CHAPTER – VII

FINDINGS AND CONCLUSION
7.0 Introduction

Academic libraries are the nerve centers of their institutions and must support teaching, research, and other academic programs (Thanuskodi, 2009). These play a pivotal role in teaching and learning environment of the information society. Regarding information explosion, users’ new expectations in acquiring the needed information has made libraries and librarians to change rapidly. Today, development in computing and telecommunications has made it possible for the library staff to provide their users with a wide range of text, image and sound resources from around the world. Use of electronic media has brought many changes to the way libraries collect, store, retrieve, disseminate information and serve their users. With the help of different electronic resources such as e-books, e-journals, etc. academic libraries fulfill information needs of their users.

Now, e-journals have been regarded as important library resources and many libraries all over the world have already replaced print journals with e-journals (Islam and Chowdhury, 2006). According to Patra (2006), e-journals are an established component in the life of academic and research institutions. E-journals are becoming popular and more effective with the growth and expansion of the Internet (Islam and Chowdhury, 2006). Consequently, librarians obviously are interested in electronic journals as means of providing information to their customers.

Shrinking budget of libraries, new modes and formats of information products and services contribute to the confusion and uncertainty expressed by librarians attempting to provide the best to their users.

Hence, understanding the use pattern of e-journals helps the librarians to make the best purchasing decisions for their institutions and know what strategies can be employed to increase accessibility and usage of e-journals. In addition, it would also help to identify factors which need to be considered by publishers of electronic journals to improve services and contents to best serve both users and authors. A review of literature revealed that there has been little research done on the use of e-journals in Iran. Moreover, there is dearth of a comprehensive study in this field. Furthermore, the study coverage of the previous studies in Iran is very limited and none of them studied all of the variables
together like the present study. Having this in mind, carrying out the user studies in a broad range in Iranian universities such as the present study seems necessary.

### 7.1 Issues Studied and Analysed

The research conducted a study on the use of e-journals at top ten university libraries by research scholars. The important issues studied and analysed by the researcher include, extent of e-journals accessibility at university libraries in Iran, awareness and familiarity with e-journals, access and use of e-journals, reading pattern of e-journals, advantages and disadvantages of e-journals from the research scholars' point of view, satisfaction with subscribed e-journals, importance of e-journals, dependency on usage of electronic and print journals, format preference of journals, problems while accessing and using e-journals, and necessity of users' training for effective use of e-journals.

### 7.2 Methodology Adopted

For the purpose of data collection, a well structured questionnaire was designed and administrated randomly to the 1,705 research scholars in person and 1,150 questionnaires were returned of which 1,087 were useable giving a response rate of 64%. Furthermore, a total of 1,263 e-mails were sent and totally 293 responses were received (from the first e-mail and reminders) giving 23% response rate. Overall, 1,380 useable questionnaires were obtained. Further, informal interview was done with the research scholars to ensure clarity and authority of data. The stratified random sampling technique was used in administrating questionnaire and interview with the research scholars. The filled questionnaires were organized, coded and analysed. They were interpreted in the light of the objectives and hypotheses stated in the first chapter. In analysing and interpreting the data, different statistical measures like Frequency, Percentage, Mean, Standard deviation, $\chi^2$ (Chi-square) test, Independent-Samples t-test, Paired-Samples t-test and analysis of variance (ANOVA) were utilised. Tables, charts and graphs were used to make the presentation clear and simple.

While detailed study and interpretation of data was presented in chapter 5 and 6, the summary of findings is listed in succeeding sections.
7.3 Summary of Findings

7.3.1 Extent of E-Journals Accessibility at University Libraries in Iran

1. There are forty-nine (49) public, non-medical universities affiliated to Ministry of Science, Research and Technology (MSRT) in Iran. Of 49 university libraries, 45 (92%) libraries have access to e-journals while, 4 (8%) do not (Table 8). Out of four universities which don’t provide access to e-journals, only one university offer Ph.D. program in one subject.

7.3.2 Research Scholars’ Awareness and Familiarity with E-Journals

2. The university libraries of Iran in the present study provide access to e-journals through 'Consiran' consortium. A great majority of the research scholars (1359;98.47%) are aware of e-journals at their libraries, while, a small portion of them (21;1.52%) are not (Table 9).

