CHAPTER - VI
SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSION

The present research has analyzed the various facts of LIS education, especially the IT components that are included in the syllabi of LIS departments in India. Aspects relevant for the research such as, curricula of LIS courses, IT related papers offered for LIS courses, IT infrastructure in LIS departments, faculty to teach LIS courses and handle IT based papers, duration of teaching of IT components, faculty provided with IT facilities, and the training requirement of faculty have been studied and the summary of the findings are provided here below.

A survey of opinions of the working librarians has also been undertaken to know the level of capability of LIS graduates and post-graduates while discharging the duties in libraries, especially the duties pertaining to the IT based library functions and services. The important findings of this opinion survey have also been depicted here.

6.1 IT Related Papers / Components in LIS Curriculum

6.1.1. By tracing the growth of LIS schools over the past five decades, one can visualize the gradual evolutionary trend. LIS departments in universities are offering various courses at bachelor and master degree level, including doctoral programmes in library and information science. The course contents and the topics in the syllabi have also been continuously updated noticing the trends and changes in the library functions and services. Application of information technology to the library services has paved the way for introducing IT based curriculum for LIS courses. Day-by-day, the percentage of IT components in the curriculum is increasing. This necessitates
the up-dating of IT infrastructure in the departments and the conduct of regular training/orientation courses for faculty.

6.1.2. Introduction of five year integrated master’s degree programme is a novel step which gives better opportunity for the LIS departments to cover all the necessary, as well as, the latest aspects of IT in the curriculum. There will also be sufficient time for the faculty to train the students with IT skills required to discharge duties with higher capability in the work situation. The students who undergo training for a period of five years, concentrating specifically on library and information science aspects will definitely be the better professionals with adequate knowledge and practical skills to shoulder responsibilities at top and middle management level. These professionals with adequate education and exposure to IT environment will be capable of extending quality services in libraries. They can also be the better faculty to teach IT based papers in LIS departments.

6.1.3 As regards the number of students who seek admission to various LIS courses in India, 39.15% of the students under regular mode, and 76.29% of the students under distance mode get admission to bachelor’s degree of one year duration. 3540 students under distance mode and 1444 students in the regular stream study for one year, leading to the award of BLISc degree.

The teaching and training for the bachelor degree course is being conducted for a period of 10 to 11 months. Within this short period, the students will be taught the basic and traditional papers like Classification, Cataloguing, Library Management, Foundation of LIS and Society, Reference service, Information Sources and Services. These papers will take the major portion of one year duration. Therefore, the students will not get adequate time for training and exposure to IT environment. Not much of IT components can be taught at the bachelor’s degree level. Therefore, the contention is that the
bachelor’s degree students with limited knowledge and skills in handling IT based information services can be appointed against semi-professional posts which do not carry much responsibility of rendering technical services. Digital information services need higher knowledge and skill. Further, in the present situation of IT environment, one cannot expect quality performance from the BLISc degree holders. It is also worth recommending that LIS optional paper can be introduced for three year B.Sc., programme, wherein there will be sufficient time to teach all the necessary papers in 3 years.

6.1.4 The study shows that not much of IT components or exclusive paper on Information Technology is being offered for BLISc course. Only certain fundamental aspects of IT applications have been included in two of the papers,

1. Information Systems and Services
2. Information Retrieval System

These two papers are found to have been included in the curricula of 12 and 7 departments respectively. From this it is clear that BLIS students will not get sufficient knowledge and training as regards IT based papers. Hence, in the recent past many of the LIS departments offering bachelor degree course has started offering two year master degree courses abolishing one year bachelor degree programme. The same is indicated in chapter 3 which deals with historical development of LIS education in India.

6.1.5. In the case of master degree programme of two year duration, there are relevant IT related papers such as, Application of Information Technology to LIS, Internet Technology and Web Resources, Networking and Data Communication, Marketing of Information product and Services, and Digital Library System. These papers will make the students study in depth, the IT aspects that are expected while discharging the duties or handling the services in the IT wing of modern libraries.
Among the electives papers offered for master degree programme, it is pertinent to note that 24 LIS departments offer IT related papers like Information Technology for LIS, Digital Library System, Web-design and Electronic Publishing, Information Search Strategies, Networking and Multimedia Application. The percentage of departments offering IT related papers account for 63.16%.

6.1.6. As regards M.Phil course, the students are made to study to a great extent the aspects related to Research Methodology, LIS Education including preparation of project work. There will be one exclusive paper which deals with IT aspects. From among the elective papers, majority of the papers deal with a particular type of library system and its services. However, few papers that are included under electives for M.Phil course are Library Automation, Networking, Internet Technology and Web Resources, Web design and E-publishing, Recent Trends in ICT, Database System for LIS, Open Archives, Marketing of Information Products and Services and Digital Library System. It is deduced from the data that the 25% of the papers for M.Phil course are exclusive papers related to IT aspects. From this it is clear that 20% of the elective papers for two year MLIS course and 25% for the elective papers for M.Phil course are exclusively IT based papers. The librarians working in various libraries in India have suggested in the opinion survey to introduce more IT related papers for Master degree courses. Many of the LIS departments encourage their M.Phil students to take up the compulsory project works relating to IT aspects that are found applicable in the modern library services.

