.345	0.170	0.034	0.463	-0.051	0.020	0.036	-0.039	0.078
30	Information Technology has enabled users to have greater access to more accurate information in the libraries	0.756	0.016	0.151	0.070	-0.022	0.009	0.030	0.093	-0.160	0.019
31	Resource sharing among different libraries has been greatly enhanced by application of Information Technology	0.759	-0.118	0.056	0.070	0.009	0.010	0.056	-0.185	0.085	0.279
32	Information Technology has helped in saving the time of the users and library professional	0.645	0.316	0.222	0.039	-0.018	-0.036	0.125	0.146	0.094	-0.045
33	Information Technology has eliminated the dull, repetitive and routine work of the library professional	0.407	0.147	0.129	0.130	-0.041	0.146	0.074	0.086	0.151	-0.080
34	Information Technology has enabled users to have information at a shorter span of time	0.574	0.386	0.116	0.192	-0.183	-0.032	0.093	-0.122	-0.096	-0.079
35	Information search and retrieval (eg. catalogue search) has become easy and fast because of Information technology in the libraries	0.669	0.261	0.082	0.198	-0.129	0.061	0.146	-0.104	0.026	-0.027
36	Library professional have become more efficient in their work and their performances have greatly improved because of the application of Information Technology	0.483	0.424	-0.027	0.375	0.083	0.040	-0.064	-0.042	0.146	-0.149
37	Library professionals are now more satisfied with their job on account of Information Technology	0.504	0.511	-0.229	0.197	0.041	0.070	-0.023	-0.012	0.022	-0.075
38	The introduction of Information Technology to libraries have paved the way for library professionals to provide efficient information services	0.213	0.374	0.023	0.396	-0.044	-0.035	-0.158	0.083	-0.037	0.139
39	Library professionals not skilled in Information Technology have lost their job, position, or displaced because of the influx of the new professionals (skilled in Information Technology) to libraries	0.045	-0.040	-0.017	0.021	-0.099	0.118	0.153	0.592	-0.102	0.036
40	Library professionals feel that their professional status has been enhanced because of Information Technology in their workplace	0.255	0.596	0.227	-0.059	0.076	0.196	0.168	-0.159	-0.096	0.045

Table-4.4 Factor Loadings: Attitudes towards Information Technology (continued)

Sl No	Items	Factors									
		1	2	3	4	5	6	7	8	9	10
41	A library having Information Technology facilities generates more interest and encourages more users	0.342	0.512	0.236	-0.028	0.192	0.102	-0.122	0.069	0.177	0.029
42	Information Technology has improved the decision making process of the management and hence more efficient library management	0.383	0.221	0.264	0.056	0.107	0.118	0.162	-0.349	0.279	-0.079
43	Information Technology leaves no incentive for the progress of library professionals	-0.033	0.079	-0.100	0.240	0.191	-0.142	0.438	0.031	0.018	-0.174
44	Scientists and researchers are adequately served with the existing Information Technology facilities in the library	0.438	0.560	-0.147	0.115	0.068	-0.091	0.051	0.045	0.210	-0.040
45	Information Technology may cause a feeling of personal inadequacy among the library professionals	0.343	0.038	-0.203	-0.012	0.217	0.184	0.298	0.368	0.066	0.103
46	Introduction of Information Technology in libraries may result in the reduction of the number of library professionals	-0.072	0.017	-0.228	-0.094	0.124	0.132	0.006	-0.017	-0.012	0.708
47	Information Technology will enable library professionals to have more free time to do more interesting and imaginative work i.e., more time for making decisions, planning and supervision	0.573	0.184	-0.106	0.069	0.311	0.088	-0.042	0.045	0.064	-0.210
48	Information Technology can force the complete retraining of the library professionals to do other duties more difficult than the routine ones	-0.023	-0.180	-0.119	-0.105	0.084	-0.094	-0.015	0.772	0.007	0.039
49	Information Technology can reduce the level and the quality of interpersonal communication	-0.123	0.114	0.233	0.161	0.130	0.038	0.502	0.157	0.079	0.199
50	Information Technology can change professional 'territorial' workplace to something uncomfortable, even alien	0.128	0.004	0.068	-0.021	-0.076	0.218	0.820	0.018	0.117	-0.042
	Eigenvalue	12.432	3.927	3.160	2.830	2.550	2.330	2.219	2.013	1.778	1.395
	Percentage of variance	18.282	5.775	4.647	4.162	3.749	3.427	3.263	2.960	2.614	2.052

Note n = 103, Factor 1 = Efficiency 1, Factor 2 = Work Performance, Factor 3 = Use Confidence, Factor 4 = Efficiency 2, Factor 5 = Anxiety 1, Factor 6 = Anxiety 2, Factor 7 = Anxiety 3, Factor 8 = Anxiety 4, Factor 9 = Acceptance and Factor 10 = Anxiety 5

The above table shows that a total of 50 items out of 68 loaded on 10 factors with a total of 50.93% of variance. The concise description of the items loaded is as follows:

4.4.1 FACTOR 1: *Efficiency-1*

Twelve items loaded on this factor such as ‘Information Technology has enabled users to have greater access to more accurate information in the libraries’ (0.756), and ‘Resource sharing among different libraries has been greatly enhanced by application of Information Technology’ (0.759).

4.4.2 FACTOR 2: *Work Performance*

This factor loaded eight items on ‘Work Performance’ such as ‘Having computers in my workplace, I am more dedicated to the tasks that I have to perform’ (0.776), ‘I am motivated to work more efficiently’ (0.822), and ‘Library professionals feel ^{that} ~~the~~ their professional status has been enhanced because of Information Technology in their workplace’ (0.596).

4.4.3 FACTOR 3: *Use Confidence*

Factor 3 has five items loading on ‘Use confidence’ such as ‘Computers have great uses in libraries because of its vast storage capacity’ (0.734), and ‘If judiciously used computers can be useful in several areas of the library’ (0.782).

4.4.4 FACTOR 4: *Efficiency-2*

Three items loaded on this factor with items similar to Factor-1 'Efficiency', such as 'Information produced by computer is very accurate' (0.726) and 'Information produced by computers is recent and timely' (0.616).

4.4.5 FACTOR 5: *Anxiety-1*

Factor 5 loaded five items related with 'Anxiety'. Some of the items loaded are 'Computers are good for the library professionals but bad for the non-professionals' (0.760), and 'Computers in library are very difficult to use' (0.542).

4.4.6 FACTOR 6: *Anxiety-2*

Again, this factor loaded four items on 'Anxiety' such as, 'The use of computers is a threat to the employee's position' (0.786), and 'The use of computers goes against the interest of the employees and should not be encouraged' (0.606),

4.4.7 FACTOR 7: *Anxiety-3*

Factor 7 loaded four items related with 'Anxiety'. Some examples are: 'Information Technology can change professional 'territorial' workplace to something uncomfortable, even alien' (0.820), and 'Information Technology can reduce the level and the quality of interpersonal communication' (0.508).

4.4.8 FACTOR 8: *Anxiety-4*

This factor loaded three items related with 'Anxiety'. Some examples are: 'Library professionals not skilled in Information Technology have lost their job, position, or displaced because of the influx of the new professionals (skilled in Information Technology) to libraries' (0.592), 'Information Technology can force the complete retraining of the library professionals to do other duties more difficult than the routine ones' (0.772).

4.4.9 FACTOR 9: *Acceptance*

Three items loaded on this factor such as 'I would enjoy learning about the basics of computers and their abilities' (0.799), and 'I have been able to adapt to the changes brought upon by the addition of computers to my present workplace' (0.509).

4.4.10 FACTOR 10: *Anxiety-5*

Factor 10 loaded three items of 'Anxiety' such as: 'Machine response time of computers is very slow' (0.433), 'Introduction of Information Technology in libraries may result in the reduction of the number of library professionals' (0.708).

4.5 FACTOR SUMMARY

The summary of the factor loadings discussed above are listed below:

Factor-1	- Efficiency-1
Factor-2	- Work Performance
Factor-3	- Use Confidence
Factor-4	- Efficiency-2
Factor-5	- Anxiety-1
Factor-6	- Anxiety-2
Factor-7	- Anxiety-3
Factor-8	- Anxiety-4
Factor-9	- Acceptance
Factor-10	- Anxiety-5

It is very evident that factors 'Efficiency' and 'Anxiety' loaded on more than one factor. 'Efficiency' loaded on two factors whereas 'Anxiety' is distributed over five factors. It was found suitable to merge all factors of 'Efficiency' to form one factor 'Efficiency' and all factors of 'Anxiety' be to form one factor 'Anxiety' respectively for better results. This is represented in the following Table-4.5.

Table-4.5 Final factors obtained

Sl. No.	Names	Factors	No. of items loaded
1	Efficiency	Efficiency 1 + Efficiency 2	15
2	Work Performance	Work Performance	8
3	Use Confidence	Use Confidence	5
4	Anxiety	Anxiety 1 + Anxiety 2 + Anxiety 3 + Anxiety 4 + Anxiety 5	19
5	Acceptance	Acceptance	3

4.6 FINAL FACTORS OF ATTITUDES TOWARDS INFORMATION TECHNOLOGY

The five final factors, derived as above and retained for further analysis are defined and discussed as follows:

4.6.1 FACTOR 1: *Efficiency*

The term Efficiency is defined as “*the ability of Information Technology in enabling library professionals to provide efficient information services, by providing accurate information to users at the shortest span of time*”. Fifteen items loaded on this factor. The loadings ranged from 0.759 to 0.383. The details of the loaded items are as follows:

1. Resource sharing among different libraries has been greatly enhanced by application of Information Technology (0.759),
2. Information Technology has enabled users to have greater access to more accurate information in the libraries (0.756),
3. Information produced by computer is very accurate (0.729),
4. Information search and retrieval (eg. catalogue search) has become easy and fast because of Information technology in the libraries (0.669),
5. Information Technology has helped in saving the time of the users and library professional (0.645),
6. Information produced by computers is recent and timely (0.616),

7. Information Technology has enabled users to have information at a shorter span of time (0.574),
8. Information Technology will enable library professionals to have more free time to do more interesting and imaginative work. i.e., more time for making decisions, planning and supervision (0.573),
9. Information Technology has greatly improved the existing condition of library services (0.503),
10. Library professional will need adequate training/knowledge in Information Technology in order to implement Information Technology successfully to library (0.494),
11. Library professional have become more efficient in their work and their performances have greatly improved because of the application of Information Technology (0.483),
12. Scientists and researchers are adequately served with the existing Information Technology facilities in the library (0.438),
13. Information Technology has eliminated the dull, repetitive and routine work of the library professional (0.407),
14. The introduction of Information Technology to libraries have paved the way for library professionals to provide efficient information services (0.396),
15. Information Technology has improves the decision making process of the management and hence more efficient library management (0.383).