3. It is observed that 'Friends' (35.73%) are the most important source through which the research scholars become aware of e-journals in their field. 'Internet' (29.62%) is the second most sought after factor by the research scholars to become aware of e-journals, followed respectively by the 'Internet' (29.62%), 'Teachers/Guide' (14.44%) and 'Library Professional Staff' (13.24%). Moreover, 'Colleagues' (6.93%) are the least preferred factor by the research scholars in becoming aware of e-journals. Furthermore, during interview, some respondents mentioned 'University Website' as a source of awareness of e-journals (Figure 9).

4. A vast majority of the research scholars (1358;98.4%) are familiar with the use of e-journals and a small segment of the research scholars (22;1.59%) are not (Table 10).

7.3.3 Access and Use of E-Journals

5. A remarkably high number of the research scholars (1338;96.95%) use the e-journals collection offered by their university libraries and a small segment of the research scholars (42;3.04%) do not. Therefore, 1338 research scholars are e-journal users and 42 research scholars are not (Table 11 and Table 12).
6. Data analysis regarding gender shows that the same percentage of male (97%) and female (97%) respondents are e-journal users (Table 12).

7. Analysis concerning discipline shows that the highest percentage of respondents that claim to be users of e-journals belong to the Engineering discipline (99.31%), followed by users of other disciplines as follows: Agriculture (97.63%), Basic Sciences (97.45%) and Humanities (92.32%) (Table 12).

8. Regarding age groups, all of the respondents that belong to age groups of 41-45 years and 46-50 years claim to be e-journal users. While, 99.62%, 97.12%, 96.20% and 95% of the respondents that belong to the age groups of 31-35 years, 21-25 years, 26-30 years and 36-40 are e-journal users respectively (Table 12).

9. The reasons for not using e-journals are ranked as follows: 'Prefer Paper Journals' (mean=3.55), 'Use other Resources for Information Needs' (mean=3.23), 'Access Difficulties' (mean=2.97), 'Lack of Time to Explore and Locate E-Journals' (mean=2.72), 'Lack of Sufficient Subscriptions in my Field' (mean=2.67) and 'Lack of Knowledge about E-journals' (mean=2.63). The remaining options are not reasons for not using e-journals by the research scholars including: 'Lack of skill in accessing and using e-journals' (mean=2.45), 'Inadequate Number of Computer Terminals' (mean=2.34), 'No Help Available in the Library' (mean=2.20), 'Inconvenient Working Hours of the Library' (mean=2.10) and 'Frequent Electricity Failures' (mean=1.29) (Table 13).

10. Elsevier (with a mean score of 3.85) is considered as the most popular publisher among the research scholars. Although Springer-Verlag (mean=2.80) and Wiley-Blackwell (mean=2.21) can be ranked as the second and third one, these two publishers and other publishers (having mean score less than 3) mentioned in the list can be considered as publishers/providers with few users. In other words, except Elsevier, other publishers or providers are not used sufficiently by the research scholars (Table 14).

11. More than one third of the research scholars (469;35.2%) use e-journals 'Thrice Weekly', followed by those who use e-journals 'Daily' (390;29.3%), 'Weekly'
Analysis of variance (ANOVA) shows that there is a significant difference among different disciplines regarding e-journal use (F value=27.409, df=3,1334, p=0.000<0.05) (hypothesis 1) (Table 16 and Table 17).

The research scholars belonging to Basic Sciences are known as the heaviest e-journal users (mean=5.02) followed by the research scholars belonging to other disciplines as follows: Engineering (mean=4.85), Agriculture (mean=4.77) and Humanities (mean=4.26).

Analysis of variance (ANOVA) shows that there is a significant difference among age groups regarding the frequency of e-journal use (F value=3.034, df=5,1326, p=0.01<0.05) (hypothesis 2) (Table 18 and Table 19). Regarding mean score the respondents in the age group of 26-30 years (mean=4.82) are the heaviest e-journal users while the respondents in the age group of 46-50 years (mean=4.00) are the lightest ones. The respondents in the age group of 21-25 years (mean=4.71) are ranked second, followed by the respondents in the age groups of 41-45 years (mean=4.64), 36-40 years (mean=4.59) and 31-35 years (mean=4.54), respectively.