6.1.7 In the present study, 29 IT related papers have been identified covering 77 LIS departments. These papers are brought under 10 titles listed below. The related and similar papers are clubbed together and brought under 10 papers.
76.32% of the LIS departments has shown Basic Computer Applications in the curriculum of two year MLISc course. 71.05% of the LIS departments has indicated Advanced ICT for Library and Information Services. Further, 34.21% of the LIS departments offers Library Automation for MLISc course. 28.95% of the LIS departments has included Database Management/RDBMS as one of the papers in the curricula. 28.95% of the departments has shown Data Communication and Networking as one of the IT related papers in their curricula. Internet Technology and Web Design, E-Publishing are identified as IT related papers by 36.84% of the LIS departments. It is only 3 departments representing 7.89% have offered System Analysis as one of the IT related papers in their curricula.

Now it is clearly evident that for master’s degree course of two years duration, LIS departments commonly offer the following four as IT related papers.

- Basic Computer Applications
- Advanced ICT for Library and Information Services
- Library Automation
- Database Management/RDBMS
It is also worth mentioning here that equal duration of practical hours is allocated for all of these IT related papers. However, with reference to the paper Digital Library System, more of theory is shown than practical sessions. Among 6 LIS departments offering the paper Digital Library System, only two are conducting practical sessions as per the course contents. Rest of the departments restricts their teaching programme to the conduct of guest lecture or special lecture without practical sessions. In the present day library situations, practical exposure of handing IT based services is found essential. Hence, monitoring of conducting practical sessions is essential.

6.1.8 For one year MLISc course the number of IT related papers are comparatively less. It is evident that 78.38% of the LIS departments has included Advanced ICT for Library and Information Services in their course contents. Yet another 21.62% of the LIS departments offer Basic Computer Applications. The papers Database Management/RDBMS and Library Automation are offered as course contents in 10.81% of the departments each. Rest of the IT related papers are being offered at not more than 2 LIS departments. Therefore, IT related papers offered for one year MLISc course is limited to the basic papers or basic concepts of information technology.

For one year BLISc course, majority (79.49%) of the LIS departments representing a large segment others Basic Computer Application. Out of 39, 31 departments offer this paper. It is only 7 departments representing 17.95% and 3 departments representing 7.69% offer IT related papers of Advanced ICT for LIS and Library Automation respectively. From this it can be deduced that basic papers on the applications of IT is offered for BLISc along with traditional papers. Apart from this basic paper, due to time constraint not much can be taught for the students of one year bachelor’s degree. Therefore, the training and skills on IT applications is limited to the students of BLISc. The same perspective is up held in the opinion survey where the working librarians
feel about the capability of BLISc graduates. Therefore, taking into consideration the advances in LIS and the skill requirement to extend services in modern libraries, it is appropriate to provide education and training in LIS for two years so that, the students will be capable of managing library services independently with higher capability.

6.1.9 The IT components in the LIS curriculum has to be up-dated frequently. Responses have been sought from the 77 heads of the departments regarding the extent of up-to-date and need based IT components in the curriculum. 41 heads of the departments representing 53.24% opine that the extent of need base and up-to-datedness of the IT components in the curricula is indicated in the highest range. Another segment comprising of 36.36% state that the extent is in the range of 51% to 75%. From this it is clear that the IT components included in the LIS curricula of majority of the departments is up-to-date and need based. Only a meager segment of 8 department heads feel that the IT components included in the curricula needs to be up-dated to a moderate extent. Noticing the need of IT wing in libraries, the syllabus has to be revised frequently. To identify the need, a survey has to be conducted periodically at national level covering various libraries in India.

6. 2. IT Infrastructure in LIS Departments

6.2.1 Day-by-day, the library users demand the retrieval of precise information and relevant information in an expeditious manner using digital technology. To meet such requirements of the users, it is up to the LIS departments to educate and train the students who can render digital or IT based services in libraries. To impart quality education and training, the LIS departments should possess essential and latest IT infrastructure. LIS Departments with inadequate IT infrastructure cannot aspire for extending quality education to the students from the point of modern library expectations or modern library needs. Further, there should be compatibility between IT
components included in the syllabus and IT infrastructure made available to the students in the departments.

6.2.2 The present study showed that 94.8% of the LIS departments, ie, 73 departments out of 77 possess IT labs or computer labs of their own. Out of these 73 departments, 62 possess one computer lab, and 10 departments have two computer labs. Only 4 departments, representing just 5.2% do not possess IT labs or computer lab at all for conduct of practical sessions. These 4 departments depend on the computer lab facilities of other departments/institutions available locally. For instance, LIS departments of KSOU though offering LIS courses over the past 6 years, is depending on the Center for Information Science and Technology (CIST) of the University of Mysore for the IT lab facility. It is also pertinent to note that LIS departments offering courses through distance mode rely upon IT lab infrastructure of other institutions for conduct of practical classes or contact programme.

