

Technology adoption at selected National Institute of Technology libraries of northern India: librarians' perception

Ajay Kumar Arora

Assistant Librarian, Panjab University, Chandigarh.

Email: akajayarora@outlook.com

and

Sanjeev Sharma

Assistant Professor, Dept. of Library & Information Science, Kurukshetra University,
Kurukshetra.

Email: sanju_sharma2004@rediffmail.com

Abstract

. The present article is a study to determine the perception of NIT Librarians' towards adoption of technology at selected NIT Libraries of Northern India. The study is based on questionnaire survey of the selected Librarians'. The article investigates the current use of technological tools and expertise levels of the librarians in using them. It also determines the perceived advantages and disadvantages of the technology as well as barrier factors which affects the adoption of technology at NIT Libraries. The result showed that the librarians are inclined towards technology and it is imperative to embrace change. However, hurdles like reliability of technology, unskilled staff and lack of adequate budget are making the delays in technology adoption in NIT Libraries

Keywords: Technology adoption; NIT libraries; Technological tools

Introduction

Today libraries are facing transition from traditional information resource provider to the service based digital information resource provider. The concept of library as a storehouse of knowledge is giving way to the concept based on development of library in a hybrid environment where the resources are either traditional or in electronic formats (Cholin and Karisiddappa, 2006). Information seekers are no longer confined to the walls of the library (Vinitha, 2006). Technology is rapidly becoming advanced to the point that hardly a day goes by when we are not engaged in some sort of interaction with technology. On a daily basis, most higher education students, faculty, educational administration, teachers and students in

K-12, and business workers, use computers or a smart device, such as a smart phone or iPad, to check Email, go online for course updates, or to actually engage in online courses. For most schools and businesses, computers are used all day in some manner (Waller, 2013). The concept of ICT has transformed the technical education also and has insisted for an effective library system, which integrates the use of latest information and communication technology in its functioning.

Literature review

Literature on the adoption of ICT at libraries and other related issues are given below.

Kwadzo (2015) performed a study on awareness and usage of electronic databases by Geography and Resource Development Information Studies graduate students in the University of Ghana. The study revealed that 96.9% students were aware of electronic databases and were making use of the databases for their studies and research. The study pointed that 68.8% students mentioned that their source of knowledge was their lecturers, whereas 62.5% mentioned that they came to know about e-databases from Library website. The majority of respondents (87.5%) were satisfied with the available electronic databases.

Castro, Manuel (2015) in his paper has figured that many technologies are influencing the engineering education. A global survey on engineering education technologies was conducted in which each participant was asked to prefer the three learning technologies that will most likely impact engineering education in future. Overall, 375 participants responded to the survey offering the current view of learning technologies in engineering education. The results demonstrated the preference in the following manner - e-learning platforms and architectures (9.69%) followed by 3D printing (8.36%) and E-books and digital libraries (8.18%), simulators (7.91%) and mobile and ubiquitous learning technologies (7.02%).

Husain, Shabahat and Nazim, Mohammad (2015) explained the potential use of different information and communication technologies (ICT) in academic libraries of India. They undertook 15 academic libraries in India, which have been involved in applying traditional solutions for the management of library functions and services. The study discovered that the use of ICT-based tools like web discovery tools, blogs, wikis, Real Simple Syndication feeds and social networking seems uncommon in academic libraries. Lack of training, skills,

resistance to change for potential benefits of ICT and outdated ICT infrastructure were found as the major barriers of ICT implementation in academic libraries. Therefore, academic libraries in India are still in the first stage of understanding the importance of ICTs in Libraries.

Sankari and Chinnasamy (2014) conducted a study to assess the influence of information communication technologies on the library professionals' professional development. It examined the ICT skills among librarians in engineering Colleges in Salem and Namakkal Districts of Tamil Nadu state. The analyses of the data represent the extent and the level of ICT skills gathered by the library staff of these institutions.

Awuor, Rabah and Makke (2013) investigated, with case study analysis, the challenges that hinder the adoption of ICT in libraries of higher institutions of learning in developing countries. Influx of ICT has changed the work of libraries and information centres as users' demand and expects better and efficient services i.e., electronic resources and databases. However, libraries in developing countries are experiencing a lot of barriers in adoption of ICT resulting from several factors but majorly inadequate funding and unskilled staff.