Independent-Samples t-test shows that that males (mean=4.77) and females (mean=4.65) do not differ significantly regarding the frequency of e-journal use at the 0.05 level of significance (t=1.62, df=1330, p=0.103>0.05) (hypothesis 3) (Table 20).

More than half of the respondents (758;57.99%) spend 'Less than 30 min' on access to e-journals, followed by those who spend '30-60 min' in this regard (358;27.39%). The other respondents are those who spend '1-2 Hours' (149;11.4%), '2-3 Hours' (32;2.44%) and 'More than 3 Hours' (10;0.76%) on access to e-journals (Table 21).
In order to test whether the time spent on access to e-journals has any association with frequency of e-journal use, $\chi^2$ (Chi-square) test was conducted for 20 degrees of freedom at 0.05 level of significance. The test shows that there is a significant relationship between the time spent on access to e-journals and the frequency of e-journal use ($\chi^2$ value=1.072, $p=0.000<0.05$) (hypothesis 4) (Table 22). It means that the research scholars who spend less time on access to e-journals use e-journals more frequently than the others.

The time spent on browsing or searching the article varies from 'Less than 30 min' to 'More than 3 hours'. About 239 (18.14%) devote 'Less than 30 min' on browsing or searching the article of e-journals, 427 (32.42%) '30-60 min', 416 (31.58%) '1-2 Hours', 151 (11.46%) '2-3 Hours', and 84 (6.37%) 'More than 3 Hours' (Table 21).

The time spent on downloading the article varies from 'Less than 30 min' to 'More than 3 hours'. About 536 (40.7%) respondents spend 'Less than 30 min' on downloading the article. About one third of the respondents (430;32.7%) spend '30-60 min' in this regard, followed by those who devote '1-2 Hours' (242;18.4%), '2-3 Hours' (74;5.6%), and 'More than 3 Hours' (34;2.6%) on downloading the article (Table 21).

A large segment of the respondents (1022;78.8%) spend 'Less than 30 min' on printing out the article, 210 (16.2%) '30-60 min', 47 (3.6%) '1-2 Hours', 16 (1.2%) '2-3 Hours', and 2 (0.2%) 'More than 3 Hours'. In other words, a considerable number of the respondents numbering 1022 (78.8%) spend 'Less than 30 min' on printing out the article whereas, a very low number of the respondents (65;5%) spend more than 1 hour in this regard (Table 21).

Time span of using e-journals varies from 'Less than 1 Year' to 'More than 5 Years'. About 27 respondents have used e-journals 'Less than 1 Year', representing 2% of the total respondents. Approximately 159 (12%) respondents have an experience '1-3 Years' in using e-journals. This is followed by 531 (40%)
and 613 (46%) respondents having 'More than 5 Years' and '3-5 Years' experience in using e-journals respectively (Figure 10).

22. Learning how to use e-journals differs among users. 'Self-study' is the first source to learn how to use e-journals among research scholars (699;35%). It is followed by the other ways of learning, respectively: 'Family/Friends' (501;25%), 'Teachers/Guide' (349;17%), 'Colleagues' (266;13%), 'Library Training/Orientation' (144;7%) and 'Formal Courses' (44;2%). In 'Other' option, some respondents mentioned 'Library/University Website' as a way of learning to use e-journals (Figure 11).

23. 'Research Needs' (mean=3.95) is the main purpose for using e-journals and 'Preparing Seminar/Conference Papers' (mean=3.27) and 'Finding Current/Old Literature' (mean=3.10) are ranked as the second and third in order, followed by 'Current/Up to Date Information' (mean=2.89) and 'Publications' (mean=2.72). Further, the six last options which have the mean score of less than 2.50 cannot be considered as purpose of using e-journals by the research scholars including 'Teaching' (mean=2.25), 'Career Development' (mean=2.24), 'Communication' (mean=1.79), 'Administration' (mean=1.38), 'Recreation' (mean=1.32) and 'Win Award' (mean=1.32) (Table 23).

