5.1 Summary of Findings

The collected information has been put to analysis and the inferences have been drawn revealing the following spectrum of findings.

5.1.1. Engineering College faculties Personal details

1. All India Council for Technical Education (AICTE) qualified teaching faculty members who are all working in Coimbatore and Tiruppur district are used for this study. There are 972 faculties involved.

2. Among the total participants (972), 561(57.7) are males and 411(42.3) are female respondents.

3. It could be seen that out of the total respondents (972), 667(68.6), and 305(31.4) faculties qualifications are PG in engineering and PG in engineering with Ph.D in engineering qualified teaching faculty members.

4. Based on the age of the faculties, 362(37.2) are below 30 years, 246(25.3) are 31-40 years and 364(37.4) are above 40 years of age respectively.

5. 15.5 percent of the respondents have below 5 years of teaching experience in engineering colleges. Remaining, 32.5 percent of them having between 5 and 10 years, 28.9 percent of them have 11 and 15 years, 11.7 percent of them between 16 and 20 years and 11.3 percent of the respondents have above 20 years of experience in teaching and industries.

6. Designation of the faculty members are Assistant professor, Associate Professor, and professor. Among the total respondents (972), 37.1 percent of...
the respondents are assistant professors, 33.3 percent are associate professors and 29.5 percent are professors category.

7. Among the male (561) respondents, 41.9 percent of them are assistant professors, 34 percent of them are associate professors and 24.1 percent of them are professors category.

8. Among the female (411) respondents, 30.7 percent of the faculties are assistant professors, 33.3 percent of them are associate professors and 37 percent of them are professors.

9. Among the PG teaching faculties (667), 48.6 percent of them are assistant professors, 31.5 percent have associate professors and 19.9 percent have a designation of professors.

10. Among the Ph.D (305), qualified faculties, 12.4 percent, 37.4 percent and 50.5 percent of them are assistant professors, associate professors and professors.

11. 81 percent of the staff members are working in the university affiliated colleges and 19 percent of the staff members are university affiliated autonomous colleges staff members.

12. Based on the gender of the respondents, 86.8 percent and 13.2 percent of the male respondents are working in the university affiliated colleges and the autonomous colleges. 73 percent and 27 percent of the female respondents are working in the university affiliated colleges and the autonomous colleges.

13. Among the below 30 years, 75.1 percent are in the university affiliated college faculties and 24.9 percent are in the autonomous college staff members. 84.6 percent of the 31-40 years age categories are working in the university affiliated colleges and 15.4 percent are in the autonomous college staff. However, above 40 years of age, 84.3 percent are in the university affiliated
colleges and 15.7 percent are working in the autonomous college staff members.

14. 75.7 percent of the respondents are working as self-finance college staff members. 17 percent of the respondents are working in the government aided colleges and 7.3 percent of the respondents are working in the Government College.

5.1.2. Faculties Publication

15. Among the total respondents, 86.1 percent of the faculties published their research works less than 10 articles in national journals. 13.9 percent of them are published more than 10 articles in national journals.

16. Based on the educational qualification, 100 percent of the PG faculty members are published below 10 articles in the national journals. Among the Ph.D. qualified faculty members (305), 55.7 percent are published below 10 articles in the national journals and 44.3 percent of them published more than 10 articles in the national journals.

17. 90.1 percent of the respondents are published below 10 articles in the international journals. Remaining 9.9 percent of them are published above 10 articles in the international journals.

18. 100 percent of the PG faculties published below 10 articles in the international journals. Among the Ph.D. faculty (305), 68.5 percent are published below 10 articles and the remaining 31.5 percent of them published more than 10 articles in the international journals.

19. Teaching faculties designation-wise publication in the national journals are, 94.7 percent of the assistant professors, 100 percent of the associate professors, 59.6 percent of the professors published below 10 articles. 5.3
percent of the assistant professors, 40.4 percent of the professors published above 10 papers in the national journals.