Eigenvalue of this factor is 12.432 and percentage of variance is 18.282 %. The emphasis here is on efficiency of Information Technology in the library.

4.6.2 FACTOR 2: *Work Performance*

Work Performance is defined as “*the influence of Information Technology on the work performance of the library professionals by motivating them to be more dedicated towards work and thereby performing more efficiently*”. Eight items loaded on this factor with loadings ranging from 0.822 to 0.369. The list of the loaded items is as follows:

1. I am motivated to work more efficiently (0.822),
2. Having computers in my workplace, I am dedicated to the tasks I have to perform (0.776),
3. Library professionals feel their professional status has been enhanced because of Information Technology in their workplace (0.596),
4. Computers would be helpful in my line of work (0.577),
5. A library having Information Technology facilities generates more interest and encourages more users (0.512),
6. Library professionals are now more satisfied with their job on account of Information Technology (0.511),
7. Computers are a great boon to humanity (0.386),
8. The use of computers in my library has made my routine tasks more stimulating (0.369).

The terms used here are motivation, dedication and stimulation, all emphasizing on performance. Eigenvalue of the factor is 3.927 and percentage of variance is 5.775 %.

4.6.3 FACTOR 3: *Use Confidence*

Use Confidence is defined as “*the ability of library professionals to use Information Technology components in their workplace by being assured in the utility of Information Technology to perform various functions, hitherto done conventionally or manually*”. Five items loaded on this factor with loadings ranging from 0.782 to 0.407.

The loaded items are listed as follows:

1. If judiciously used computers can be useful in several areas of the library (0.782),
2. Computers have great uses in libraries because of its vast storage capacity (0.734),
3. The poor shape of academic and research libraries can be improved with judicious use of computers (0.519),
4. Computers have great potential for use in library clerical operations (0.429),
5. All libraries should make use of computers as far as possible (0.407).

The emphasis in this factor is on use of Information Technology. Eigenvalue of the factor is 3.160 and the percentage of variance is 4.647 %.

4.6.4 FACTOR 4: *Anxiety*

Anxiety is defined as “*fear, worry, threat or apprehension towards the use of Information Technology in the work place. It can be health anxiety, fear of Information Technology due to inexperience or lack of knowledge on Information Technology, being threatened by job insecurity/displacement, being worried of additional workload and responsibility*”. Nineteen items were combined in this factor with loadings ranging from 0.820 to 0.368. The loaded items are listed as follows:

1. Information Technology can change professional 'territorial' workplace to something uncomfortable, even alien (0.820),
2. The use of computers is a threat to the employee's position (0.786),
3. Information Technology can force the complete retraining of the library professionals to do other duties more difficult than the routine ones (0.772),
4. Computers are good for the library professionals but bad for the non-professionals (0.760),
5. Introduction of Information Technology in libraries may result in the reduction of the number of library professionals (0.708),
6. The use of computers goes against the interest of the employees and should not be encouraged (0.606),
7. Library professionals not skilled in Information Technology have lost their job, position, or displaced because of the influx of the new professionals (skilled in Information Technology) to libraries (0.592),

8. The use of computers in the library and the effect on my position in the library is threatening (0.590),
9. Computers in library are very difficult to use (0.542),
10. Information Technology can reduce the level and the quality of interpersonal communication (0.502),
11. Libraries in India are not ready for computers and will not be ready for quite sometime (0.452),
12. Information Technology leaves no incentive for the progress of library professionals (0.438),
13. Machine response time of computers are very slow (0.433),
14. The pace with which computers are introduced and accepted in the library is frightening (0.430),
15. Computers are too expensive for a library because of its limited budget (0.406),
16. Computers might be useful but the results are not always encouraging (0.400),
17. It is difficult to have access to computer services in my library (0.393),
18. The utility of computers is highly limited (0.391),
19. Information Technology may cause a feeling of personal inadequacy among the library professionals (0.368).

The emphasis here is on threat, fear and apprehension. Eigenvalue of the factor is 2.55 and percentage of variance is 3.749 %.

4.6.5 FACTOR 5: *Acceptance*

Acceptance is defined as “*adaptation to the Information Technology environment, by accepting Information Technology applications in the workplace, and thereby liking and enjoying the new environment*”. The three items loaded on this factor are presented as follows:

1. I would enjoy learning about the basics of computers and their abilities (0.799),
2. I have been able to adapt to the changes brought upon by the addition of computers to my present workplace (0.509),
3. I would like to use a computer (0.442).

The factor loading values are, and. The emphasis here is on acceptance. The eigenvalue of the factor is 1.778 and percentage of variance is 2.614 %.

4.7 INTERCORRELATION AMONG FACTORS

In order to identify the relationship between the factors, Pearson’s coefficient of correlation was computed between the factors. The intercorrelation, mean score, standard deviation and the ranks of Attitudes towards Information Technology are given in Table-4.6.

Table-4.6 Intercorrelation among factors

Sl.no	Attitude Towards Information Technology	Efficiency	Work Performance	Use Confidence	Anxiety	Acceptance
1	Efficiency	X				
2	Work performance	0.662**	X			
3	Use Confidence	0.461**	0.467**	X		
4	Anxiety	-0.352**	-0.342**	-0.377**	X	
5	Acceptance	0.318**	0.436**	0.469**	-0.414**	X
No. of items		15	8	5	19	3
Mean		28.4854	16.6505	8.4272	47.4563	5.2621
SD		7.1467	4.2512	2.0845	6.9378	1.4883
Rank		2	3	4	1	5

Note: $n = 103$, $*P = < 0.1$ and $**P = < 0.05$

The intercorrelation table presented above shows high correlation among the factors. Efficiency, Work Performance, Use Confidence, Anxiety and Acceptance are highly intercorrelated. The mean score and SD from the table shows that Anxiety ranks first, followed by Efficiency and Work Performance respectively. Use Confidence and Acceptance are ranked as the fourth and the fifth factors respectively. Work performance is positively correlated with Efficiency ($r = 0.662$). Use Confidence is positively correlated with Efficiency ($r = 0.461$) and with Work Performance ($r = 0.467$). Anxiety is negatively correlated with all the other factors i.e., with Efficiency ($r = -0.352$), with Work Performance ($r = -0.342$), with Use Confidence ($r = -0.377$) and with Acceptance ($r = -0.414$). Acceptance is positively correlated with Efficiency ($r = 0.318$), with Work Performance ($r = 0.436$) and with Use Confidence ($r = 0.469$). The strongest relationship is between Work Performance and Efficiency ($r = 0.662$). The second highest relation is between Acceptance and Use Confidence ($r = 0.469$).

From the analysis given above, it can be inferred that Work Performance, Use Confidence, Acceptance and Efficiency is lower if Anxiety levels are higher. Further, the highest positive correlation between Work Performance and Efficiency shows that higher the work performance, higher is the efficiency on the job. Since Anxiety is negatively correlated with all the other factors, it shows that higher the Anxiety levels, lower is the Use Confidence, Work Performance and Efficiency of work on the job. Even Anxiety level does not allow Acceptance of Information Technology as they are negatively correlated.

Some recent studies have focused on factors underlying the attitudes and behaviors of library professionals. The term 'Computer Anxiety', has been associated with library professionals in recent literature to describe their attitude and behaviour towards integration of information and technology in a modern library. Numerous definitions have been proposed for the term 'Computer anxiety', for example, "disabling levels of anxiety ... and internal dialog that belittles their ability and undermines their confidence" (Rosen et al., 1987); "fears concerning the computer itself, that is, jargon, technological trends, the 'paperless society'; worries about damaging the computer; the showing an inability to type" is a second example offered by Ovens (1991). Jerabek et al. (2001) studied the relationships between 'computer anxiety' and 'library anxiety' and have stated that they have been sometimes hypothesized as emotional responses to new technology. They used two scales namely, Computer Anxiety Index and Library Anxiety

Scale, which were multidimensional instruments that measured both anxiety and attitudes. Weil et al. (1987) have stated that “whether we call it ‘computer anxiety,’ ‘technostress,’ or ‘computerphobia,’ all estimates indicate that as many as one out of three adults suffers from aversive reactions to computers and computer-related technologies”. Sievert et al. (1988) identified several factors that influence computer anxiety in library staff. The principal determinant was experience with a computer i.e., the degree to which the staff of the libraries were already familiar with and using computers and number of years worked in the library.