24. 'Research Scholars' Room' (619;30.12%) is the most frequently used place for accessing and using e-journals. This option is followed by 'Dormitory' (440;21.41%), 'Computer Centre' (345;16.75%), 'Departmental Computer Labs' (192;9.34%), 'Office' (182;8.85%), 'Home' (120;5.83%), 'Central Library' (95;4.62%), 'Departmental Library' (44;2.14%) and other places (18;0.87%) (Figure 12).

25. It is seen that 'PDF' (mean=3.96) is the most popular format of using e-journals by the research scholars and other formats i.e., 'HTML' (mean=1.91), 'MS Word' (mean=1.68), 'Post Script' (mean=1.29), 'LaTex' (mean=1.17), 'ASCII' (mean=1.07), and 'SGML' (mean=1.07) are not popular among the research scholars (Table 24).
26. Use of header information i.e., 'Abstract' (mean=3.61) is the first used components of e-journals by the research scholars. It is followed by 'Full Text' (mean=3.56), 'References' (mean=2.95) and 'Table of Contents' (mean=2.77). Remaining option i.e., 'Alerting Services' (mean=1.80) having mean score of less than 2.50 cannot be considered as used component of e-journals (Table 25).

27. The most popular search method among the research scholars is 'Keyword' (1077;49%). The second desired option is 'Article Title' (610;27.7%). This search option is followed by 'Author' (384;17.43%), 'Journal Name' (119;5.40%), and 'ISSN' (12;0.54%) respectively. Since, a negligible number of the research scholars (0.54%) searched e-journals through 'ISSN', the least desired search option is 'ISSN' (Figure 13).

28. More than half of the research scholars (758;57.4%) evaluate their abilities to use e-journals as 'Good'. The second portion of the research scholars (297;22.5%) perceive their abilities to use e-journals as 'Expert', 232 (17.6%) 'Average', and 29 (2.2%) 'Below Average'. Only a negligible percentage of the research scholars (4;0.3%) are 'Beginner' in this regard. Thus a great majority of the research scholars (1055;80%) evaluate their abilities to use e-journals as 'Good' to 'Expert' (Figure 14).

7.3.4 Advantages and Disadvantages of E-Journals

29. There are several general features perceived as advantages of e-journals by the research scholars. They are ranked as: 'Currency (Up-to-date Information)' (mean=4.75), 'Searchability/Search Capabilities' (mean=4.58), 'Downloading Possibilities' (mean=4.35), 'Retrieval Possibilities' (mean=4.27), 'Full Text Retrieval' (mean=4.25), 'Convenience' (mean=4.15), 'Credibility' (mean=4.01), 'Accuracy' (mean=3.98), 'Link to Related Items' (mean=3.85), 'Hypertext Links' (mean=3.75) and 'Connecting People' (mean=3.48) (Table 26).

30. The advantages of the availability and accessibility of e-journals perceived by the research scholars are ranked as: 'Prompt Accessibility' (mean=4.45), 'Free Access' (mean=4.06), 'Desktop Availability' (mean=3.90), 'Multiuser Access' (mean=3.88)
and 'Depending on Network (mean=3.06) (Table 27).

31. The disadvantages of e-journal availability and accessibility are ranked as: 'Long-term Access Unsolved (Archiving)' (mean=2.25), 'Requiring Log in Process' (mean=2.36), 'Requiring Special Equipment' (mean=2.79) and 'Requiring Training' (mean=2.96) (Table 27).

32. The advantages of browsing e-journals are ranked as per the mean values against each option such as: 'User-Friendly Interface' (mean=4.08), 'Technological Possibilities (animation, video, etc.)' (mean=3.77), 'Reading on Monitor' (mean=3.61) and 'Graphic Quality' (mean=3.60) (Table 28). The drawback of browsing e-journals is 'Lack of Standardised Format' with a mean score of 2.59 (Table 28).