20. Designation and international journal publications details are, 89.8 percent of the assistant professors, 100 percent of the associate professors and 79.4 percent of the professors are published below 10 articles in the international journals. 10.2 percent of the assistant professors and 20.6 percent of the professors published 10 to 19 articles in the international journals.

21. Among the assistant professor (361), 74.8 percent of the respondents are presented below 10 papers in the national conference. Remaining, 19.9 percent and 5.3 percent are presented 10-19 papers and above 20 papers presented in the national conferences. 100 percent of the associate professors are presented below 10 papers. 46.3 percent of the professors presented below 10 papers in the national conferences. 53.7 percent are presented in 10-19 papers in the national conferences.

22. All the PG and Ph.D. respondents’ are presented below 10 papers in international conferences.

5.1.3 Frequency of Library Visits

23. Among the total sample (972), 58.2 percent of the respondents’ are visited the library daily. 28.4 percent are visited weekly once and 13.4 percent of them are visited fortnightly.

24. Among the male respondents (561), 50.4 percent of them are visited the library daily, 26.4 percent of the respondents’ are visited weekly once and 23.2 percent of them are visited fortnightly. Among the female (411), 68.9
percent of them are visited daily and 31.1 percent of them are visited weekly once.

25. Based on the educational qualification of the respondents, among the PG respondents (667), 50.5 percent of them are visited the library daily. 35.8 percent and 13.6 percent of them are visited weekly once and fortnightly. 75.1 percent of the Ph.D respondents are visited daily, 12.1 percent and 12.8 percent of them are visited weekly once and fortnightly.

26. 29.9 percent of the assistant professors are visited the library weekly once. 50.1 percent and 19.9 percent of them are visited weekly once and fortnightly.

27. Among the associate professors (324), 88.3 percent of them are visited daily and 11.7 percent of them are visited the library at least weekly once.

28. 59.9 percent of the professors are visited the library daily, 19.9 percent and 20.2 percent of them are visited weekly once and fortnightly.

29. Significant is observed from the teaching faculty member’s gender, educational qualification, designation, experience, age and their frequency of library visits.

5.1.4. Purpose of Library Visits

30. 100 percent of the faculty members visited the library for the purpose of borrowing books and update their subject knowledge. Consulting reference sources, accessing internet/online database, preparing their regular classes, research works, and writing research papers are in the decreasing rank among the members purpose of library visits.

31. There is no significant difference between the educational qualification, designation of the teaching staff members in the engineering colleges and their
following purposes, borrowing books, update the subject up-to-date, and use of CD ROM data base.

32. However, significant is observed between the following purposes, consulting reference sources, access of internet/online database, preparing classes, preparing competitive exams, relax/refreshing mind, research works, writing research papers, Xerox and educational qualification, designation of the respondents.

5.1.5. Often using the E-sources

33. Among the total sample (972), 61.6 percent of respondents are using the e-sources daily, 7.7 percent of them used twice a week, 23.7 percent of them used weekly once, 3.5 percent of them used the e-sources fortnightly and occasionally.

34. There is no significant difference between the gender, educational qualification, affiliation of the college, status of the college of the respondents and often use of the e-sources.

35. There is a significant difference between the respondents’ age, experience, designation and often using the e-sources. Significant sets are as follows,

- Based on age of the respondents, above 40 years > 31-40 years > below 30 years.
- Based on the experience of the respondents, 11-15yrs > above 20 yrs > below 5 yrs > 16-20 yrs > 5-10 yrs.
- Based on the designation, professor> assistant professor > associate professor.
36. Based on age of the respondents, below 30 years and above 40 years have significant difference.

37. Below 5 years, above 20 years, and 11-15 years experienced respondents’ doesn’t have any significant difference. Similarly, 16-20 years and below 5 years experienced respondents’ does not have significant difference. 5-10 years form a set. Significant is between these three groups.