4.8 CONCLUSION

Initial factor analysis of ‘Attitudes towards Computers’ resulted in 5 factors namely, ‘Anxiety, Efficiency, Work performance, Use confidence and Acceptance’. Further factor analysis of ‘Attitudes towards Information Technology’ resulted in 3 factors namely, ‘Efficiency, Work performance and Anxiety’. On further observation, it was seen that the factors were overlapping and similar because there is marginal difference between Computers and Information Technology. So, for the purpose of better result, ‘Attitudes towards Computers’ and ‘Attitudes towards Information Technology’ were merged together and factorized. This resulted in the identification of the following 10 factors:

Factor-1 - Efficiency-1

Factor-2 - Work Performance

Contents of this section are repetitive

Factor-3	- Use Confidence
Factor-4	- Efficiency-2
Factor-5	- Anxiety-1
Factor-6	- Anxiety-2
Factor-7	- Anxiety-3
Factor-8	- Anxiety-4
Factor-9	- Acceptance
Factor-10	- Anxiety-5

Since there were factors having common characteristics, for better analysis, similar factors were merged and five final factors were retained for further analysis as shows below:

1. Anxiety
2. Efficiency
3. Work Performance
4. Use Confidence
5. Acceptance.

CHAPTER – 5

ATTITUDES TOWARDS INFORMATION TECHNOLOGY AND SOCIO-ECONOMIC VARIABLES

5.0 INTRODUCTION

Many studies have been conducted to see whether socio-economic variables namely, age, sex, designation, professional qualifications, academic qualifications, present working experience in library and overall working experience in libraries have any relationship with attitudes towards information technology. Torkzadeh and Koufteros (1993) examined the change in attitudes namely 'Computer anxiety' that occur due to training intervention. Loyd and Gressard (1984) have studied the effects of sex, age and computer experience on attitudes towards information technology. Speier et al. (2002) has also identified that relationship between ease of use and performance almost doubles across training intervention. Therefore, in accordance with these trends, this study also examines the following assumptions:

- H₁. Attitudes of library professionals towards information technology will differ on the basis of socio-economic variables. The socio-economic variables identified are age, sex, designation, professional qualifications, academic qualifications, working experience in the present library and overall working experience in libraries.*

- H₂. Library professionals with experience on computer will show positive attitudes towards information technology as compared to library professionals without experience on computer. The experience on computers is defined as working experience with computers and duration of installation of computers in the library.*

- H₃. There is no relationship between attitudes towards information technology and information science courses taken by library professionals.*

5.1 SOCIO-ECONOMIC VARIABLES

Eight variables of Section III of the questionnaire represent the socio-economic variables. These are age, sex, designation, professional qualifications, academic qualifications, working experience in the present library, overall working experience in libraries and working experience with computers. The detailed description of each variable is given in the following tables:

5.1.1 AGE AND SEX

Age and sex of the respondents is shown in Table-5.1

Table-5.1 Age and sex of the respondents

Sl.No.	Age	Frequency	Percent	Cumulative percent
1	25 and below	—	—	—
2	26-30	17	16.51	16.51
3	31-35	23	22.33	38.84
4	36-40	17	16.51	55.35
5	41-45	13	12.62	67.97
6	46-50	15	14.56	82.53
7	51-55	11	10.68	93.21
8	Over 56	7	6.79	100.00
Total		103	100.00	
Sl.No.	Sex	Frequency	Percent	
1	Male	58	56.31	—
2	Female	45	43.69	—
Total		103	100.00	—

The above table clearly indicates that there are no respondents below 25 years of age. More than half of the respondents (55.35%) are up to the age of 40, whereas 67.97% of them are up to the age of 45 years. This clearly shows that majority of the respondents are young since only 17.47% of them are above ^{50?}56 years of age. It is also observed that majority of the respondents are male (56.31%) and the rest females (43.69%).

5.1.2 DESIGNATION

Table-5.2 shows the designation of the library professionals.

Table-5.2 Designation of the library professionals

Sl. No.	Designation	Frequency	Percent	Cumulative Percent
1	Librarian	7	6.79	6.79
2	Deputy Librarian	9	8.74	15.53
3	Assistant Librarian	24	23.30	38.83
4	Professional Assistant	39	37.87	76.70
5	Semi Professional Assistant	24	23.30	100.00
Total		103	100.00	

It is very evident from the table given above that majority of the respondents are working as Professional Assistants or Semi Professional Assistants (61.17%). Only 38.83% were on top level such as, Librarians, Deputy Librarians and Assistant Librarians. It is also very clear that only 7 institutions were ^{headed} manned by Librarians and 14 [^] institutions were either headed by Deputy Librarians or Assistant Librarians.

5.1.3 QUALIFICATIONS

For the purpose of this study, qualifications were divided into professional qualifications and academic qualifications. The details of the respondents regarding both the qualifications are given in Table-5.3.

Table-5.3 Qualifications of the library professionals

Sl. No	Degree	Professional Qualifications			Academic Qualifications		
		Frequency	Percent	Cumulative Percent	Frequency	Percent	Cumulative Percent
1	Bachelors	29	28.15	28.15	75	72.82	72.82
2	Masters	66	64.08	92.23	27	26.21	99.03
3	Doctorate	8	7.77	100.00	1	0.97	100.00
Total		103	100.00		103	100.00	

It is found from the table given above that majority of the library professionals (64.08%) have master degree in Library and Information Science. 29 professionals (28.15%) have bachelor degree and only 8 respondents (7.77) have doctoral degree in Library and Information Science. It is also observed that only 27 respondents (26.21%) have an additional master degree other than Library and Information Science and only 1 respondent ^{has} a doctoral degree in a subject other than Library and Information Science.

5.1.4 WORKING EXPERIENCE IN LIBRARIES

In order to investigate the relationship between the length of library experience and attitude towards computer and information technology, data on the years of experience in the current library and overall experience in libraries were collected.

Table-5.4 shows the working experience in the present library and overall experiences in libraries.

Table-5.4 Working experience in libraries

Sl.No.	Years	Experience in the present library			Overall experience in libraries		
		Frequency	Percent	Cumulative Percent	Frequency	Percent	Cumulative Percent
1	1-4	31	30.10	30.10	20	19.42	19.42
2	5-8	14	13.59	43.69	16	15.53	34.95
3	9-12	12	11.65	55.34	12	11.65	46.60
4	13-16	7	6.79	62.13	8	7.77	54.37
5	17-20	12	11.65	73.78	14	13.59	67.96
6	21-24	14	13.59	87.37	13	12.62	80.58
7	25-28	8	7.77	95.14	11	10.68	91.26
8	29-32	4	3.88	99.2	8	7.77	99.03
9	33 and above	1	0.97	99.99	1	0.97	100.00
Total		103	103		103	103	

The above table indicates that majority of library professionals have been working in the present library up to 12 years (55.34%). There seem few library professionals who have put in more than 25 years of experience and above. This shows that majority of the library professionals are younger (below 40 years) as also indicated in the age table (Table-5.1). Majority of the respondents (30.10%) indicates up to 4 years of experience in the present library.

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5.1.5 WORKING EXPERIENCE WITH COMPUTERS

The assumption being that longer a person works with computers, positive the attitudes towards information technology. The data on the length of time the library professional has worked with a computer on the job was collected. The statement 'I have worked with a computer on the job for _____ years' was asked to test this relationship. Table-5.5 shows working experience with computers.

Table-5.5 Working experience with computers

Sl.No.	Years	Frequency	Percent	Cumulative Percent
1	0	38	36.90	36.90
2	1-2	12	11.65	48.55
3	3-4	36	34.95	83.50
4	5-6	9	8.74	92.24
5	7-8	5	4.85	97.09
6	9-10	1	0.97	98.06
7	11-12	1	0.97	99.03
8	13-14	1	0.97	100.00
Total		103	100.00	

From the table shown above, it can be observed that in terms of level of experience with computers, 46.60% of the respondents have computer experience ranging from 1-4 years, clearly indicating that almost half of the respondents do not have much working experience with computers. Only 16.23% of the respondents have more than 5 years of experience with computers on the job while 36.90% have no experience with computers at all.

5.2 INTERCORRELATION AMONG SOCIO-ECONOMIC VARIABLES

In order to find the relationship between the socio-economic variables, Pearson's coefficient of correlation was computed among the socio-economic variables. Table-5.6 displays the intercorrelation among the socio-economic variables.

Table-5.6 Intercorrelation among socio-economic variables

Sl.No.	Socio-economic Variables	1	2	3	4	5	6	7
1	Age	X	—	—	—	—	—	—
2	Designation	0.468**	X	—	—	—	—	—
3	Professional qualifications	0.089	0.440**	X	—	—	—	—
4	Academic qualifications	0.220*	0.292**	0.107	X	—	—	—
5	Working experience in the present library	0.775**	0.348**	-0.043	0.094	X	—	—
6	Overall working experience	0.849**	0.493**	0.126	0.204*	0.871**	X	—
7	Working experience with computers	-0.052	0.050	0.158	0.239*	-0.082	-0.013	X

Note: $n = 103$, * $P = < .01$ and ** $P = < .005$

The above table shows that age is positively correlated with working experience in the present library ($r=0.775$) and overall working experience in libraries ($r=0.849$). This shows that higher the age, higher is the working experience in the present library as well as overall working experience. Designation has significant positive correlations with professional qualifications ($r=0.440$) and academic qualifications ($r=0.292$). This shows that Librarians and Deputy Librarians have higher qualifications as compared to Assistant

Librarians and below. Working experience with computers also has a significant positive correlation with academic qualification ($r=0.239$). This indicates that library professionals having higher qualifications have a good working experience with computers.

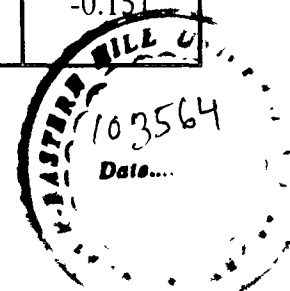
5.3 CORRELATION BETWEEN SOCIO-ECONOMIC VARIABLES AND ATTITUDES TOWARDS INFORMATION TECHNOLOGY

In order to study the pattern of relationship between attitudes towards information technology and socio-economic variables, Pearson's coefficient of correlation was computed between the attitudes towards information technology and socio-economic variables. The result of the correlation is given in Table-5.7

Table -5.7 Correlations between socio-economic variables and attitudes towards Information Technology

Sl.No	Socio-economic variables	Attitude towards Information Technology				
		Anxiety	Efficiency	Work Performance	Use Confidence	Acceptance
1	Age	0.042	-0.026	-0.040	0.063	0.024
2	Designation	-0.135	-0.077	-0.157	-0.168	-0.158
3	Professional qualifications	-0.068	0.131	0.088	-0.125	-0.029
4	Academic qualifications	-0.132	-0.076	-0.082	-0.093	-0.078
5	Working experience in the present library	0.018	-0.047	-0.042	-0.043	-0.001
6	Overall working experience in libraries	0.032	0.002	-0.025	-0.041	-0.029
7	Working experience with computers	-0.332**	-0.125	0.194*	-0.154	-0.151

Note: $n = 103$, * $P < .01$ and ** $P < .005$



It can be observed from the table presented above that most of the socio-economic variables are not significantly correlated with attitudes towards information technology. It is clear that working experience is positively correlated work performance ($r = 0.194$). This shows that library professionals who have more work experience with computers show higher work performance. Further, working experience with computers is negatively correlated with Anxiety ($r = -0.332$) which indicates that lower the working experience with computers, higher the anxiety among library professionals. From this, it can be inferred that library professionals who have low working experience with computers have very high levels of anxiety towards information technology.