Departments that offer courses through distance mode, call upon their students for contact programmes of short duration ranging from 10 to 20 days. Therefore, the departments hire the computer lab facilities of other institutions for a brief period of contact programmes. Very few departments rely upon library digital wing or internet center of the library for conducting the practical classes. What is important here is that computer facilities have to be provided to the students in the ratio of 1:1. Students should not be made to share the computers that are existing in the labs belonging to other institutions or the library.

6.2.3. Amongst the 77 LIS departments, 25 departments representing 32.47% possess adequate number of computers in the labs for conduct of practical sessions. It is only 16 departments amounting to 20.78% possess less than 10 computers in labs. With this limited facility, they are compelled to
conduct practical classes in several batches. There is real need of increasing the number of computers so that, the ratio of computers to be provided to students will have to be 1:1. Quality training cannot be extended where the number of computers is inadequate when compared to the number of intake of students. In such cases, step should be taken with the university administrations to increase the number of computers, really needed for the practical sessions. 41.50% of the departments possess 11-20 computers in their labs. Considerable percentage of LIS departments representing 24.68% possesses 21-30 computers. These departments can conveniently organize practical sessions without any hindrance. Above all, in 20.78% of the LIS departments there is felt need of increasing the number of computer systems in labs.

Further, where there is limited number of computers in the labs, when compared to the number of intake of students, teachers have to conduct practical sessions in several batches. Under this situation, the teachers have to repeat the lab instructions, as well as, guidance several times. Here, there is the possibility of undermining the quality of instructions and guidance being extended. Hence, where there is more intake of students, there should be corresponding increase in the number of computers in the labs. To be categorical, computer should be made available to the students in the ration of 1:1 for quality training and customer satisfaction.

6.2.4. It is encouraging to note that 92.2% of the departments possess internet browsing facility. It is only in 6 departments representing 7.8% there is no internet browsing facility. Some of these departments are conducting LIS courses through distance mode. Those departments which do not possess internet facility rely upon other institutions. While referring to LIS curriculum, it is evident that internet connectivity and the computer terminals are quite essential for conduct of practical programmes. In fact, it is not appropriate to
conduct classes of Internet Technology and Web Information Sources without or inadequate internet browsing facility. All the LIS departments should invariably be equipped with internet browsing facility as the latest trend demands knowledge and skill in tracking information resources available on the web.

Referring to the number of internet terminals available in the departments, 43.65% of the LIS departments possess more than 13 browsing terminals. Whereas, in 40 departments representing 56.34% there is lack of internet browsing nodes. Here, the number of nodes does not exceed 12. Those LIS departments which possess less than 12 terminals (more of intake) have to be treated as departments with lack of internet facility. With this limited internet browsing terminals, students, as well as, teachers face problems and constraints. These departments with limited facility struggle to provide individual terminals to each student during practical sessions. Therefore, the recommendation is that they have to increase the browsing terminals, immediately on top priority.

6.2.5. As regards projection aid facilities for conduct of theory and practical sessions, 62 departments representing 80.5% possess over-head projectors. Again, amongst the 77 departments, 61 departments comprising of 79% possess LCD projectors for teaching. Therefore, it is really encouraging to note that a great majority of the LIS departments possess OHP and LCD projectors. The concept of using projectors in LIS departments to support teaching programme has to be appreciated. While concluding, it is worth insisting that 16 departments representing 21.8% have to procure LCD projectors for supporting teaching theory and practicals.

6.2.6. While referring to the facility of laptop in the departments, 62 departments out of 77 representing 80.5% do not possess laptop in the
departments. It is only in 15 departments (19.5%) the teachers are using laptops while taking classes. The use of laptop by faculty will definitely ensure quality training from the point of students. The facility will enable the teachers to come with adequate information and preparation for both theory and practical classes. Providing laptop in LIS departments will facilitate the project works, as well as, individual research projects of teachers.

More than anything, by using laptop considerable amount of time of teachers can be saved while gathering and presenting information. Laptop with internet connectivity will immensely help the teachers in providing quality education while delivering guest lectures and also research contributions or research output. While deducing the data, it is certain that laptop should be made available to the faculty where there is emphasis on teaching of IT components or handling exclusive IT based course contents.

6.2.7 As regards lack of IT infrastructure, 27 LIS departments do not possess scanners. 63 LIS departments do not have web camera. 68 departments out of 77 do not possess video camera. However, 75 LIS departments amounting to 97.40% have got printers. LIS departments without web camera have not made any attempt to conduct online viva-voce or online interactive tutorials. By the presence of video camera or handicam in the department, students will be benefited while preparing their project work. Many a time students need to capture video clippings essential for project work. The facility is needed by students while preparing multimedia projects.

6.2.8 Open source library automation software packages are being used in LIS departments for giving practical orientation to the students. 74% of the LIS departments are training students with WINISIS, 19.4% with KOHA and 27.2% of the departments train with NEW GEN LIB. Quite a number of departments train the students with commercial software packages such as
LIBSYS, LIB SOFT and EASY LIB. 75.3% of the LIS departments train with these commercial software. 58 departments out of 77 possess these commercial software packages. Further, 54 LIS departments comprising of 70.1% use SOUL software of UGC-INFLIB NET. The training on these open source and purchased software will provide the students with experience that make them take up responsibilities when they are appointed in libraries. Still there are 23 LIS departments representing 30% which have not purchased commercial software packages so far. These departments have to take immediate steps to purchase the licensed version of the latest software for giving practical orientation to the students.