38. Based on the designation, there is no significant difference between the assistant professor and associate professors often use of the e-sources. It is a set-1. Professor is another set-2. The significant difference is between these two sets.

5.1.6. Priority, place and usage time of e-sources

39. Among the total respondents (972), first priority to use the e-books, e-journals, online databases, e-theses & reports percentages are as follows, 19.3, 15.3, 53.4 and 18.9.

40. 14.56 percent of the assistant professors, 29.63 percent of the associate professors and 19.34 percent of the professors are choosing first priority for the use of the e-books.

41. 14.96 percent of the assistant professors, 5.86 percent of the associate professors, and 26.48 percent of the professors are choosing first priority to the e-journals.

42. Among the assistant professors, 29.92 percent of them are given first priority to the e- journals and e-reports. None of the associate professors are given first priority to this source.
43. 64.82 percent of the assistant professors, 58.64 percent of the associate professors and 3.14 percent of the professors are chosen the first priority to the online database.

44. College library (42.5) and department itself (42) are two main convenient places for accesses of the e-resource. 15.5 percent of them are preferred home as a ideal place for access of e-sources.

5.1.7. Place to Access of E-sources

45. Among the total sample, 42.5 percent of the faculties are chosen library as a nodal centre for access of online source, 42 percent of them preferred department itself and 15.5 percent of them home as a choice to access of online sources.

46. Based on the educational qualification of the respondents, 47.4 percent of the PGs and 31.8 percent of the PhDs are chosen the college library as a right place to access of the e-sources. 36.6 percent of the PGs and 53.8 percent of the PhDs are chosen the department itself as a good for access of the-sources. However, 16 percent of the PG respondents and 14.4 percent of the PhD faculties are choice to access of the e-sources is at home.

47. 46.5 percent of the assistant professors are chosen the college library is a centre for access of the e-sources .37.4 percent and 16.4 percent of them choices are department itself and home.

48. Among the associate professors, 34.6 percent of them are access the e-sources at college library, 49.4 percent of them are chose the department and 16 percent of them are access at home.
49. Among the professors, 46.3 percent of them are access the e-sources at college library, 39.4 percent are access at department itself and 14.3 percent of their are choice is at home.

5.1.8. Experience in using the E-sources

50. 9.7 percent of the respondents are accessing the e-sources for less than one year. 17.3 percent of them are using one to two years. 26.9 percent of them are accessing two to three years. 34.4 percent of the respondents are using three to four years and 11.8 percent of them are having an experience to use of the e-sources above four years. More than 45 percent of the respondents have an experience in using thee-sources more than 3 years.

51. Based on the gender of the respondents, 10.5 percent and 13.6 percent of them are having more than 4 years of experience in using the e-sources.

52. PGs do not have more than 4 years of experience in using the e-sources. However, 37.7 percent of PhDs have more than 4 years.

53. Only 5 percent of the assistant professors have more than 4 years of experience in the use of online sources. Associate professors do not have more than 4 years of experience. 33.8 percent of professors have more than 4 years of an experience.

54. Based on the experience of the faculty member, 21.4 percent of the 11-15 years of experienced faculties, 11.4 percent of the 16-20 years experienced staff and 13.6 percent of the above 20 years of experienced faculties have more than 4 years of experience in using the online sources.
5.1.9. Convenient Time to Access the e-sources

55. Among the total respondents (972), nearly 40 percent of the respondents are accessing the e-sources between 12 noon to 2 PM as their convenient time. 21.6 percent of the respondents are accessing the e-resources convenient time is 2 PM to 4 PM. 17.4 percent of the respondents use 9 AM to 12 noon for accessing the e-sources. Respondents’ 4 PM to 6 PM as a convenient time to access of the e-sources percentage is 5.7. 15.6 percent of them are choosing after 8 PM as convenient time to access of the e-sources.

56. Significant difference is observed between the educational qualification of the respondents and their convenient time to access of the e-sources.