5.4 INFORMATION SCIENCE COURSES

In order to ascertain the different types of information science courses taken by the respondents, the courses were divided into nine categories. These categories were based on two studies (Yoo, 1988 and Fosdick, 1978). Fosdick identified 6 categories and later on Yoo added 3 more categories. These are enumerated as follows:

1. Introduction to information technology
2. Computer application in libraries
3. Library automation
4. Information storage and retrieval
5. System analysis
6. Online retrieval
7. Networking

8. Programming
9. Indexing/abstracting

The respondents were asked to identify whether they had taken these courses during their formal professional qualification. In addition to this, another category 'any others' was added to identify other courses besides information science courses that were not covered by the category mentioned earlier.

Table-5.8 shows the description of information science courses taken by the respondents.

Table-5.8 Information science courses taken by the respondents

Sl.No.	Name of the Courses	Frequency	Percent
1	Introduction to Information technology	83*	80.58
2	Computer application in libraries	81*	78.64
3	Library automation	62*	60.19
4	Information storage and retrieval	71*	68.93
5	System analysis	63*	61.16
6	Online retrieval	15*	14.56
7	Networking	21*	20.38
8	Programming	15*	14.56
9	Indexing/abstracting	25*	24.27
10	Any Others	15*	14.56

Note in each case, n=103*

It is clearly evident from the table given above that the most frequently taken course is 'Introduction to Information technology' and the least taken course is 'Online Retrieval' and 'Programming'. There are 83 respondents (80.58%) who have taken

'Introduction to Information Technology' and 81 respondents (78.64%) who have attended 'Computer Application to Libraries'. 71 respondents (68.93%) have taken 'Information Storage and Retrieval'. Only 15 respondents (14.56%) said that they have taken course in 'Programming'. The last item 'others' in the questionnaire shows that 9 of the respondents (8.73%) have taken 'Certificate course in computers application' and 6 of the respondents (5.82%) have taken 'Certificate course in library software application'.

5.5 IN-SERVICE TRAINING

Table-5.9 shows the in-service training attended by the respondents.

Table-5.9 In-service training attended by the respondents

Sl.No.	Name of the Courses	Frequency	Percent
1	Workshop	53*	51.45
2	Continuing education course	20*	19.41
3	Refresher course	23*	22.33

Note in each case, n=103*

The table presented above clearly shows that about half of the respondents (51.45%) have attended workshop, 20 (19.41%) have attended continuing education course and 23 respondents (22.33%) have attended refresher course. The overall picture indicates that attending in-service training is not widespread among the library professionals.

5.6 IN-SERVICE TRAINING: SPONSORSHIP

The sponsoring agencies of in-service training are shown in Table-5.10

Table-5.10 Sponsoring agencies of in-service training

Sl.No.	Agency	Frequency	Percent
1	NISSAT	12*	11.65
2	IASLIC	6*	5.82
3	INSDOC	13*	12.62
4	DRTC	3*	2.91
5	UGC	24*	23.30
6	ICSSR	2*	1.94
7	INFLIBNET	9*	8.73
8	Others	9*	8.73

Note in each case, n=103*

From the table given above, it shows that 24 respondents (23.30%) have attended in-service training sponsored by the UGC, while 13 respondents (12.62) have attended courses sponsored by INSDOC and 12 respondents (11.65%) sponsored by NISSAT. 9 respondents (8.73%) have attended courses sponsored by the INFLIBNET and 9 respondents (8.73%) have attended courses sponsored by agencies such as IIT, DOE, NIC and GIST which is represented in the section labeled 'others'.

5.7 DURATION OF INSTALLATION OF COMPUTERS IN LIBRARIES

Table-5.11 shows the duration of installation of computers in libraries.

Table-5.11 Duration of installation of computers in libraries

Sl.No.	Years	Frequency	Percent	Cumulative Percent
1	0	30	29.13	29.13
2	1-2	8	7.77	36.90
3	3-4	38	36.90	73.80
4	5-6	16	15.53	89.33
5	7-8	3	2.91	92.24
6	9-10	1	0.97	93.21
7	11-12	2	1.94	95.15
8	13-14	5	4.85	100.00
Total		103	100.00	

The table above shows that a very high percentage of the respondents are working in libraries which have computers installed. A total of 73 library professionals (70.87%) stated that they have computers in the library, while only 30 (29.13%) stated that no computers are installed in their library. This implies that majority of library professionals have access to computers in their library. 46 respondents (44.67%) stated that the computers had been installed in their library within the last 4 years. The result also shows that 11 respondents (10.13%) are working in libraries where computers have been installed more than 6 years ago. Only 8 respondents (7.77%) were working in libraries which had computers installed within the last 2 years.

5.8 TYPES OF LIBRARY SOFTWARES USED

Table-5.12 shows the library softwares used.

Table-5.12 Library softwares used

Sl.No.	Software/Database	Frequency	Percent	Cumulative Percent
1	No Library Software	33	32.04	32.04
2	CDS/ISIS	40	38.84	70.88
3	LIBSYS	23	22.33	93.21
4	SOUL	6	5.83	98.74
5	ORACLE	1	0.97	99.71
Total		103	99.71	

On observing the data on the types of library software/database used by the respondents in their library, 40 respondents (38.84%) are using CDS/ISIS and 23 respondents (22.33%) have LIBSYS. 6 respondents (5.83%) are using SOUL and 1 respondent has ORACLE-library management system. 32.04% of the respondents do not use any library software.

5.9 CONCLUSION

The analysis of socio-economic variables shows that more than half of the respondents are up to the age of 40 and majority of the respondents are male. Majority of the respondents are working as Professional Assistants or Semi Professional Assistants and majority of the library professionals have master degree in Library and Information Science. It is also observed that majority of library professionals have been working in the present library up to 12 years and only 16.23% of the respondents have more than 5

years of working experience with computers. The types of library software used were mostly CDS/ISIS.

The intercorrelation among socio-economic variables shows that library professionals of higher age have higher working experience in libraries and those of higher designation have higher qualifications. It also shows that library professionals having higher qualifications have a good working experience with computers. It is further observed that library professionals who have more work experience with computers show higher work performance and lower levels of anxiety towards information technology.

CHAPTER – 6

TESTING OF HYPOTHESES

6.0 INTRODUCTION

In Chapter 4, the 5 factors of attitudes towards information technology have been identified. These are Anxiety, Efficiency, Work Performance, Use Confidence, and Acceptance. Chapter 5 discusses in detail the socio-economic variables and information science courses taken by the respondents. The socio-economic variables identified are age, sex, designation, professional qualifications, academic qualifications, working experience in the present library and overall working experience in libraries. Besides these, working experience with computers and duration of installation of computers in the library is also discussed in Chapter 5. The information science courses taken by the respondents are Introduction to information technology, Computer application in libraries, Library automation, Information storage and retrieval, System analysis, Online retrieval, Networking, Programming and Indexing/abstracting.

6.1 HYPOTHESIS –I

In order to test hypotheses-I of the study, ANOVA has been computed between socio-economic variables and attitudes towards information technology and results of the ANOVA are presented in Table 6.1.

**Table -6.1 Socio-economic variables and attitude towards information technology:
Hypothesis -I (ANOVA)**

Sl. No.	Socio-economic variables	Attitude towards Information technology					df	
		Anxiety	Efficiency	Work Performance	Use Confidence	Acceptance		
1	Age	<i>f</i>	0.927	0.781	1.046	0.913	0.827	6/96 (2.1750) [#]
		<i>Sig</i>	0.479	0.587	0.400	0.489	0.552	
2	Sex	<i>f</i>	0.616	0.377	2.084	4.037	0.480	1/101 (3.9201) [#]
		<i>Sig</i>	0.434	0.541	0.152	0.047	0.490	
3	Designation	<i>f</i>	1.148	1.488	2.240	1.136	1.894	4/98 (2.4472) [#]
		<i>Sig</i>	0.339	0.212	0.070	0.344	0.118	
4	Professional qualifications	<i>f</i>	1.197	0.894	0.743	0.816	0.316	2/100 (3.0718) [#]
		<i>Sig</i>	0.307	0.412	0.478	0.445	0.730	
5	Academic qualifications	<i>f</i>	0.888	0.519	0.401	0.509	0.491	2/100 (3.0718) [#]
		<i>Sig</i>	0.415	0.597	0.671	0.603	0.614	
6	Working Experience in the present library	<i>f</i>	1.483	1.188	0.977	1.482	0.995	8/94 (2.0164) [#]
		<i>Sig</i>	0.174	0.315	0.459	0.174	0.445	
7	Overall working experience	<i>f</i>	1.998	0.625	0.911	0.627	0.568	8/94 (2.0164) [#]
		<i>Sig</i>	0.055	0.755	0.511	0.753	0.801	

* $P < 05$, Bold marking = Calculated value, # = Tabulated value

From the table shown above, it is observed that most of the socio-economic variables do not show any significance with attitude towards information technology. Age, designation, professional qualification, academic qualification and working experience in the present library shows no significance with any components of attitudes towards information technology. In the case of sex, significance can be observed with use confidence ($f = 4.037$). This shows that there are variations between male and female library professionals in relation to use confidence. Overall working experience in libraries show significance with anxiety ($f = 1.998$). This implies that there are variations among

library professionals with different levels of overall working experience in relation to anxiety towards information technology. The remaining socio-economic variables do not show any significance with attitudes towards information technology, with the exception of sex and overall working experience in libraries where some variations are observed.