Licensed version of software carry all the features essential for practical orientation. Due to the paucity of funds, 52% of the LIS departments suffer from the non-availability of important automation software that are commonly used in the libraries across the country.

6.2.9 As regards Operating System software, such as Windows, Unix, Linux on one hand, and MS office and Anti-virus packages on the other, a great majority of the LIS departments representing up to 98.7% possess software packages of this category (M.S Windows). 29 departments use Linux and 13 departments possess Unix. It is encouraging to note that all the departments except one has got anti-virus, and operating system software.

In respect of the adequacy of IT infrastructure in the LIS departments, the concerned heads or chairpersons of the departments have expressed their opinions. Out of 77 heads of the departments, 41 representing 53.2% have felt that IT infrastructure in their departments is adequate for conduct of practical classes. The remaining heads of the departments hold the view that the IT infrastructure is inadequate to meet the needs of practical sessions. From this it is clear that IT infrastructure in 36 departments representing 46.8% according
to the chairpersons/heads, have to be updated so as to handle IT practicals without any constraint. The chairpersons have also identified various reasons for the lack of IT infrastructure.

Among the reasons quoted for the inadequate infrastructure, 58% of the respondents feel that the departments suffer on account of the paucity of funds. Here, the lack of budget is indicated in the higher range. 47.2% of the respondents opine that there is lack of knowledge to the faculty to include and handle IT component. The third segment of respondents (chair persons) quote the reason of lack of importance given to the LIS education or LIS department in their universities. This segment of respondents represent 58.3%. It can be concluded here that because of these three reasons there is serious setback in developing adequate IT infrastructure in LIS departments in India.

6.3. Teaching Faculty in LIS Departments

6.3.1 From among the 77 LIS departments, there are 353 teaching positions. 18.13% of the posts are of Professors, 28.18% of the posts are of Readers and the remaining 52.69% of the posts are of lecturers. While considering the teachers working in the 77 LIS departments, as of 2008-09, there are 73 Professors representing 12.81%, 129 Readers and SGL representing 22.63%, 145 Lecturers and senior Scale Lecturers representing 25.44%, 165 Part-time/Temporary Lecturers and Guest faculty representing 28.95% and 42 visiting faculty representing 7.37% and 16 Lab Assistants which constitute 2.81% among the total population of LIS teachers community. Presently, 570 teachers are rendering service in the 77 LIS departments

6.3.2. It is important to note that altogether, 54.39% of the teachers are lecturers and 28.95% of the teachers are serving on temporary basis. There is every possibility of them leaving the universities any time when they get suitable placement on permanent basis or better job opportunity, elsewhere.
This will hamper the quality of education and directly affect the teaching-learning process while the students are half-way through the courses. This presupposes that there is innate need to initiate action to fill-up the vacant positions or create teaching posts and recruit teachers on top priority because; ultimately it is the teachers who are going to produce competent LIS personnel.

In some of the LIS departments where there is lack of faculty, there are literally no clear vacancies of teachers but the positions are created on adhoc basis against the teaching workload. Immediate steps needs to be initiated to get the posts sanctioned and see the posts are filled up at the earliest. This process will ensure regular teaching and development of employable skill and competency among the students.

6.3.3 While considering the percentage of teachers who handle IT related papers, it is evident from the research that 47.94% of the professors, 75.96% of the Readers and SGL, 68.27% of the Lectures/Senior Scale Lectures, 59.27% of the Part-time/Temporary Lecturers and Guest Faculty, 90.5% of the Visiting faculty handle IT related papers. It is also important to note that all the 16 Lab Assistants are handling IT related practical classes. They assist teachers as well as, students while conducting practical sessions. 9 of them representing 56.25% are capable of delivering instructions during the practical sessions.

6.3.4 Another important finding of the study is that the Professors are found to have been handling traditional papers. Only 35 Professors representing 47.94% handle IT related papers. However, among the 35 Professors who handle IT related papers, only 13 Professors handle practical sessions along with theory class. This segment of Professors who handle practical classes account for just 37.14%. From among the total population of Professors, 17.8% handle IT practical classes, in addition to the theory papers.
As the Professors in many universities are entrusted with the responsibility of administration of the department, and organization of extension programmes, rarely they find adequate time to guide the students during practical sessions. They also express that they serve as members of various academic bodies of the universities. Under such circumstances, lecturers, guest faculty, part-time faculty will handle practical sessions. Most of the time, lectures working on part-time and temporary basis handle practical classes.

An important recommendation here is in respect of handling practical sessions, care should be taken to monitor practical sessions so that, experienced faculty and teachers with capability be entrusted to handle practical sessions rather than leaving the practical sessions to the junior faculty who are appointed on temporary and part-time basis. Neglect in monitoring quality in the practical sessions will hamper the learning process and the students will face difficulties in getting their doubts resolved, and also while following the procedures in a systematic way, within the time limit of lab sessions.