7.3.5 Satisfaction with Subscribed E-Journals

33. Large number of research scholars (725;56.2%) opine that their required e-journals are subscribed at the respective library 'To Some Extent'. The second largest segment of the respondents (314;24.3%) say that their required e-journals are subscribed at the respective library 'To a Little Extent'. There are 231 (17.9%) respondents who state that their required e-journals are subscribed at the respective library 'To a Great Extent' whereas, only 20 (1.6%) respondents state 'Not at All' in this respect. Thus a large number of the respondents (956;74.1%) are satisfied from 'Some' to 'A Great Extent' with the subscribed e-journals while only 334 (25.9%) respondents indicate that they are satisfied from 'Not at All' to 'A Little Extent' in this regard (Table 29).

34. Level of satisfaction from 'Satisfied' to 'Highly Satisfied' with subject coverage, number and back volumes of available e-journals at the university libraries by the research scholars are 51%, 35.5% and 26%, respectively. Further, level of satisfaction from 'Moderately Satisfied' to 'Highly Satisfied' with the subject coverage, number and back volumes of available e-journals at the university libraries are 82.5%, 73.5% and 58.7%, respectively (Table 30).
35. The Paired-Samples t-test at the 0.05 level of significance shows that there are statistically significant differences between research scholars' personal satisfaction with subject coverage, number and back volumes of e-journals (hypothesis 5) (Table 31 and Table 32).

36. There is a statistically significant difference in satisfaction with subject coverage (mean=3.47) compared to the satisfaction with number of available e-journals (mean=3.11) (t=15.778, df=1300, p=0.000<0.05) (Table 31 and Table 32).

37. There is a statistically significant difference in satisfaction with subject coverage (mean=3.47) compared to the satisfaction with back volumes of available e-journals (mean=2.74) (t=21.388, df=1296, p=0.000<0.05) (Table 31 and Table 32).

38. Differences between satisfaction with number (mean=3.11) and satisfaction with back volumes of available e-journals (mean=2.74) is statistically significant (t=12.676, df=1296, p=0.000<0.05) (Table 31 and Table 32).

39. The research scholars are firstly satisfied with subject coverage (mean=3.47), secondly with number (mean=3.11) and thirdly with back volumes (mean=2.74) of available e-journals (Table 31).

40. More than half of the research scholars (758;58.4%) opine that available e-journals meet their information needs 'To a Moderate Extent'. 335 (25.8%) respondents state that available e-journals meet their information needs 'To a Great Extent' while, 5 (0.4%) respondents feel that e-journals do not meet their information needs at all. Further, 200 (15.4%) respondents indicate that e-journals meet their information needs 'To a Little Extent'. Thus available e-journals meet information needs of the vast majority of the respondents (1093;84.2%) from 'Moderate' 'To a Great Extent' (Table 33).

41. More than half of the respondents (658;50.7%) are 'Satisfied' and the second largest segment of the respondents (283;21.8%) are 'Moderately Satisfied' with using e-journals. Moreover, 243 (18.7%) are 'Extremely Satisfied' while only a
very small number of them (13.1%) are not satisfied at all. Further, a small number (101;7.8%) of the respondents are 'Slightly Satisfied' with using e-journals. Thus a vast majority of the respondents (1184;91.2%) are satisfied from 'Moderately' to 'Extremely' with using e-journals (Table 34).

42. A good number of the research scholars (742;57.3%) evaluate infrastructure facilities at the respective university libraries for accessing and using e-journal as being adequate to a 'Moderate Extent'. Further, 243 (18.8%) respondents state that infrastructure facilities at their university libraries are adequate to a 'Great Extent' whereas, only a small number of the respondents evaluate the facilities either 'Not at All' (86;6.6%) or to a 'Little Extent' (224;17.3%) adequate in this regard. Thus, a remarkably large number of the respondents (958;76.1%) evaluate adequacy of infrastructure facilities at the respective university libraries to access and use e-journals from a 'Moderate Extent' to a 'Great Extent' (Table 35).

7.3.6 Importance of E-Journals

43. A great majority of the research scholars (1204;92.8%) perceive e-journals as 'Highly Important' for their research while none of them has rated e-journals as 'Not Important' for research. Further, only 7 (0.5%) respondents consider e-journals as 'Slightly Important' and 86 (6.6%) as 'Important' for research activities. Thus almost all of the respondents (1290;99.4%) rank e-journals from 'Important' to 'Highly Important' for research activities. It means that almost all research scholars perceive e-journals as an important information resource for their research activities (Table 36).