Fine (1979) reported that age, working experience and designation were important variables in determining attitude towards computers, but Luquire (1983) stated that age does not show any significance with attitude computers while designation was an important variable in determining attitude towards computers. Sievert et al. (1988) showed that age, educational qualification and working experience influences attitude towards computers but designation does not have any significance in determining attitude towards computers and computer anxiety. In the same line, DuMont and DuMont (1989) concluded that designation shows no significance in determining attitude towards computers. Lee (1989) reported that attitude towards computers is influenced by educational qualification and working experience in the library whereas Su (1993) showed that working experience does not influence attitude towards computers but designation was an important variable in determining attitude towards computers and technology. Al-Zahrani (2000) reported that attitude towards Information technology is influenced by educational qualification.

From the above studies it becomes difficult to arrive at a conclusion as all the studies report contradictory results. However, it is clear that some socio-economic

variables do influence attitudes towards information technology. The present analysis shows that only sex and working experience makes a little difference as far as attitudes towards information technology is concerned. Therefore, drawing conclusions from the above analysis, the first hypothesis of the study;

H₁. *Attitudes of library professionals towards information technology will differ on the basis of socio-economic variables, is only partially accepted.*

6.2 HYPOTHESIS-II

In order to test hypotheses-II of the study, ANOVA has been computed between computer experience and attitudes towards information technology. The results of the ANOVA are shown in Table-6.2.

Table -6.2 Experience on computers and attitude towards Information technology: Hypothesis -II (ANOVA)

Sl. No.	Experience on computers		Attitude towards Information technology					df
			Anxiety	Efficiency	Work Performance	Use Confidence	Acceptance	
1	Experience with computers	<i>f</i>	3.887	1.110	1.023	0.979	2.322	7/95 (2.0867) [#]
		<i>Sig</i>	0.001	0.363	0.420	0.451	0.031	
2	Duration of installation of computers in the library	<i>f</i>	3.734	2.215	2.564	1.005	3.111	7/95 (3.9201) [#]
		<i>Sig</i>	0.001	0.040	0.018	0.433	0.005	

* $P < .05$, Bold marking = Calculated significant value, # = Tabulated value

From the table above, it is observed that computer experience shows variations with attitudes towards information technology. Experience with computers shows significance with

acceptance ($f= 2.322$) and high significance with anxiety ($f= 3.887$). This implies that there are variations among library professionals with computer experience in relation to acceptance of information technology and anxiety towards information technology. Installation of computers in the library is significant with anxiety ($f= 3.734$), efficiency ($f= 2.215$), work performance ($f= 2.564$) and acceptance ($f= 3.11$). This indicates that there are variations among library professionals who have computers installed in the libraries in relation to anxiety, efficiency, work performance and acceptance respectively.

In order to ascertain the ranking order of library professionals' attitudes towards information technology in relation to experience with computers, the mean value of each case was calculated and ranked as shown in Table-6.3.

Table-6.3 Attitudes towards and information technology and experience with computers: rank

Sl. No.	Attitude towards information technology	No experience	Experience with computers (years)							
			1-2	3-4	5-6	7-8	9-10	11-12	13-14	
1	Anxiety	Mean	50.57	45.25	47.66	40.55	40.80	45.00	45.00	48.00
		Rank	1	4	3	7	6	5	5	2
2	Efficiency	Mean	29.44	27.08	28.41	28.33	26.20	41.00	22.00	18.00
		Rank	2	5	3	4	6	1	7	8
3	Work performance	Mean	17.68	15.25	16.66	16.11	14.20	17.00	16.00	11.00
		Rank	1	6	3	4	7	2	5	8
4	Use confidence	Mean	8.55	8.08	8.86	7.77	7.40	8.00	6.00	6.00
		Rank	2	3	1	5	6	4	7	7
5	Acceptance	Mean	5.71	4.66	5.30	4.33	4.20	5.00	8.00	5.00
		Rank	2	5	3	6	7	4	1	4

From the table given above, it is clearly observed that library professionals without any experience with computers show high level of anxiety towards information technology and also higher level of work performance. Whereas, library professionals who have experience with computers ranging between 9-10 years consider information technology to be highly efficient and those who have experience between 3-4 years show higher use confidence towards information technology. It can also be seen that library professionals who have experience with computers ranging between 11-12 years show more acceptance towards information technology.

In order to determine ranking order of library professionals' attitudes towards information technology in relation to duration of installation of computers in the library, the mean value of each case was calculated and ranked as shown in Table-6.4.

Table-6.4 Attitudes towards information technology and duration of installation of computers in the library: rank

Sl. No.	Attitude towards information technology	Not installed	Duration of installation of computers in the library (years)							
			1-2	3-4	5-6	7-8	9-10	11-12	13-14	
1	Anxiety	Mean	51.50	41.12	47.34	44.37	47.66	40.00	43.00	47.20
		Rank	1	7	3	5	2	8	6	4
2	Efficiency	Mean	30.23	23.75	28.47	25.37	29.33	26.00	40.00	31.00
		Rank	3	8	5	7	4	6	1	2
3	Work performance	Mean	17.30	13.00	16.65	15.56	15.00	23.00	22.50	19.40
		Rank	4	8	5	6	7	1	2	3
4	Use confidence	Mean	8.66	7.25	8.73	7.81	7.33	10.0	8.00	9.00
		Rank	4	8	3	6	7	1	5	2
5	Acceptance	Mean	5.86	4.12	5.21	4.68	4.00	6.00	4.50	6.60
		Rank	3	7	4	5	8	2	6	1

From the above table, it is clearly evident that library professionals working in libraries without any computers show a high level of anxiety towards information technology. However, library professionals working in libraries with computers installed 11-12 earlier find information technology to be highly efficient and those working in libraries with computers installed 9-10 years earlier have higher level of work performance. It is also observed that library professionals working in libraries with computers installed 9-10 years earlier show higher use confidence in information technology while those with computers installed 13-14 earlier shows high level of acceptance towards information technology.

Many studies also have reported similar results that experience with computers results in positive attitudes towards information technology, (Fine, 1979; Yaghmai, 1981; Weeks, 1982; Sievert et al., 1988 and Al-Zahrani, 2000). Whereas (Luquire, 1983 and Yoo, 1988) stated that experience with computers do not influence attitudes towards information technology.

The findings of the present study show that experience with computers definitely influences attitudes towards information technology and that, there is positive attitudes towards information technology among library professionals who have higher working experience with computers. Therefore, on the basis of the analysis and discussions, the second hypothesis of the study;

H₂. Library professionals with experience on computers will show positive attitudes towards information technology as compared to library professionals without experience on computers, is accepted.

n = 103

6.3 HYPOTHESIS-III

In order to test hypothesis-III of the study, Pearson's coefficient of correlation had been computed between attitudes towards information technology and information science courses along with in-service training. The results of the test are presented in Table-6.5.

Table -6.5 Correlations between information science courses and attitudes towards Information Technology: Hypothesis-III

Sl.No	Information Science Courses	Attitude towards Information technology				
		Anxiety	Efficiency	Work Performance	Use Confidence	Acceptance
1	Introduction to information technology	-0.120	-0.098	-0.012	-0.029	0.054
2	Computer application in libraries	-0.241*	-0.051	-0.071	0.215*	0.238*
3	Library automation	-0.156	-0.162	0.027	-0.148	-0.044
4	Information storage and retrieval	-0.062	-0.054	0.073	-0.115	-0.079
5	System analysis	-0.112	-0.108	0.047	-0.105	-0.034
6	Online retrieval	-0.067	-0.036	0.021	-0.098	-0.073
7	Networking	-0.166	-0.062	0.048	-0.139	-0.187
8	Programming	-0.051	0.026	-0.044	-0.085	-0.147
9	Indexing/abstracting	-0.154	-0.104	-0.009	-0.053	0.060
10	Certificate course in computer application	-0.010	0.071	-0.048	0.036	-0.032
11	Certificate course in library software application	-0.106	-0.017	0.216*	-0.111	-0.184
12	In-service training	-0.239*	0.025	0.109	0.139	0.271**

Note: n = 103, *P = < .01 and **P = < .005

From the table given above, it can be observed that attitudes towards information technology is not highly correlating with information science courses except in a few cases. Computer application in libraries is negatively correlated with anxiety ($r = -0.241$). However, it is positively correlated with use confidence ($r = 0.215$) and acceptance ($r = 0.238$). From this, it can be implied that library professionals who have not attended course in computer application in libraries have high levels of anxiety towards information technology. Whereas, library professionals who have attended course in computer application in libraries accept information technology more readily and have more confidence in using them. It is also seen that certificate course in library software application shows positive correlation with work performance ($r = 0.216$). This indicates that library professionals who have an additional degree of certificate course in library software application show higher work performance. In-service training shows negative correlation with anxiety whereas it shows positively correlation with acceptance. This implies that library professionals who have not attended in-service training have anxiety towards information technology however, those who have attended in-service training show positive acceptance of information technology.

Drawing conclusions from the analysis above, the third hypothesis of the study;

H₃. *There is no relationship between attitudes towards information technology and information science courses taken by library professionals is partially accepted.*

6.4 CONCLUSION

The ANOVA between socio-economic variables and attitudes towards information technology shows that most of the socio-economic variables does not show any significance with attitudes towards information technology except in the case of sex and overall working experience in libraries, where some variations is observed between male and female library professionals in relation to use confidence and are variations among library professionals with different levels of overall working experience in relation to anxiety towards information technology. The first hypothesis of the study is partially accepted.