57. Among the total respondents (972), 11.5 percent of them are accessing the e-sources below 3 hrs. /week. 36.8 percent of them spent to access of the e-sources above 3hrs/week to below 6hours/week. Above 6 hrs. to 9 hrs./week accessing respondents’ percentage is 38.5. 13.2 percent of the respondents spent for e-sources access more than 9 hrs. /week.

58. There is no significant difference between the qualification of the respondents and their time spent/week for the accesses of e-sources.

5.1.10. Source to identify the e-sources

59. 86.8 percent of the faculties are browsing the e-sources directly from the website. 84.4 percent of them are using the books and journals are used to identify the relevant e-sources. Library staff members (79) are also one of the useful sources for identification of the e-sources. 77.2 percent of the other department staff members are also a useful to know about the e-sources. 69
percent of the department staff members’ also used to find out the e-sources. 65.2 percent of them say that training/orientations/courses are useful sources.

60. Among the PG respondents’ top three learning e-sources are, library staff (72.41), trial and error (66.57) methods and trainings (58.62). However, the Ph.D., qualified respondents learning methods are library staff (91.31), trainings (86.89) and department colleagues & friends (68.85).

61. 73.33 percent of the respondents are searching the information through websites directly. 73.25 percent of them used search engines for searching the online information.

62. 61.62 percent of the PGs and 100 percent of the PhDs are accessing the online information through library website. 75.11 percent of the PGs and 69.18 percent of the PhDs are using search engine for access of online information.

5.1.11. E-sources using methods

63. 65.12 percent of the respondents preferred the printout method to read the e-sources. 67.71 percent of the respondents read the information directly from the online. However, 56.07 percent of them are using the both (printout and online) methods for reading digital information. Only 9.05 percent of respondents use the printouts for reading the e-sources and 11.64 percent of respondents use to read the information through online directly.

64. 83.81 percent of the respondents are choosing the pdf file format is more preferred format to read the information.
5.1.12. **Purpose of using the e-resource**

65. Among the total respondents, 32.5 percent of the faculty members are using the e-sources for taking regular classes. 27.7 percent of the respondents are using the information for their Ph.D., works or Ph.D., guidance. 22.6 percent of them used for Research and Development purposes. 11.3 percent of them are using the e-sources for enrich their technical knowledge. 5.9 percent of them are using the digital information for their conference and paper publication works.

66. Significant is observed between the Educational qualification (PG & Ph.D.) of the faculties and their access of the e-sources for preparing conference & paper publication and R & D works. Remaining purposes for preparing classes, PhD works and enrich knowledge does not have any significant difference.

67. Designation of the respondents (Assistant professor, associate professor, and professor) have a significant difference with access of e-sources for preparing classes, conference & paper publication, R&D works, PhD works and enrich knowledge. Level of significance is 1 percent and 5 percent.

68. Experience of the respondents (< 5 yrs, 5-10 yrs, 11-15 yrs, 16-20 yrs, > 20 yrs) have a significant difference with access of e-sources for preparing classes, conference & paper publication, R&D works, PhD works and enrich knowledge. Level of significance is 1 percent and 5 percent.

5.1.13. **Level of Awareness and use of the e-sources.**

69. Among the total respondents, 44.9 percent of them are aware and use of the IEEE, 37.7 percent of them are aware but don’t use it and 17.5 percent of them are not aware about the e-sources.
70. 40.9 percentage of the respondents are aware and use the Wiley-Blackwell sources. 38.1 percent of the respondents are aware but don’t use it and 21 percentage of them are not aware of this online source.

71. 44.5 percentage of the total respondents’ are aware and use the ASME digital e-resource. 26.7 percent of them are aware but don’t use it. Remaining 28.7 percent of them are not having awareness about this source.

72. Among the total respondents (972), 44.8 percent of the respondents are aware and use the ASCE resources. 34.1 percent of them are aware only. They do not use it. 21.2 percent of them are not aware about this source.