Statement of the problem

In India there are 31 National Institute of Technology. These are the foremost technical institutions in India, having the national importance, and are grooming global engineers. This study is an attempt to present an overview of Librarians' perception regarding adoption of technology at National Institute of Technology Libraries i.e. NIT Srinagar (NITS), Dr. B. R. Ambedkar NIT Jalandhar (NITJ) and NIT Kurukshetra (NITK).

All of the three NITs' were granted the status of Deemed University, and further in 2007, became Institute of National Importance by an Act of Parliament. NIT libraries are developing digital library spaces and, hence, the present study is envisaged to know the technology adoption perception of the NIT Librarians.

Objectives

The main objectives of the study were as under:

- 1.1 To study the levels of current use of technological tools at NIT libraries.
- 1.2 To study the levels of expertise of use of technological tools of NIT librarians'.
- 1.3 To determine the perceived advantages of technology use at NIT libraries.
- 1.4 To determine the perceived disadvantages of technology use at NIT libraries.
- 1.5 To determine the perceived factors affecting adoption of technology at NIT libraries.
- 1.6 To find out the perceived status of NIT libraries.

Methodology

The sample size was determined on a 10 percent sample size of the total NITs' i.e. 31 in numbers. Therefore, 3 NIT Librarians were chosen for the study. The study adopted the questionnaire tool, where the respective Librarians of the earlier mentioned NIT Libraries were contacted for collecting the data.

Analysis and interpretation

1.7 Level of current use of technological tools at NIT libraries

The Librarians' were asked to indicate, on a likert scale of 1-5 (Very often, Often, Sometimes, Rarely and Never), the level of current use of technology tools at NIT Libraries. It had been observed (fig. 1) that Word Processing softwares and search engines were used extensively by them with mean value $\bar{x} = 4$, $\sigma \pm 0$. Use of Powerpoint presentations was ranked second with mean value $\bar{x} = 3.67$, $\sigma \pm 0.58$ followed by video/audio conferencing with mean value $\bar{x} = 3.33$, $\sigma \pm 0.58$. While, use of graphics and database management had been ranked the lowest with mean value $\bar{x} = 1.33$, $\sigma \pm 0.58$.