The ANOVA between computer experience and attitudes towards information technology shows variations in majority of the cases. There are variations among library professionals with computer experience in relation to acceptance of information technology and anxiety towards information technology and variations among library professionals who have computers installed in the libraries in relation to anxiety, efficiency, work performance and acceptance respectively. Library professionals without any experience with computers show high level of anxiety towards information technology and also higher level of work performance. Whereas, library professionals who have experience with computers ranging between 9-10 years consider information technology to be highly efficient and those who have experience between 3-4 years show higher use confidence towards information technology. It is also observed that library

professionals who have experience with computers ranging between 11-12 years show more acceptance towards information technology. Library professionals working in libraries without any computers show a high level of anxiety towards information technology. However, library professionals working in libraries with computers installed 11-12 earlier find information technology to be highly efficient and those working in libraries with computers installed 9-10 years earlier have higher level of work performance. It is also observed that library professionals working in libraries with computers installed 9-10 years earlier show higher use confidence in information technology while those with computers installed 13-14 earlier shows high level of acceptance towards information technology. The second hypothesis of the study is totally accepted.

Correlations between attitudes towards information technology and information science courses shows low significance except in a few cases. Library professionals who have not attended course in computer application in libraries have high levels of anxiety towards information technology. Whereas, library professionals who have attended course in computer application in libraries accept information technology more readily and have more confidence in using them. Library professionals who have an additional degree of certificate course in library software application show higher work performance. In-service training shows negative correlation with anxiety whereas it shows positively correlation with acceptance. This implies that library professionals who

have not attended in-service training have anxiety towards information technology however, those who have attended in-service training show positive acceptance of information technology. The third hypothesis of the study is also partially accepted.

CHAPTER – 7

CONCLUSION AND SUGGESTIONS

7.0 INTRODUCTION

The advances in information technology have been fast invading in all spheres of human endeavours and libraries are not exempted. In fact, libraries today have become increasingly vulnerable to this technological invasion. Yet the library professionals are still unable to gear up themselves for this fast and inevitable changes brought about by the technological advancements. Further, it is quite obvious that the institutions engaged in imparting education and training in librarianship, particularly in India, are still lagging behind in producing the professionals who would be able to cope up with this changing environment. In India, there has been a very few studies carried out along this line, and no studies have been attempted in North East India. It is, therefore, against this backdrop that the present study has been conducted as an attempt to investigate the attitudes of library professionals towards information technology and its relationship with library and information science education. The findings of the study have been summarised as below:

7.1 SUMMARY OF THE FINDINGS

Initial factor analysis of 'Attitudes towards Computers' resulted in 5 factors namely, 'Anxiety, Efficiency, Work performance, Use confidence and Acceptance'. Further factor analysis of 'Attitudes towards Information Technology' resulted in 3 factors namely, 'Efficiency, Work performance and Anxiety'. On further observation, it was seen that the factors were overlapping and similar because there is marginal

difference between computers and information technology. So, for the purpose of better result, 'Attitudes towards Computers' and 'Attitudes towards Information Technology' were merged together and factorized. This resulted in the identification of the following 10 factors: Efficiency-1, Work Performance, Use Confidence, Efficiency-2, Anxiety-1, Anxiety-2, Anxiety-3, Anxiety-4, Acceptance and Anxiety-5.

Since there was overlapping among the factors, for better analysis, similar factors were merged and five final factors were retained for further analysis as shows below:

1. Anxiety
2. Efficiency
3. Work Performance
4. Use Confidence
5. Acceptance.

The mean score of the factors show that Anxiety ranks first followed by Efficiency. Work performance is ranked as the third factor which is followed by Use confidence. Acceptance is ranked as the last factor.

The descriptive analysis of the socio-economic variables shows that there are no respondents below 25 years of age and more than half of the respondents (55.35%) are up to the age of 40. This clearly shows that majority of the respondents are young. It is also observed that majority of the respondents are male (56.31%) and a clear majority of the

respondents are working as Professional Assistants or Semi Professional Assistants (61.17%). Majority of the library professionals (64.08%) have master degree in Library and Information Science. 29 professionals (28.15%) have bachelor degree and only 8 respondents (7.77) have doctoral degree in Library and Information Science. It is also observed that only 27 respondents (26.21%) have an additional master degree other than Library and Information Science and only 1 respondent have a doctoral degree in a subject other than Library and Information Science. Majority of library professionals have been working in the present library up to 12 years (55.34%). There seem few library professionals who have put in more than 25 years of experience and above. This shows that majority of the library professionals are younger (below 40 years), Respondents (30.10%) indicates up to 4 years of experience in the present library and 46.60% of the respondents have computer experience ranging from 1-4 years, clearly indicating that almost half of the respondents do not have much working experience with computers. Only 16.23% of the respondents have more than 5 years of experience with computers on the job while 36.90% have no experience with computers at all.

The intercorrelation among socio-economic variables shows that library professionals of higher age group have higher working experience in the present library as well as higher overall working experience. Library professionals of higher designation have higher qualifications and those with higher qualifications have a good working experience with computers.

The correlation between socio-economic variables and attitudes towards information technology shows that most of the socio-economic variables are not significantly correlated with attitudes towards information technology. Library professionals who have more work experience with computers show higher work performance while those who have low working experience with computers have very high levels of anxiety towards information technology.

The descriptive analysis of the information science courses shows the most frequently taken course is 'Introduction to Information technology' and the least taken course is 'Online Retrieval' and 'Programming'. Very few respondents have attended certificate course in computers application and certificate course in library software application.

It is also observed that attending in-service training is not widespread among the library professionals. About half of the respondents (51.45%) have attended workshop, 20 (19.41%) have attended continuing education course and 23 respondents (22.33%) have attended refresher course.

A majority of library professionals have access to computers in their library. A total of 73 library professionals (70.87%) stated that they have computers in the library, while only 30 (29.13%) stated that they had none.

40 respondents (38.84%) are using CDS/ISIS and 23 respondents (22.33%) have LIBSYS. 6 respondents (5.83%) are using SOUL and 1 respondent has ORACLE-library management system. 32.04% of the respondents do not use any library software.

The ANOVA between socio-economic variables and attitudes towards information technology shows that most of the socio-economic variables do not have any significance with attitude towards information technology. Except in the case where variations can be observed between male and female library professionals in relation to use confidence of information technology and with different levels of overall working experience in relation to anxiety towards information technology. Therefore, drawing conclusions from the analysis, the first hypothesis of the study is only partially accepted.

The ANOVA between working experience with computers and attitudes towards information technology shows that computer experience shows variations with attitudes towards information technology. There are variations among library professionals with experience on computers in relation to acceptance of information technology and anxiety towards information technology and also variations among library professionals who have computers installed in the libraries in relation to anxiety, efficiency, work performance and acceptance respectively.

It is also observed that library professionals without any experience with computers show high level of anxiety towards information technology and also higher level of work performance. Whereas, library professionals who have experience with computers ranging between 9-10 years consider information technology to be highly efficient and those who have experience between 3-4 years show higher use confidence towards information technology. It can also be seen that library professionals who have experience with computers ranging between 11-12 years show more acceptance towards information technology. Moreover, library professionals working in libraries without any computers show a high level of anxiety towards information technology, Whereas, library professionals working in libraries with computers installed 11-12 earlier find information technology to be highly efficient and those working in libraries with computers installed 9-10 years earlier have higher level of work performance. It is also observed that library professionals working in libraries with computers installed 9-10 years earlier show higher use confidence in information technology while those with computers installed 13-14 years earlier shows high level of acceptance towards information technology. These findings show that experience with computers definitely influences attitudes towards information technology and that, there is positive attitude towards information technology among library professionals who have higher working experience with computers. Therefore, on the basis of the analysis and discussions, the second hypothesis of the study is totally accepted.

The correlation between information science courses and attitudes towards information technology shows that library professionals who have not attended course in computer application in libraries have high levels of anxiety towards information technology, ^wWhereas, library professionals who have attended course in computer application in libraries accept information technology more readily and have more confidence in using them. Library professionals who have an additional degree of certificate course in library software application show higher work performance. Library professionals who have not attended in-service training have anxiety towards information technology. ^HHowever, those who have attended in-service training show positive acceptance of information technology. Drawing conclusions from the analysis above, the third hypothesis of the study is partially accepted.

7.2 SUGGESTIONS

The findings from the present study show that there are high levels of anxiety towards information technology among the library professionals. Anxiety ^{occurs} due to changes in the workplace, health anxiety, inexperience or lack of knowledge on information technology, job insecurity/displacement, ^{and worry about} being worried of additional workload and responsibility. All these anxieties show that there is general ignorance about information technology among the library professionals. Such feelings should be removed through awareness programs on information technology. They should be constantly encouraged and motivated to make use of the information technology facilities.

It has also been observed that library professionals have not been given the opportunity to attend in-service training and continuing education programs^{me} in information technology. Top priority should be given to the^{the} library professionals so as to equip them with the latest knowledge on information technology. It may also be suggested that those^{the} library professionals in the non-supervisory positions should also be motivated to attend such trainings^{the}. This is due to the fact that these individuals are the ones who are actually involved in the routine aspects of the application of information technology in libraries. Moreover, there should be enough time for the library professionals in order to absorb and practice after the training

Adequate information technology infrastructure should be made available for the trained library professionals in order to put their knowledge on information technology into practice.

Many libraries may have computers but it has been observed that low priority is given to the acquisition and usage of library software. Library softwares^{the} such as CDS/ISIS, LIBSYS and SOUL may be ideal for the purpose.

or what basis such cannot be seen, the /

It is further suggested that library professionals should be encouraged to obtain an additional certificate degree or even higher degree in library software application.

7.3 SUGGESTIONS FOR FURTHER RESEARCH

This study was exploratory in nature since there was no previous research that studied the relationship between library professionals' attitudes towards information technology and their background in information science courses. Since many research and academic libraries in the North East India are yet to be automated, it may be that library professionals who were surveyed may have little or no knowledge of information technology at all, hence the resulting attitudes towards Information Technology may be biased. Moreover, a study with a truly random sample may have presented a more realistic picture of the library professionals' attitudes towards information technology.