6.3.5. Visiting Faculty appointed to teach various subjects of LIS is an important aspect to be commended. It is a right decision to be appreciated, because the experienced and competent senior faculty from outside the university will handle few of the papers or topics. The students will get good inputs from these subject experts from time to time. There are 42 Visiting Faculty from 77 LIS departments, 90.5% of them handle IT related papers or topics. When some of the departments do not have competent faculty to effectively teach IT papers, it is a good practice to invite Visiting Faculty to handle such IT related papers. This is an encouraging factor worth placing on record.

6.3.6. Considering the entire population of LIS teachers, from all the categories, 67.71% of teachers handle IT related papers. Since the application
of IT for library services is of recent origin and still in the process of evolution, it is positive sign that 67.71% of teachers handle IT subjects/topics and in the future, the percentage of teachers who handle IT related papers will gradually increase noticing the necessity.

6.3.7. Another important aspect to be noted here is that major portion of the IT related papers are being handled by Readers and SGL. This category of teachers has got long experience of more than a decade and in fact is a good decision to assign IT related papers to such senior faculty expecting quality education and satisfaction from the student community. 75.96% of the Readers and SGL are found to have been handling IT related papers.

6.4. IT Infrastructure provided to Faculty

Teachers who handle IT based papers with competency is one important aspect and another aspect which is equally important is the IT infrastructure facilities that are made available to these teachers. 85.7% of the LIS departments provide computers with internet connectivity for the teachers. This is really an encouraging factor. The teachers who are in rest of the departments representing 14.3% have still to get the facility. These departments have to provide facilities at the earliest so that effective teaching and more of subject contents and information in a systematic way can be delivered to the students. In 33.3% of the departments, the faculty members have to use the common facility made available in the department. Faculty, here have to share the common internet browsing facility. Teachers who really impart quality education and latest knowledge, inevitably need essential infrastructure which includes laptop/computer and internet connectivity. Possessing these essential gadgets facilitate access to up-to-date and comprehensive information, including entry into the world of electronic information resources and digital libraries of books and journals.
6.5. Training Requirements of Teachers

As feedback, the heads of the departments of the 77 LIS schools have responded as regards the training requirements of the teachers who handle IT related papers. Teachers working in 63 LIS departments require training/orientation in IT disciplines in order to update their knowledge and skills. From this it is clear that 81.8% of the heads of the department have identified the training requirement for their teaching staff. According to them, training has to be given to the teachers in order to handle practical classes effectively. It is only 14 department heads representing 18.2% have expressed that their faculty is up-to-date and competent in handling IT based papers, including the practical sessions.

Among the 63 departments, 22 department heads representing 34.9% opine that their faculty need intensive training in handling IT related papers. Another segment of the heads of the departments opine that the training requirement is only to a moderate extent. Yet another segment of the heads of the departments state that the training requirement is only to a little extent. It can be concluded that a great majority of the faculty working in LIS departments need training to update themselves in order to handle IT related papers. Among the teachers from the 77 LIS departments who need training account for 81.8%. Therefore, it is recommended to organize training programmes or workshops of 4 week duration on the IT related areas of LIS. The UGC, Academic Staff Colleges, individual universities, and professional associations may organize such of these training programmes periodically noticing the need and the specific areas of IT applications. It is also desired to obtain feedback from the faculty trainees for evaluation of the effectiveness and usefulness of training and to apply corrective measures, if there are any deviations and lapses.

6.6. Reasons for Lacunae in the Syllabi

The heads of the departments have also indicated the reasons for not updating the IT components in the syllabi. The following are the strong reasons indicated along with the degree or extent.
1. Lack of interest to learn and enthusiasm to effectively handle IT based papers. Teachers seldom enjoy their teaching nor have concern towards students. 77.9% of the respondents hold this view and the extent is specified in the moderate range.

2. Lack of knowledge and skill (competency) to handle IT topics and hence the curricula is not thoroughly up-dated though there is need in the work situation in libraries. 75.3% of the respondents are in favor of this view and the extent is indicated in the moderate range.

3. Lack of budget and infrastructure to include latest aspects of IT in the curriculum. 26% of the respondents in the higher range opine that the paucity of funds has affected the development of facilities in the department and therefore, IT components are not up-dated as per the present trends.

4. Assigning lower priority to the department of LIS in the university set up is identified as one of the reasons. 28.6% of the respondents hold the view in the higher range.

Therefore, competent staff who can handle IT related papers effectively, including the practical papers be appointed. Intensive training has to be provided to the existing staff for better knowledge and skills. Action plan has to be evolved even for obtaining sufficient funds for up-dating the IT infrastructure facilities in the departments.

6.7 Teaching Hours of IT Components

1. It is pertinent to know the number of hours the IT components are taught for LIS courses. The percentage of hours the IT papers are taught has to be considered while determining the adequacy of education. With reference to the two year MLISc course, majority of the departments, on average teach IT related papers for 18 to 24 hours per week, considering both the years.
2. With reference to the one year MLISc course, majority of the departments, on average teach IT related papers for 8-12 hours per week.

3. With reference to BLISc course, majority of the departments, on average teach IT related papers for 8 to 10 hours per week.

4. With reference to M.Phil course, majority of the departments, on average teach IT related papers for 7 to 9 hours per week.