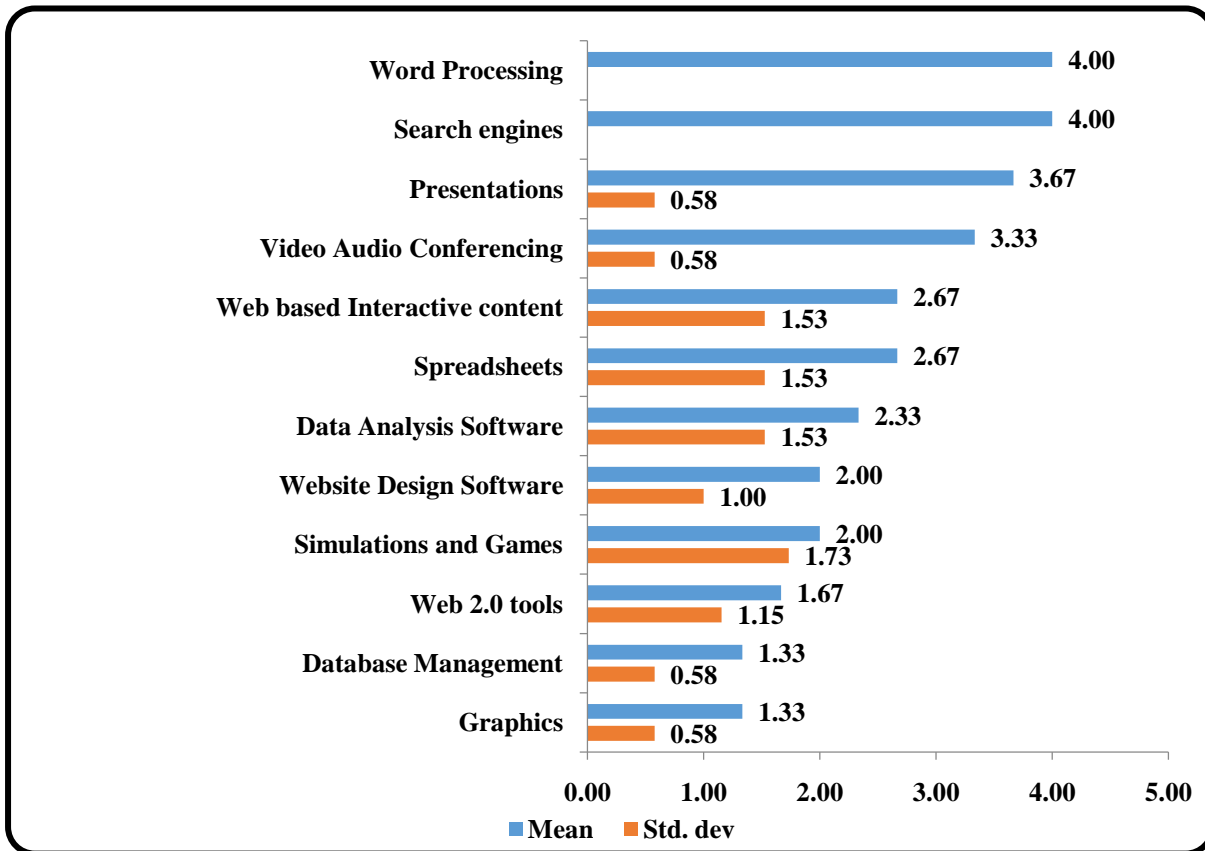


Figure 1: Level of Current Use of Technological Tools by the NIT Librarians'

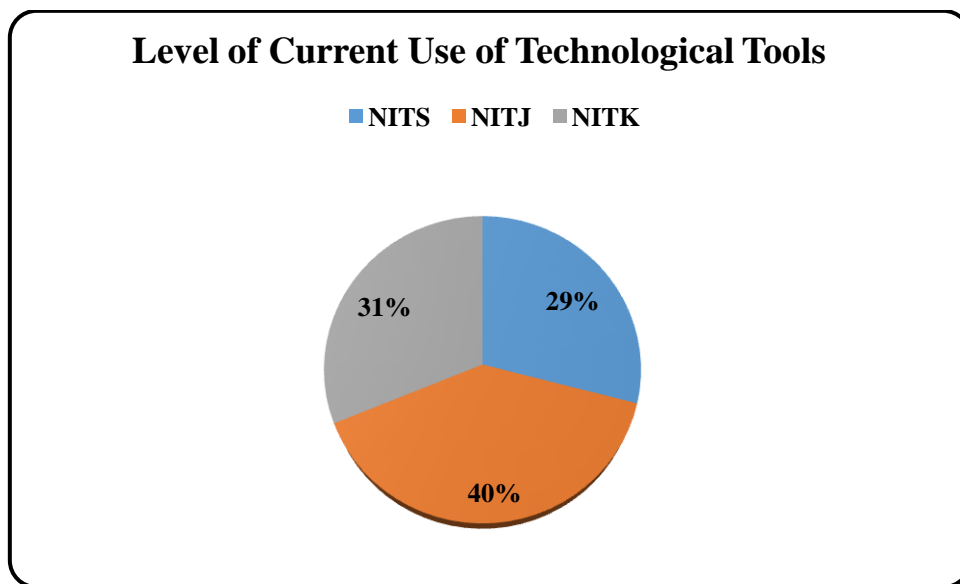


Figure 2: Inclusive Mean Values of Current Use of Technological Tools by the NIT Librarians'

It has been observed (fig. 2) that the levels of current use of technology at the selected NIT libraries, with reference to mean values, are that overall NIT Jalandhar is using 40% of the latest technology followed by NIT Kurukshetra with 31% and NIT Srinagar with 29%.