44. More than half of the research scholars (706;54.5%) evaluate e-journals information contents as 'Excellent'. It is followed by 529 (40.8%) respondents who rate e-journals information contents as 'Good', and 61 (4.7%) state as 'Fair'. None of them has evaluated e-journal information contents as 'Poor' or 'Not at All Useful'. Thus, a vast majority of the respondents (1235;95.3%) rate e-journals as being 'Good' to 'Excellent' (Figure 15).
7.3.7 Dependency on Usage of Electronic and Print Journals

45. A good number of the respondents (547; 42.1%) are dependent on 'print journals' 'To a Little Extent'. The second largest segment of the respondents (312;24%) have dependency on print journals to 'Some Extent'. In addition, those respondents who are dependent on print journals ' To a Middle Extent ' are 190 (14.6%). Further, there are only 90 respondents representing 6.9% who are dependent on print journals ' To a Great Extent ' (Table 37).

46. More than half of the respondents (666;51.1%) are dependent on 'e-journals' to a 'Great Extent' whereas, there are just 45 respondents representing 3.5% who are dependent on e-journals to a 'Little Extent'. Moreover, the second largest portion of the respondents (486;37.3%) are dependent on e-journals to a 'Middle Extent'. There are only 106 (8.1%) respondents who are dependent on e-journals to 'Some Extent'. Further, none of them has reported 'Not at All' dependency on e-journals (Table 37).

47. The Paired-Samples t-test at the 0.05 level of significance shows that there is a significant difference between the extent of dependency on print (mean=2.61) compared to that of e-journals (mean=4.36) (t=41.639, df=1297, p=0.000<0.05) (hypothesis 6). It means that research scholars are more dependent on e-journals than print ones.

7.3.8 Format Preference of Journals

48. Regarding the statement, "I find e-journals to be equivalent to print journals", 358 (27.8%) research scholars perceive e-journals equivalent to print journals while, 581 (45.1%) research scholars do not. However, 27.1% are uncertain about this statement. $\chi^2$ test shows that there is a significant difference among research scholars regarding this statement ($\chi^2$ value=3.959, p=0.047<0.05) (Table 38). It means that research scholars do not find e-journals to be equivalent to print journals.

49. With regards to the statement, "If both print and electronic versions of journals are equally available, I would prefer to use the electronic one", more than of the
research scholars (772; 59.1%) prefer e-journals to print ones while, 325 (25.1%) research scholars do not. In addition, 15.8% are uncertain about this statement. $\chi^2$ test shows that there is a significant difference among research scholars regarding this statement ($\chi^2$ value=13.762, p= 0.000<0.05) (Table 38). It means that the research scholars significantly prefer e-journals to print ones.

50. Regarding the statement, "I support the transition from print to e-journals only", overall, 498 (38.7%) research scholars support transition from print to e-journals only whereas, 447 (34.7%) research scholars do not. Further, 341 (26.5%) research scholars have no idea. $\chi^2$ test shows that there is not a significant difference among research scholars regarding this statement ($\chi^2$ value=0.216, p=0.642>0.05) (Table 38). It means that the research scholars are uncertain about transition from print to e-journals only.

51. Independent-Samples t-test clearly shows that there is a significant difference between males and females regarding preference for electronic journals versus print ones (t=-3.782, df=506.269, p=0.000<0.05). It means that females (mean=3.79) more prefer electronic format versus print ones than males do (mean=3.48) (hypothesis 7).

52. $\chi^2$ test indicate that no significant relationship between age and preferences for electronic journals versus print ones is observed ($\chi^2$ value=28.426, df=20, p=0.100>0.05) (hypothesis 8).