It can be inferred that for two year MLISc course, the percentage of IT components in the syllabi is more and the number of hours of teaching IT components is more when compared to other LIS courses. In case of two year course, there will be ample of time to cover more aspects of IT than in one year courses.

Quite a number of departments offering M.Phil course (87.5%) have not included practical sessions in their course contents/time table. As there are many new advances in the IT sphere, and working librarians as employers expect competency in handling IT based services in libraries. Thus, it is essential to include and emphasise practical sessions covering IT components for M.Phil course also.

As regards LIS departments extending extra practicing hours for improving IT skills among the students, 69 departments representing 89% have responded positively. These departments encourage students to gain IT skills by allowing them to work in labs whenever they find free time, and also apart from class hours. Only 8 departments do not allow the students to enter the lab after the regular practical hours. This is because of the dependency on IT infrastructure of other institutions/departments and also stipulated period assigned to part-time and guest faculty. Development of IT skills and competency will improve mainly on the number of hours the students sit before
the terminals and practice. Therefore, it is a good practice that departments allow students to enter the computer labs and practice for longer hours.

6.8. Opinions of Working Librarians on IT Components of LIS Courses and the Capability of Professionals

The practical relevancy of IT components offered for LIS courses and their extent of up-to-datedness form the point of work environment has been decided by the working librarians of various libraries in India. The summary of the findings of the opinion survey and the recommendations of those librarians are presented here precisely.

6.81. In respect of IT components taught in LIS departments considering all the courses, 93.5% of the LIS departments teach Operating System, 88.31% of the LIS departments teach M.S. Office suit. Further, Internet Technology is taught in 87% of the departments, web Design is taught in 68.8% of the departments, E-journals and Content page service is taught in 70.1% of the departments. Networking and System Security, as well as, Library automation is taught in 80.5% of the departments. Web Resources is taught in 79.2% of the departments. For various reasons the percentage of LIS departments which does not offer practical sessions for some of these papers range from 10% to 18% out of 77 departments. Barcode Technology is taught in 37 departments but, only 23 departments offer practical session with equipment. These departments should make it a point to include practical sessions in the timetable and systematically conduct classes as IT based papers are important and the competency of the staff is mainly judged on the knowledge and practical skills in IT applications.

6.8.2. Response on LIS curriculum

6.8.2.1. 49.3% of the respondents opine that the LIS syllabus is up-to-date to the extent of 51% to 75%. Another segment of respondents representing 15% feel that the syllabus is up-to-date in the higher range of 75%
and above. 32.1% of the respondents express that the syllabus is up-to-date only to a little extent of 25% and below.

6.8.2.2. In respect of the relevancy of curriculum to practical situation in libraries, it is encouraging to note that 89.3% of the respondents have given positive response. The LIS syllabus being taught at the universities really has relevancy to the practical or professional work in libraries. Only 15 respondents representing 10.7% opine that there is no relevancy between what is being taught in LIS departments to what is being practiced in the libraries. Further, 41.6% of the respondents feel that the LIS syllabus being taught is highly relevant to their practical situations. 53.6% feel that the relevancy is to a moderate extent and only 4.8 state that the relatively is very low. It can be concluded that the syllabi have relevancy to practical situation in libraries today.

Table 90

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Necessary IT Components / Papers</th>
<th>Bachelor Degree (One year)</th>
<th>Master Degree (Two Years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fundamentals of Computers</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td>O.S and M.S Office Suit</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>3</td>
<td>M.S Access</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>4</td>
<td>Data bases Introduction to RDBMS (Oracle/MySQL)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>5</td>
<td>Internet Technology and Web Resources</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>6</td>
<td>Web Design-HTML,</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>7</td>
<td>Web Design-XML, E. Publishing</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>8</td>
<td>Web2.0 and its applications in libraries (Blogs, RSS, Folksonomy, Social Networking)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>9</td>
<td>Digital Library System: e- journals, e-books</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>10</td>
<td>Library Automation Software</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>11</td>
<td>Bar code technology /RFID</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>12</td>
<td>Networking and System Security / Firewalls</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>13</td>
<td>Visual Basic</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Resource classification standards –MARC21, Dublin core, VRA etc</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>
As regards the statement that the IT component is not thoroughly included in the elective papers of LIS departments, 79 respondents representing 56.4% agree, and another 16 respondents representing 11.4% strongly agree with the statement. Therefore a major segment of the respondents opine that the IT components are not thoroughly included in the elective papers.

6.8.2.3. IT components recommended for LIS courses

The table 90 furnishes various IT components / papers recommended for bachelor and master degree course of LIS. These are recommended based on two criteria. (1) considering the new trends and developments in the Information Technology wing of the modern libraries, especially the information service being extended in research libraries, medical and engineering college libraries, university libraries and management institution libraries (2) analysing the recommendations of the working librarians as to the need of incorporating essential IT components in the syllabi of bachelor and master degree courses. The working librarians based on their practical perceptions have suggested the necessary IT related areas in which training is essential for students in order to develop employable skills, and to handle the responsibilities, independently and effectively when they are recruited in libraries. Similar study conducted by Mathews and Pardue⁶⁸ also supports the views.