1.8 Level of expertise of use of technological tools

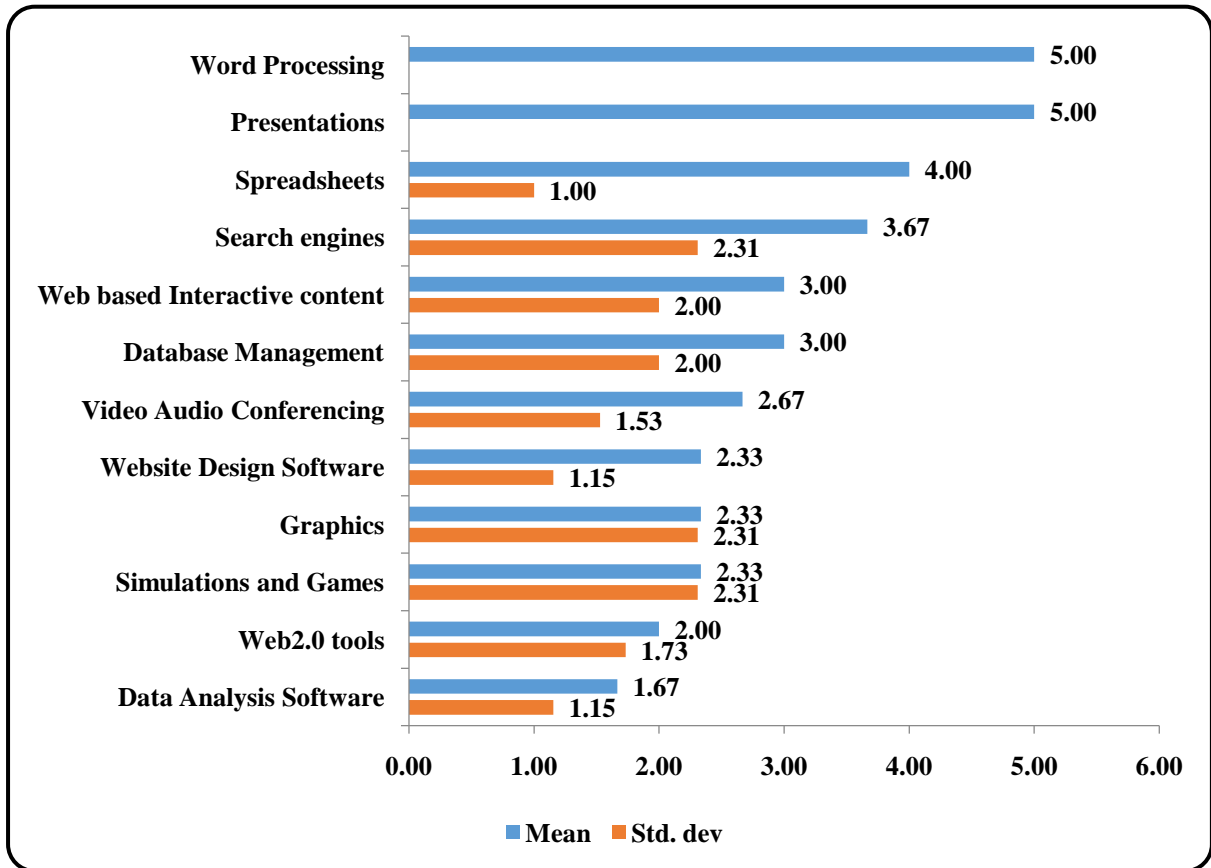


Figure 3: Level of Expertise of Use of Technological Tools by the NIT Librarians'

Figure 3 shows the level of expertise of librarians' with regard to technological tools. On a five point likert scale (Expert, Advanced, Intermediate, Beginner and No Experience), it was observed that word processing and PowerPoint presentations were used with full expertise with mean value $\bar{x} = 5$ followed by spread sheets with mean value $\bar{x} = 4$, $\sigma \pm 1$ and search engines with mean value $\bar{x} = 3.67$, $\sigma \pm 2.31$. Data Analysis Softwares and Web 2.0 tools were ranked the lowest with mean values $\bar{x} = 1.67$, $\sigma \pm 1.15$ and $\bar{x} = 2$, $\sigma \pm 1.73$, respectively.