53. Analysis of Variance (ANOVA) shows that there is a significant difference among disciplines regarding preference for electronic journals versus print ones (F value=2.745, df=3,1288, p=0.042<0.05) (hypothesis 9) (Table 39). All disciplines show a preference for electronic format. However, among the disciplines, Agriculture respondents (mean=3.79) have the most preference for electronic format, followed by the respondents belonging the other disciplines, respectively: Engineering (mean=3.58), Basic Sciences (mean=3.55) and Humanities (mean=3.41).
7.3.9 Reading Pattern of E-Journals

54. Nearly 615 (47.3%) respondents read electronic (on monitor) format 'Most Frequently', and 560 (43.1%) respondents read print out 'Most Frequently'. There are 564 (43.4%) respondents who read electronic format and 523 (40.3%) respondents who read print out format 'Frequently'. Furthermore, those respondents who read electronic format 'Occasionally' are 118 representing 9.1% of the total respondents. There are 211 (16.3%) respondents who read print out format 'Occasionally'. Equal number of the respondents (4;0.3%) 'Never' read electronic format and print out format (Table 40).

55. The Paired-Samples t-test at the 0.05 level of significance shows that there is a statistically significant difference between the research scholars’ personal preference of electronic (on monitor) versus print out reading (t=-3.245, df=1289, p=0.001<0.05) (hypothesis 10). Thus research scholars prefer electronic (on monitor) format (mean=3.37) over print out (mean=3.25) for reading.

56. More than half of the research scholars (708;54%) read 'Less than 5 Articles' in a week. Further, there are 430 research scholars who read '5-10 Articles' that they account for 32.5%. Furthermore, those research scholars who read '10-15 Articles' are 92 (7%) and the remaining 79 (6%) research scholars read 'More than 15 Articles' weekly. Thus a vast majority of respondents (1138;87%) read between one to ten articles every week (Figure 16).

57. $\chi^2$ test indicate that there is a significant relationship between the number of articles read and the frequency of e-journals use ($\chi^2$ value=3.604, df=115, p=0.000<0.05) (hypothesis 11). Thus, the research scholars who use e-journals more frequently tend to read more articles than the others (Table 41).

58. Nearly half of the research scholars (663;51%) spend 'More than 4 Hours', 330 (25%) spend '2-4 Hours', 236 (18%) spend '1-2 Hours' and only 77 (6%) devote 'Less than 1 Hour' on reading e-journal articles weekly (Figure 17).
59. $\chi^2$ test shows that there is a significant relationship between the time spent on reading and the frequency of e-journal use ($\chi^2$ value=4.676, df=15, p=0.000<0.05) (hypothesis 12). Thus, the research scholars who use e-journals more frequently spend more time on reading than the others (Table 42).

7.3.10 Problems of Accessing and Using E-Journals

60. The vast majority of the research scholars (1073;82%) face problems for accessing and using e-journals while, 236 (18%) research scholars do not have problems in this regard (Table 43).

61. Regarding problems of accessing and using e-journals, 'Poor Connectivity (Low Internet Speed)' (mean=3.48) is the main problem which is followed by 'Lack of Internet Facilities' (mean=2.98), and 'Lack of Well Organized Home Page of Library with Link to the E-journals' (mean=2.79). However, the remaining options which have a mean score of less than 2.50 cannot be considered as perceived problems by the research scholars during accessing and using e-journals, they are ranked as follows: 'Inadequate Number of Computer Terminals' (mean=2.46), 'Inconvenient Location' (mean=2.10), 'Lack of Training/Orientation' (mean=1.98), 'Lack of Assistant from Librarians' (mean=1.88), 'Inconvenient Timings of Library' (mean=1.84), 'Electricity Failure' (mean=1.59) and 'Poor Computer Use Skill' (mean=1.55) (Table 44).

62. In spite of the problems associated with the usage of e-journals, a majority of the research scholars (1261;98%) would recommend e-journals to other students, colleagues, friends, etc. while only a very small number of research scholars (27;2%) would not (Table 45).

7.3.11 Necessity of Skill Improvement for Using E-Journals

63. Most of the research scholars (942;75.5%) are of the opinion that they need to improve their skill to use e-journals and remaining (316;24.5%) opine that they do not (Table 46).
The majority of the research scholars (822;64.1%) opine that they need regular training/orientation for effectively accessing and using e-journals whereas, more than one third of the research scholars (461;35.9%) do not (Table 47).

It is observed that of 822 research scholars who need a regular training, a large number of them (800;97.32%) have preference for mode of training and a small number of them (22;2.67%) do not (Table 48).