The table depicts fourteen components of information technology that are considered to be essential for librarians to serve in the IT wing of the libraries. Out of the fourteen topics, eight topics are recommended for bachelor degree and all the fourteen are recommended for master degree course. Those who study the eight papers during bachelor degree of one year, the remaining six papers may be covered in the master degree course of another one year. There is also the need of increasing the number of hours devoted to the teaching of IT related papers than that of some of the traditional theory papers dealing with library and society, library management, reference service and
user studies. More emphasis on learning of IT based information service, will help developing better employable skills, and thus spoke the working librarians.

6.8.2.4 Work experience or exposure to IT environment in libraries is an essentiality to develop professional competency and confidence. In this regard, an overwhelming majority of the respondents/librarians to the extent of 90% support the view and hence work experience in the IT wing of the library is essential before awarding the degree in LIS. Those who work in libraries can handle the IT based library functions and services up to the expectations of the library users with greater capabilities of shouldering responsibilities assigned by the employers.

Specifically pertaining to the extent of work experience needed, 88.08% of the respondents express that 3-6 months (of internship training) is essential for familiarising the IT skills required for practical situation.

6.8.2.5 As regards the level of capability of fresh recruits in handling IT based library functions and services, the respondents opine that master’s degree holders are the right choice to handle IT based services in an efficient way. The bachelor’s degree holders with their limited knowledge and training are not found suitable to discharge the duties or handle responsibilities in IT wing of the library. Bachelor’s degree holders with intensive training or long experience can handle IT based services up to the expectations.

Specific IT based services such as, Internet browsing, CD Search services, handling online subscriptions, SDI Services, Creating and Managing OPAC, Installation of Software, Hardware Trouble Shooting, Acquisition and Serial Control using automation tools, - all these specific tasks in libraries
demand greater skill and work experience. Therefore, respondents feel that master’s degree holders can exhibit better performance.

6.8.2.6 While using software packages and handling hardware trouble shooting, master’s degree holders are highly capable and the bachelor’s degree holders are cannot efficiently handle the task. Performance of the bachelor’s degree holders is specified to be poor as regards the installation and use of software, and handling hardware in libraries.

6.8.2.7. As regards number of years of work experience needed to adequately learn IT skills to discharge the duties independently, 75.7% of the respondents are of the opinion that the bachelor’s degree holders need 2-3 years to adequately learn IT skills required for practical situation. However, the master’s degree holders learn the same adequately within a year.

Finally, it can be concluded that the professional staff with bachelor’s degree need intensive training of long duration for exhibiting better performance in work situation. Application of information technology has increased considerably in library services. The same has to be taught in LIS courses so as to meet the expectations in the library. Therefore, all the aspects of information technology, together with the basic aspects of library functions and services cannot be taught in one year course Therefore, it is appropriate to provide adequate education and training in LIS for a period of two years. The bachelor’s degree holders can serve in the library as semi professional staff with limited knowledge of IT applications.

6.8.2.8. Working librarians as respondents in the present study have pointed out the major lacunae in the LIS curriculum considering the practical situation in libraries. It is interesting to note that 87.1% of the respondents are of the opinion that the LIS schools emphasize more on the conduct of theory
classes, neglecting the aspect of training the students. This is totally evident when one refers to the percentage of teachers who handle IT practical sessions.

Further, 75.7% of the respondents point out that the project work is given least importance and therefore, the newly appointed professionals find it difficult to independently handle IT based services. Moreover, due to the lack of writing skills, they are unable to prepare reports and correspond with outside organizations in English. Another segment of respondents representing 75% state that there is inadequate IT infrastructure in LIS departments to train the students from the point of handling the IT based services established in the modern libraries. 77.1% of the respondents again points out that there is lack of time for conducting practical sessions or providing hands-on experience in LIS departments. On the other hand, 58.6% of the respondents feel that the teachers working in LIS departments are not fully competent to provide training on recent advances in IT based library functions and services. With this intention, some of the LIS schools have not up-dated their syllabi covering the recent developments of Information and Communication Technology.

**Table 91**

**IT skills sets / components suggested by working librarians**

<table>
<thead>
<tr>
<th>Skill sets</th>
<th>Specific Topics / Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programming language</td>
<td>Visual Basic, Java, C, C++, SQL</td>
</tr>
<tr>
<td>Networking</td>
<td>LAN Administration, Network Design, Network Security, and Network Management</td>
</tr>
<tr>
<td>Web Development</td>
<td>HTML / XML, Front page, Dreamweaver, authoring Web pages, maintaining Web sites, Web 2.00</td>
</tr>
<tr>
<td>Project Management</td>
<td>Managing IT projects, and supervising personnel</td>
</tr>
<tr>
<td>Systems Development</td>
<td>Systems design and analysis, object modeling, database creation</td>
</tr>
<tr>
<td>Systems application</td>
<td>Installation of software, upgrading software, maintenance installation and trouble shooting of hardware, maintenance and backups</td>
</tr>
</tbody>
</table>
The above table gives certain areas of IT skills suggested by the working libraries. These skills are said to be essential for the posts of professional in order to serve in the IT wing of modern libraries.