73. 40.6 percent of the total respondents are aware about the McGraw-Hill source and use it for their purposes. 30.1 percent of them have awareness only but they do not use it. 29.2 percent of them are not having awareness about his sources.

74. 48.4 percent of them are aware and use the Elsevier sources. 22.8 percent of them have awareness but they do not use it, and 28.8 percent of them do not have this source awareness.

75. Among the total sample (972), 48.6 percent of the respondents have knowledge about the IETE online source database and use it for their need. 32.3 percent have awareness but do not use in their purposes. 19.1 percent of them do not have awareness about this source.

76. Out of (972), 48.4 percent of the respondents have awareness and use the ASTM sources. 29.1 percent of them have awareness and don’t use it and 22.5 percent of them do not have awareness.
77. 30.2 percent of the respondents are aware and use the J-Gate. 44.3 percent of them have awareness but do not use it and 25.4 percent of the respondents do not have awareness of this source.

78. DELNET is Indian government open source for online journals. 40.4 percent of the respondents have awareness and use this gateway for their information need. 36.9 percent of them have awareness but don’t use it. 22.6 percent of them do not have aware of this source.

79. Among the PGs 25.2 percent of them are aware and use this source. 52.5 percent of the respondents have awareness but they do not use. 22.3 percent of them are not aware about the source.

80. 21.1 percent of the total respondents have aware and uses the IEI 41.8 percent of the respondents are have aware and do not use it. 37.1 percent of them have awareness about the IEI sources.

81. 50.3 percent of the respondents have the IET source awareness and use for their needs. 29.1 percent of them have awareness only but they do not use it. 20.6 percent of the respondents do not have the awareness.

82. Among the total respondents 40.1 percent have awareness and use the NDL, 26.7 percent of them are aware only and 33.1 percent do not have awareness.

83. Among the AICTE recommended e-sources (J-Gate, ISO, and IEI) awareness and use and the faculty members’ educational qualification does not have any significant difference.

84. However, significant difference is observed between educational qualification of teaching faculty members in engineering colleges and their level of awareness and use of the following e-sources IEEE, Wiley Blackwell, ASME, ASCE, McGraw-Hill, Elsevier, IETE, ASTM, DELNET, IET, and NDL.

86. Experience is one of the influencing factors of the awareness and use the e-sources recommended by the AICTE.

87. There is a significant difference between the faculty members’ age and the following online e-sources, IEEE, Wiley Blackwell, ASME, ASCE, McGraw-Hill, Elsevier, IETE, ASTM, J-Gate, DELNET, ISO, IET and NDL.

88. Age of the respondents and their awareness and use of the IEI resources do not have a significant difference.

5.1.14. Satisfaction of Online Source

89. Gender of the faculty members and the satisfaction of the following e-sources IEEE, ASCE, McGraw-Hill, Elsevier, IETE, ASTM, DELNET, ISO have significant difference. E-sources, Wiley-Blackwell, ASME, J-Gate, IEI, IET, and National Digital Library do not have significant difference with gender of the respondents.

90. Significant difference is observed between the educational qualification of the engineering college faculty members and their satisfaction of the listed e-sources IEEE, Wiley Blackwell, ASME, ASCE, McGraw-Hill, Elsevier, IETE, ASTM, J-Gate, DELNET, ISO, IET and National Digital Library have significant difference. It is differ from IEI source.

91. There is a significant difference between the experiences of the engineering college faculty members and their satisfaction of the listed e-sources IEEE, Wiley Blackwell, ASME, ASCE, McGraw-Hill, Elsevier, IETE, ASTM,
J-Gate, DELNET, ISO, IEI, IET and National Digital library have significant difference.

5.1.15. Level of Awareness of open access e-sources

92. 40 percent of the faculty members have high level of awareness and 60 percent of them have medium level of awareness about the open access sources recommended by the AICTE.