'Online Help/ Online Tutorial' is the first preferred mode of training/orientation by more than one third of the research scholars (441;37.12%), 'Workshop/Seminar' is the second preferred mode of training/orientation (286;24.07%), followed by 'Informative Booklet' (145;12.2%), 'Informal Small Group Classes' (120;10.1%), 'Consulting Librarians' (103;8.67%), 'Library Training/Orientation' (66;5.55%), and 'Support when Needed' (27;2.27%) (Figure 18).

**7.4 Recommendations and Suggestions**

In the light of the findings of the study, as well as respondents’ feedback, the following suggestions are made. These suggestions improve the use of electronic resources, especially e-journals, among users to address the information needs and the users' satisfaction:

- A faster and more reliable Internet connection would increase the speed of download and decrease access time;
- More Internet facilities such as internet connectivity in dormitories and access to e-journals out of campus should be provided;
- More informative, user friendly and well organised university library website that makes easy access to the e-journals should be offered by the library;
- Appropriate infrastructures including computers, work stations, software, hardware, etc. are needed;
- More funds to increase the titles of e-journals subscribed, more access to back volumes of e-journals and e-journals from more publishers/providers should be assigned;
Promotion of on-screen help, holding workshops/seminars and preparing informative booklets, etc. to support users training on e-journals;

More marketing of library services and products such as publicising new and existing e-journals via the library's website, a bulletin board service for posting messages and announcements, etc.;

Implementing social networks such as Wikis, email, discussion groups, blogs, etc. to interact with friends, colleagues, etc. for learning how to use e-journals;

Identifying the non-users of e-journals and proper steps should be taken to convert them into potential users;

Converting non-users of e-journals into potential users through identifying them and taking appropriate steps.

Seeking teachers and students' opinions for e-journals subscriptions;

Omitting the tedious process of logging for accessing e-journals;

Uniform search interface for different e-journal publishers/providers should be provided.

### 7.5 Suggestions for Further Research

Based on the present study, the following areas are identified for further research.

The present study involved only research scholars belonging to four disciplines at top ten universities in Iran, future studies can concentrate on research scholars or other users belonging to other disciplines and other Iranian universities;

A comparative study could be done on research scholars in other Asian countries;

The same study can be done with different method such as transaction log for getting better picture of using e-journals by the research scholars;

The effect of e-journal usage on research scholars’ scientific output can be another area for the future study;

Studies on the use of electronic journals at regular intervals to enable better collection development on cost-effective basis should be conducted;

A longitudinal research is desirable so that the emerging pattern and trend could be further explored.
7.6 Conclusion

This study provided insight into the use pattern of e-journals by the research scholars belonging to four disciplines at top ten universities in Iran that has not been explored much by the researchers. Comprehensive information was obtained through a well-structured questionnaire and informal interview, which involved several aspects of e-journals usage such as awareness, purpose, reading pattern, dependency and so on. This research supports the general trend seen in the literature review, showing that as time passes e-journals are being increasingly adopted. The overall attitude towards the use of e-journals among research scholars was shown to be very positive. This was apparent in the high proportion of users, the high frequency of use and high importance accorded to e-journals.

Although the use of e-journals at Iranian universities under study is well-established, there is a need to increase the use of e-journals. The frequency of use might have been higher if other factors were desirable, for example, Internet speed or accessibility of e-journals from other places out of university campus. Further, the usage of these resources can be increased if users are motivated to use these services in the library by providing them help in searching and downloading the information.

This study supports the influence of variables determining users’ behavior (e.g., discipline, age and gender) in e-journal usage and preference for electronic format.

Another conclusion is that, a majority of the users are significantly dependent on e-journals over print ones for their research work. However, the users are uncertain about transition from print to e-journals only. Thus, the library should continue to provide e-journals along with print journals.

With regard to reading pattern, a screen-based reading behavior is emerging for reading electronic documents. Further, the number of articles read is increasing as compared with similar studies. In addition, research scholars at Iranian universities continue to read e-journal articles widely.

This survey has served as benchmark use of e-journals in Iranian universities. It is
hoped that the results of this study enable the Iranian university libraries to evaluate and realign resources and services according to users' requirements effectively.