6.9. Area Suggested for Further Research

From the present study, it can be deduced that there is need for in-depth study on the ICT skills of LIS teachers in India. It also presupposes the identification of specific areas of IT applications from the curriculum and the extent of training requirement needed to handle IT related papers in the LIS schools. This can be a topic suggested for further research.

6.10. Conclusion

Since the past two decades, information has become an indispensable commodity for technological growth and human development. Noticing this trend, library and information centers have started providing information service up to the expectations of the academicians, scientists, researchers and technocrats. In this venture of extending quality information service, libraries and information centers inevitably have to adopt information technology mainly to capture, analyze, preserve and disseminate information overcoming the time and distance barriers. Accessing information at any time, and from anywhere has become the essential needs of library users and the librarians as information gate keepers has to develop capabilities and skill to render the service.

Considering the above developments in the sphere of library and information science, of late, educational institutions and universities started giving prominence to LIS education. The purpose is to meet the need of technical human resource to establish and extend information services in libraries, by adopting digital technology. Development of library and information centers and LIS education is like two sides of a coin. Both of these
consider the changing needs of the society and adapt Information Technology with the main intention of providing quality information services through the well trained professional staff with higher capability and performance. Need based quality education and training to handle information services, especially of the digital information services has become the purpose of LIS departments in the recent times.

63.16% of the LIS departments offer IT related papers, covering most of the essential aspects of IT components in the light of modern library requirements. Since the practical situation in libraries demand higher capability and skill acquired from experience, the LIS departments have to give more weightage to the teaching of IT related papers with emphasis on conduct of practical exercises and project work preparation. Working librarians have suggested to include more of IT practical sessions, individual project preparation and internship training in libraries. Monitoring of practical session and the performance of teachers during the practical sessions may be necessary to avoid non compliance lapses / deviations from accepted procedures. Performance audit with constant monitoring mechanism of the practical classes with ‘lesson plan certification’ by the students may be worth implementing to ensure quality training and thereby avoid entrusting practical sessions to lectures who are appointed on part time and temporary basis.

In 41 LIS departments, representing 53.24% the IT components in the curriculum is up-to-date to the higher extent of 75% and above. Most of them have yet to revise and up-to-date their syllabi. Periodically, a survey at national level be undertaken every 2-3 years with the objective of studying the latest developments in information service, covering modern libraries attached to research organizations, engineering and medical institutions, management science institutions and universities in order to capture the latest IT components to be incorporated to the syllabus of LIS courses.
The development of IT infrastructure and its maintenance is another sphere which needs greater attention as the teaching programmes, as well as, prescribing the syllabus rely upon the adequate infrastructure facility. Above all, what is important here is that there should be compatibility between IT components prescribed for LIS course on one hand, and availability of suitable IT infrastructure in the department on the other. Under no circumstances, students should be made to share the computer systems. Computer must be provided to the students in the ratio of 1:1. Without adequate number of computers, internet connection and automation software, the present day requirement of IT skills and knowledge cannot be inculcated among the students. The teachers who handle IT papers and aspire to extend effective training and quality education be provided with laptop and internet connectivity as essential facility. The senior teachers really use this facility as the study shows that 75.96% of the teachers and Selection Grade Lecturers (faculty with long experience) handle IT related papers in LIS departments.

It is also worth mentioning that one third of the teachers who serve in the LIS departments are appointed on ad-hoc or temporary basis. These faculty members will continuously be seeking suitable placement opportunities and they leave the teaching assignment while the course is half way through, affecting the quality education. Therefore, attention must be paid on top priority to create adequate number of teaching posts and steps should be initiated to appoint on permanent basis the teachers who possess competency. The number of hours of teaching IT components in LIS departments needs to be increased noticing the expectations of the employer and the requirements of practical situation in libraries. Presently, 67.71% of the LIS teachers are handling IT related papers. This percentage is going to increase gradually in the future as emphasis has been given to the study of IT related library services over the last one and a half decades.
As regards the training requirement of teachers who handle IT related papers, 81.8% of the department heads opine that the LIS teachers need training / orientation of long duration so as to adequately learn and become familiar with the Information Technology aspects to be taught in theory and practical classes.

Basically, it is the faculty who deliver quality education and training in LIS departments. The knowledge and skills of teachers, comprehensiveness of the subject covered, interaction with students, regularity in teaching, systematic presentation of the subject contents, communication skill, including the method followed and teaching aids used are the criteria which determine the quality of teaching. Now-a-days, institutions are expected to adopt quality procedures and standards, by undergoing quality assessment, periodically. From the ultimate analysis, the LIS departments are expected to create “customer delight”- going beyond the expectations of the LIS students and parents (stake holders) and create delight among the customers.

In order to depict continual improvement in the teaching performance and development of IT infrastructure, several quality procedures identified by ISO 9001:2008 standards can be adopted, so that periodically there will be,

1. Monitoring of procedures being followed in accordance with the quality manual
2. Determining or assessing the level of performance and the demerits through the feed-back reports obtained from the students.
3. Application of corrective measures and preventive measures, as and when deviations or mistakes are identified in the system.
4. The rectification or corrective measures be effected to the lapses and mistakes identified in the facilities provided in the LIS department and also in the teaching programme, including the support services such as, library facilities, course-ware, maintenance of labs and equipment.