This research did not study a way to find out whether there was an attitude change between, before, ^{or} or after their information science courses. These factors could be taken up for further research in the future. Also, it may be noted that attitude is a very complex variable and it may be associated with other demographic variables such as personality which was not included in the study. Attitude may also be related to specific experiences with information technology, or the means of instruction in information science courses. For a better understanding of the underlying relations and dimensions of attitudes towards information technology, a more extensive study using the above mentioned variables may be necessary.

7.4 DRAWBACKS OF THE STUDY

The present study was conducted in the North-East India. A total of 22 academic and research libraries have 163 professional staff working in them amounting to the ratio of 7:1 professionals in each library. Out of 163 professionals, only 103 responded after making three requests (response rate 63.19%). The findings based on such a small sample need to be tested again on a larger population before arriving at the basic conclusion. The study could not survey a large population due to time limitations. Further, the results of factor analysis may change on a larger population.

Do the attitudes of academic library professionals towards information technology differ from the library professionals working in research libraries? This question could not be answered. The comparative study between the two could have made the study more interesting but this was not possible due to small number of respondents. All the research libraries in North-East India were not taken into account because they lacked the application of information technology components in their libraries.

Moreover, this study is one time frame study and attitudes can be well understood if measured in multiple time frame studies.

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ANNEXURE

Annexure-I
List of Institutions initially compiled

1. Arunachal University, Itanagar
2. Assam Agricultural University, Guwahati
3. Assam Agricultural University, Jorhat
4. Assam Government Homeopathic Medical College and Hospital, Nagaon
5. Assam Institute of Research for Tribal and Social Change, Guwahati
6. Assam Medical college, Dibrugarh
7. Assam University, Silchar
8. Botanical Survey of India, Itanagar
9. Botanical Survey of India, Shillong
10. Central Agricultural University, Imphal
11. Central Institute of Hindi, Guwahati
12. Dibrugarh University, Dibrugarh
13. Guwahati Medical College, Guwahati
14. Gauhati University, Guwahati
15. ICAR Research Complex for NEH Region, Barapani
16. ICAR Research Complex for NEH Region, Tura
17. Indian Institute of Entrepreneurship, Guwahati
18. Indian Institute of Technology, Guwahati
19. Institute of Environmental Science, Guwahati
20. Law Research Institute, Guwahati
21. Manipur University, Imphal
22. Nagaland University, Kohima
23. Nagaland University, Lumami
24. Nagaland University, Medziphema
25. National Institute of Rural Development, Guwahati
26. National Research Centre for Yak, Nikmadung
27. National Research Centre on Mithun, Medziphema
28. North East Institute of Bank Management, Guwahati
29. North Eastern Hill University, Aizawl
30. North Eastern Hill University, Shillong
31. North Eastern Hill University, Tura
32. North Eastern Regional Institute of Science & Technology, Itanagar
33. Ramie Research Station, Barpeta
34. Regional Engineering College, Silchar
35. Regional Institute of Medical Sciences, Imphal,
36. Regional Medical Research Centre (RMRC-D), Dibrugarh
37. Regional Research Laboratory (RRL-JT), Jorhat
38. Regional Sericultural Research Station (RSRS), Titabar
39. Silchar Medical College, Silchar
40. Tezpur University, Tezpur
41. Toklai Experimental Station, Jorhat
42. Tribal Research Institute, Guwahati
43. Tripura University, Agartala

Annexure-II

Date: _____

To,

The Librarian,

Sir/Madam,

With due respect, I would like to inform you that I am a research scholar from the Department of Library and Information Science, NEHU, Shillong. I am working on the topic, "Attitudes of Academic and Research Library Professionals towards Information Technology and its relationship with Information Science Courses in India". My research topic covers academic and research libraries in North-East India. I, therefore request you to kindly fill up the form given on the next page stating the total professional staff of your library. Kindly send the completed form through the self-addressed stamped envelop enclosed at your earliest convenience.

Thanking you.

Yours sincerely,

(T.Temjen)

Research Scholar,

Department of Library and Information
Science, NEHU, Shillong, Meghalaya.

Name of the University/Research Institution:

1. Librarian _____ person/s
2. Deputy Librarian _____ person/s
3. Assistant Librarian _____ person/s
4. Documentation Officer _____ person/s
5. Information Scientist _____ person/s
6. Senior Professional Assistant _____ person/s
7. Junior Professional Assistant _____ person/s
8. Others:
 - i. _____ person/s
 - ii. _____ person/s
 - iii. _____ person/s
 - iv. _____ person/s

Annexure-III
SECTION - I
(Attitudes towards computers)

Given below are 39 statements requiring you to express your opinion. This is not to be graded so **Please do not omit any item.** Please encircle the letter or letters which represent your own ideas about each statement.

The following abbreviations are used to express your opinion:

SA - Strongly Agree

A - Agree

U - Undecided

D - Disagree

SD - Strongly Disagree

- | | | | | | |
|--|----|---|---|---|----|
| 1 I would like to use a computer | SA | A | U | D | SD |
| 2 Computers can simplify complex problems | SA | A | U | D | SD |
| 3 Computer helps to solve problems faster | SA | A | U | D | SD |
| 4 Computers would be helpful in my line of work | SA | A | U | D | SD |
| 5 I would like computers to accept the jargons of my profession | SA | A | U | D | SD |
| 6 Machine response time of computers are very slow | SA | A | U | D | SD |
| 7 Information produced by computers are too detailed | SA | A | U | D | SD |
| 8 I enjoy learning a new computer programme | SA | A | U | D | SD |
| 9 I would enjoy learning about the basics of computers and their abilities | SA | A | U | D | SD |
| 10 Society relies too heavily on computers | SA | A | U | D | SD |
| 11 Computers are a great boon to humanity | SA | A | U | D | SD |
| 12 The use of computers is a threat to the employee's position | SA | A | U | D | SD |
| 13 Information produced by computer is very accurate | SA | A | U | D | SD |
| 14 Information produced by computers is recent and timely | SA | A | U | D | SD |
| 15 Computers in library are very difficult to use | SA | A | U | D | SD |

16	Correction of errors in computers can be done easily and quickly	SA	A	U	D	SD
17	The utility of computers is highly limited	SA	A	U	D	SD
18	Computers might be useful but the results are not always encouraging	SA	A	U	D	SD
19	The use of computers goes against the interest of the employees and should not be encouraged	SA	A	U	D	SD
20	Libraries in India are not ready for computers and will not be ready for quite sometime	SA	A	U	D	SD
21	All libraries should make use of computers as far as possible	SA	A	U	D	SD
22	Computers have great uses in libraries because of its vast storage capacity	SA	A	U	D	SD
23	If judiciously used computers can be useful in several areas of the library	SA	A	U	D	SD
24	Computers does not supplant (substitute for) but supplement the library profession	SA	A	U	D	SD
25	Computers are too expensive for a library because of its limited budget	SA	A	U	D	SD
26	All libraries should make use of the computers for its development programmes	SA	A	U	D	SD
27	Computers are good for the library professionals but bad for the non-professionals	SA	A	U	D	SD
28	Computers are not useful in small libraries	SA	A	U	D	SD
29	The poor shape of academic and research libraries can be improved with judicious use of computers	SA	A	U	D	SD
30	It is difficult to have access to computer services in my library	SA	A	U	D	SD
31	The use of computers in my library have made my routine tasks more stimulating	SA	A	U	D	SD
32	Computers have great potential for use in library clerical operations	SA	A	U	D	SD

- | | | | | | |
|--|----|---|---|---|----|
| 33 I have been able to adapt to the changes brought upon by the addition of computers to my present workplace | SA | A | U | D | SD |
| 34 Noise in relation to computer operations, i.e., printing noise; UPS noise etc. can be disturbing to the library environment | SA | A | U | D | SD |
| 35 Computer training programmes conducted for library professionals should be formal | SA | A | U | D | SD |
| 36 The use of computers in the library and the effect on my position in the library is threatening | SA | A | U | D | SD |
| 37 The pace with which computers are introduced and accepted in the library is frightening | SA | A | U | D | SD |
| 38 Having computers in my workplace, I am more dedicated to the tasks that I have to perform | SA | A | U | D | SD |
| 39 I am motivated to work more efficiently | SA | A | U | D | SD |

SECTION - II
(Attitudes towards information technology)

Given below are 29 statements requiring you to express your opinion. This is not to be graded so **Please do not omit any item**. Please encircle the letter or letters, which represent your own ideas about each statement.