5.1.16. Pros of the e-resource

93. Getting more information (90.5) in a single click is the top pros. It is more useful (70.8). Time is more saving while accessing the e-sources.

94. 67.8 percent of the respondents are preferred hard copy of the e-sources.

5.1.17. Problems

95. Top five problems faced by the faculty members while accessing the e-sources are as follows, over work load is top (70.1), information overload (67.8), lack of time (65.5), irrelevant information (65.2) and privacy problems (55.3).

5.1.18. Need of training

96. Among the total respondents (972), 19.9 percent of the respondents are strongly agreeing the need of the training about the e-sources and open sources. 43.9 percent of them are also agreeing that. 26.3 percent of the faculty members view is neither agree or disagree the need of the training. i.e., they are in neutral position. 2.7 percent of the faculty members are disagree the need of the training and 7.2 percent of them are strongly disagreeing the need of training.

97. 77.3 percent of the male respondents are agreeing the need of the training and 45.3 percent of the female faculties views are same for need of training.
98. Based on the below 30 years category, 73.4 percent of the faculties are agreeing the need of the E-sources and open sources accesses training. 15.37 percent are in neutral conditions. 10.5 percent of them are generally disagreeing the trainings.

99. Among the 31-40 years category (246), 56.9 percent them are agreed for need of training. 29.7 percent of them are in neutral and 13.4 percent of them are disagreeing. Similarly, 58.8 percent of the above 40 years category agrees the need of the E-sources and open sources training. 34.6 percent are in neutral and 6.5 percent are disagreeing the need of the E-sources and open sources training.

100. There is no statistical difference between the age of the respondent and their opinion about the need of the E-sources and open sources training.

101. 68.8 percent of PG is agreeing the need of training. 20.2 percent of them are in neutral condition. 10.9 percent of them are disagreeing the training concept. Similarly, 52.8 percent of the PhD qualified faculty members opinion about the training is accepted. 39.7 percent of them are in neutral. And 7.5 percent are not accepting the training.
5.2 Suggestions

Suggestions are given to the librarians, engineering professional associations and the government regarding the better utilization online resources for the betterment of engineering teaching and research in India.

5.2.1 Suggestions given to the Librarians

1. Digital information is more valuable. Library professionals may create more awareness about e-resources and its value to the faculty members in the engineering colleges.

2. Organise one week faculty development programme about the e-resources to the engineering faculties and it is compulsory for teaching faculties in engineering colleges, So that they may be aware of the recent trends in the online sources environment.

3. Educating the faculties in the hands on training in the digital environment.

4. Faculties must exhibit their research & development and techniques through conferences, publications, and guest lectures.

5. Faculty may be encouraged to publish their research and findings in the impact factor journals
5.2.2 Suggestions given to the Intuition of Engineers Associations

1. Engineering associations may organise hands on training to the faculties at regular intervals.

2. Associations may sponsor the faculties to visit the national important engineering institutional libraries and its functioning.
5.2.3 Suggestions given to the Government

1. The government may conduct a survey to identify the information literacy level of the engineering faculties and organize information literacy programs for various categories of teachers through NITTTR.

2. The government may give financial and manpower support to establish centralized information centers at each district headquarters.

3. The government can strengthen the Engineering Information Centers Institutions and Industry related in every district headquarters under free of cost.

4. The National Institute of Technical Teachers Training and Research (NITTTR) may organize information access training programs in all the district headquarters at regular intervals.
5.3 Further Studies

The present study may be extended to the following areas:

1. To find out the other zone engineering college faculty members awareness and use of the e-resources, open sources are recommended by the AICTE.
2. To find out the medical college teaching faculties awareness and use of the digital sources in Tamilnadu.
3. To organise a survey about the agriculture college faculties use of the digital, open sources in the digital environment.
4. To compare the engineering faculty members awareness and use of the digital resources with other professional courses like Medical, Siddha, Indian System of Medicine Practitioners, Agriculture, Animal Science, and Law Professional.