The following abbreviations are used to express your opinion:

SA - Strongly Agree

A - Agree

U - Undecided

D - Disagree

SD - Strongly Disagree

- | | | | | | | |
|---|---|----|---|---|---|----|
| 1 | The concept 'Library is a social institution' becomes meaningless with the application of information technology to libraries | SA | A | U | D | SD |
| 2 | Library professional will need adequate training/knowledge in information technology in order to implement information technology successfully to library | SA | A | U | D | SD |
| 3 | With the fast changing scenario of information technology, application of information technology would become obsolete the moment it has completed installation | SA | A | U | D | SD |
| 4 | Information technology has greatly improved the existing condition of library services | SA | A | U | D | SD |
| 5 | Information technology has enabled users to have greater access to more accurate information in the libraries | SA | A | U | D | SD |
| 6 | Resource sharing among different libraries has been greatly enhanced by application of information technology | SA | A | U | D | SD |

- | | | | | | | |
|----|---|----|---|---|---|----|
| 7 | Information technology has helped in saving the time of the users and library professional | SA | A | U | D | SD |
| 8 | Information technology has eliminated the dull, repetitive and routine work of the library professional | SA | A | U | D | SD |
| 9 | Information technology has enabled users to have information at a shorter span of time | SA | A | U | D | SD |
| 10 | Information search and retrieval (eg. catalogue search) has become easy and fast because of Information technology in the libraries | SA | A | U | D | SD |
| 11 | Library professional have become more efficient in their work and their performances have greatly improved because of the application of information technology | SA | A | U | D | SD |
| 12 | Library professionals are now more satisfied with their job on account of information technology | SA | A | U | D | SD |
| 13 | The introduction of information technology to libraries have paved the way for library professionals to provide efficient information services | SA | A | U | D | SD |
| 14 | Library professionals not skilled in information technology have lost their job, position, or displaced because of the influx of the new professionals (skilled in information technology) to libraries | SA | A | U | D | SD |
| 15 | Library professionals are apprehensive about the effect of information technology on their health, i.e., monitor radiation, eye strain, body posture, backache, stress on the fingers etc. | SA | A | U | D | SD |
| 16 | Library professionals feel the their professional status has been enhanced because of information technology in their workplace | SA | A | U | D | SD |
| 17 | A library having information technology facilities generates more interest and encourages more users | SA | A | U | D | SD |
| 18 | A library having information technology facilities is considered more prestigious than a library without information technology | SA | A | U | D | SD |
| 19 | Information technology has improves the decision making process of the management and hence more efficient library management | SA | A | U | D | SD |

20	Information technology leaves no incentive for the progress of library professionals	SA	A	U	D	SD
21	The benefit of information technology outweigh its monetary costs	SA	A	U	D	SD
22	Scientists and researchers are adequately served with the existing information technology facilities in the library	SA	A	U	D	SD
23	The abilities of the library professionals will not be properly utilised if information technology is used in the library	SA	A	U	D	SD
24	Information technology may cause a feeling of personal inadequacy among the library professionals	SA	A	U	D	SD
25	Introduction of information technology in libraries may result in the reduction of the number of library professionals	SA	A	U	D	SD
26	Information technology will enable library professionals to have more free time to do more interesting and imaginative work. i.e., more time for making decisions, planning and supervision	SA	A	U	D	SD
27	Information technology can force the complete retraining of the library professionals to do other duties more difficult than the routine ones	SA	A	U	D	SD
28	Information technology can reduce the level and the quality of interpersonal communication	SA	A	U	D	SD
29	Information technology can change professional 'territorial' workplace to something uncomfortable, even alien	SA	A	U	D	SD

**SECTION-III
(BACKGROUND)**

Note: Please tick the appropriate boxes

1. You are:
 - a. Male
 - b. Female

2. Please indicate your age group by ticking the appropriate box
 - a. Under 25
 - b. 26-30
 - c. 31-35
 - d. 36-40
 - e. 41-45
 - f. 46-50
 - g. 51-55
 - h. Over 50

3. Please indicate your highest degree obtained in **Library & Information Science**. (please tick the appropriate one)
 - a. Ph.D,
 - b. Masters,
 - c. Bachelors,

4. Please indicate other degree you obtained in addition to Library and Information Science. (please tick the appropriate one)
 - a. Ph.D,
 - b. Master's,
 - c. Bachclor's,

5. Your official designation is (please tick the appropriate one)
- a. Librarian
 - b. Deputy librarian
 - c. Asst. librarian
 - d. Documentation officer
 - e. System analyst
 - f. Senior technical asst./ senior professional asst.
 - g. Junior technical asst./ junior professional asst.
 - h. If others, please specify
-
6. You might have taken some of the below mentioned courses, either in the graduate or post-graduate level. (please tick the appropriate one):
- a. Introduction to Information Technology
 - b. computer application to library
 - c. Library Automation
 - d. Information Storage and Retrieval
 - e. System Analysis
 - f. Online Retrieval
 - g. Networking
 - h. Programming
 - i. Indexing/abstracting
 - j. If others, please indicate
- Name of the course _____
- Name of the course _____
7. Have you undergone training in any one of the following: (please tick the appropriate one)
- a. Workshop
 - i) Yes
 - ii) No

b. Continuing education coursei) Yes ii) No **c. Refresher course**i) Yes ii) No **8. If yes, please tick the appropriate box specifying the provider of the course****a) NISSAT**i) Yes ii) No **b) IASLIC**i) Yes ii) No **c) INSDOC**i) Yes

ii) No

d) DESSIDOCi) Yes ii) No **e) DRTC**i) Yes ii) No **f) UGC**i) Yes ii) No **g) ICSSR**i) Yes ii) No

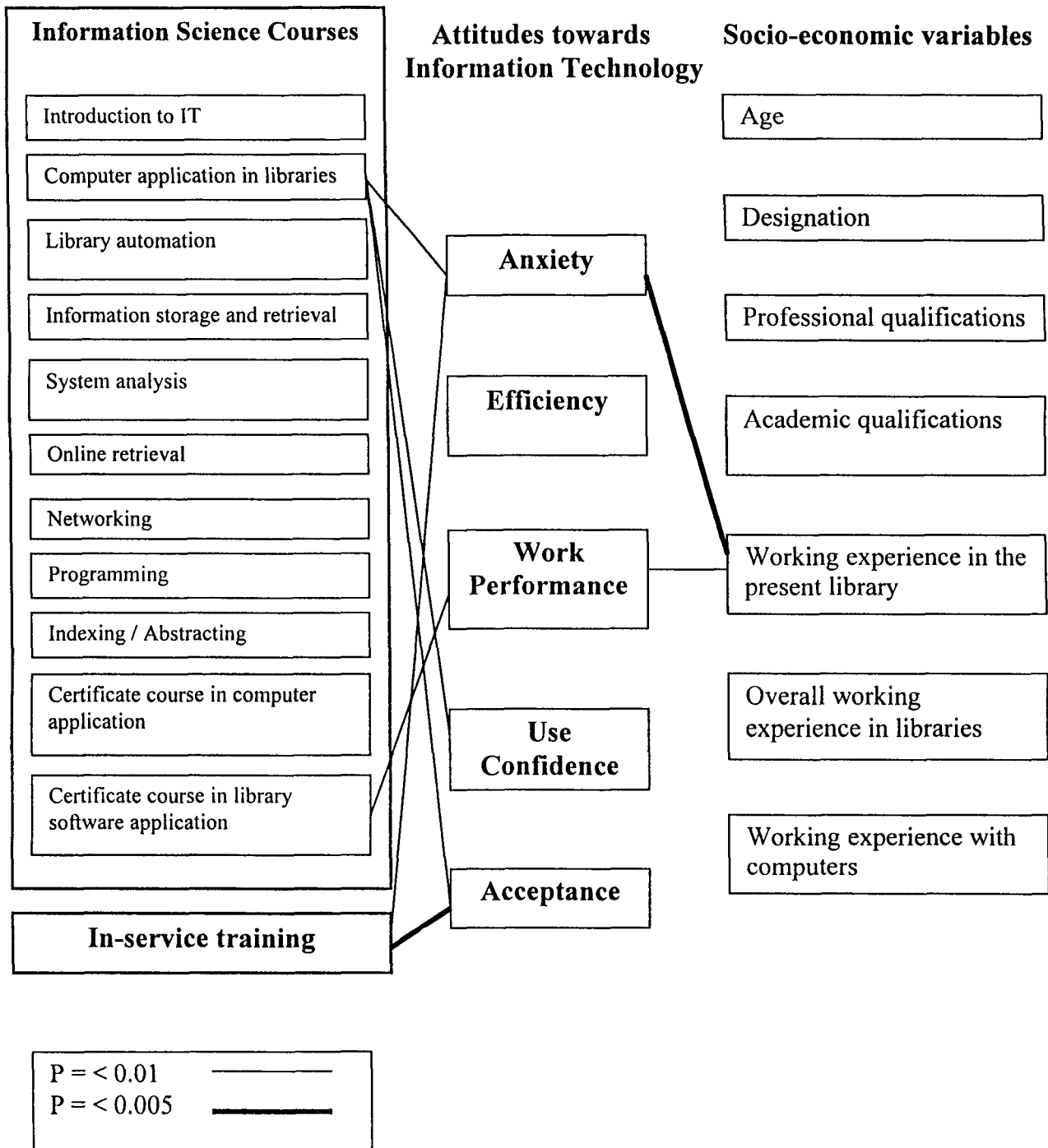
g) If others, please specify

9. Your experience in libraries are _____ years
10. Your experience in the present library is _____ years
11. You have worked with a computer on the job for _____ years.
12. The computer or computer terminal have been installed in your library for the last _____ Years
13. Please indicate library software/ database that you use in the library
- a) CDS/ISIS
 - b) LIBSYS)
 - c) Others _____
- OR**
- d) Software developed specifically by your own institution
- Name of the software _____
14. Signature, if you please _____

Annexure-IV

Fig-1

Intercorrelations between attitude towards information technology, information science courses, in-service training and socio-economic variables



CURRICULUM VITAE

NAME : T.TEMJEN
SEX : MALE.
FATHER'S NAME : TALIKABA.
DATE OF BIRTH : 12-05-1972.
NATIONALITY : INDIAN.
ADDRESS : CHUNG MIRS, DILONG WARD,
MOKOKCHUNG, NAGALAND.
798601

ACADEMIC QUALIFICATIONS:

<u>NAME OF EXAMINATION</u>	<u>BOARD/UNIVERSITY</u>	<u>% OF MARKS</u>	<u>YEAR</u>
H.S.L.C.	NBSE	46.42	1987
P.U. (Sc).	NEHU	43.22	1991
B.A. (Pass)	NEHU	44.41	1993
B.A. (Hons.)	NEHU	45	1994
M.Lib.Sc.	NEHU	63.71	1996
NET(JRF)	U.G.C		1997
Ph.D.	NEHU	SUBMITTED IN OCTOBER	2002

AREA OF RESEARCH : USER STUDIES

TITLE OF THE THESIS : "ATTITUDES OF ACADEMIC AND RESEARCH LIBRARY PROFESSIONALS TOWARDS INFORMATION TECHNOLOGY AND ITS RELATIONSHIP WITH LIBRARY AND INFORMATION SCIENCE COURSES IN INDIA"

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