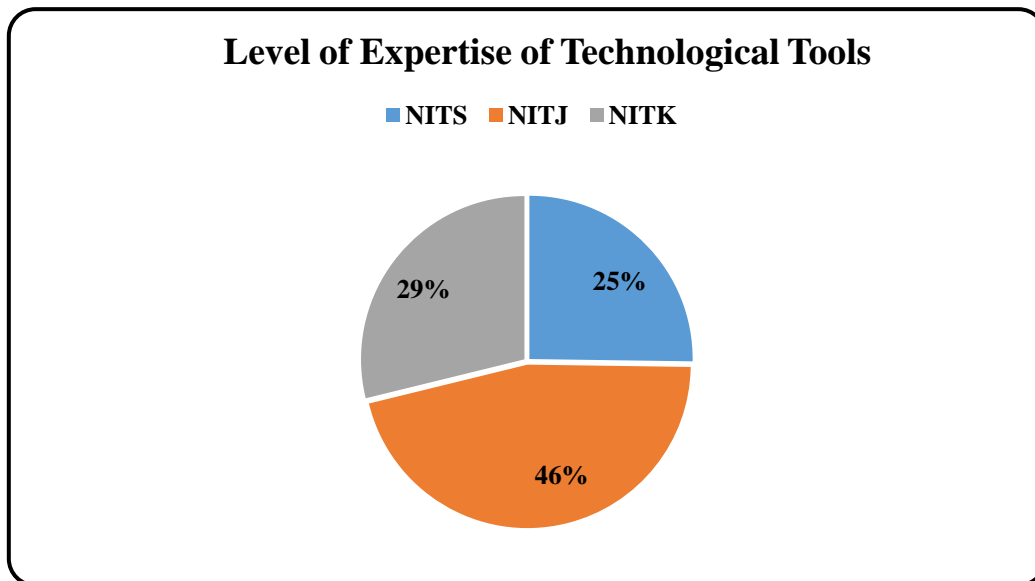


Figure 4: Inclusive Mean Values of Level of Expertise of Technological Tools by the NIT Librarians'

The inclusive mean value scores in fig. 4 shows that the NIT Jalandhar Librarian is using 46% technological tools followed by NIT Kurukshetra and NIT Srinagar Librarians with 29% and 25% expertise, respectively.

1.9 Perceived advantages of technology adoption

Librarians' were given statements in favour of their perception about technology adoption advantages in libraries. Five points likert scale was used (Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree) to mark the opinions. In Table 1 It has been observed that librarians' marked it unanimously the statements - to share library news/announcements; marketing of library services and resources; enhances library image among users and they can collect users' feedback in real time, each with mean value $\bar{x} = 4.67$, $\sigma \pm 0.58$. Fig. 5 shows inclusive mean value scores of perceived technology adoption of three NIT Librarians. NIT Srinagar Librarian had accounted the same with 40% followed by NIT Kurukshetra with 34% and NIT Jalandhar with 26%.

Table 1

Perceived Advantages of Technology Adoption

| Advantages of Technology Adoption | | Mean | Std. dev | Rank |
|-----------------------------------|---|------|----------|------|
| 1. | Effectively share library news/ announcements | 4.67 | 0.58 | 1 |
| 2. | Effectively market library services and resources | 4.67 | 0.58 | |
| 3. | Enhances library image among users | 4.67 | 0.58 | |

| Advantages of Technology Adoption | | Mean | Std. dev | Rank |
|-----------------------------------|--|------|----------|------|
| 4. | Easily solicit user’s feedback | 4.67 | 0.58 | |
| 5. | Use of new services that were not possible before | 4.33 | 0.58 | 2 |
| 6. | Improve students’ information literacy competencies | 4.33 | 0.58 | |
| 7. | Increases interaction between staff and users | 4.00 | 1.00 | 3 |
| 8. | Require little user training as most tools are user-friendly | 3.67 | 1.53 | 4 |
| 9. | Decrease user dependence on library staff | 3.33 | 2.08 | 5 |
| 10. | Are low cost or free | 3.33 | 2.08 | |

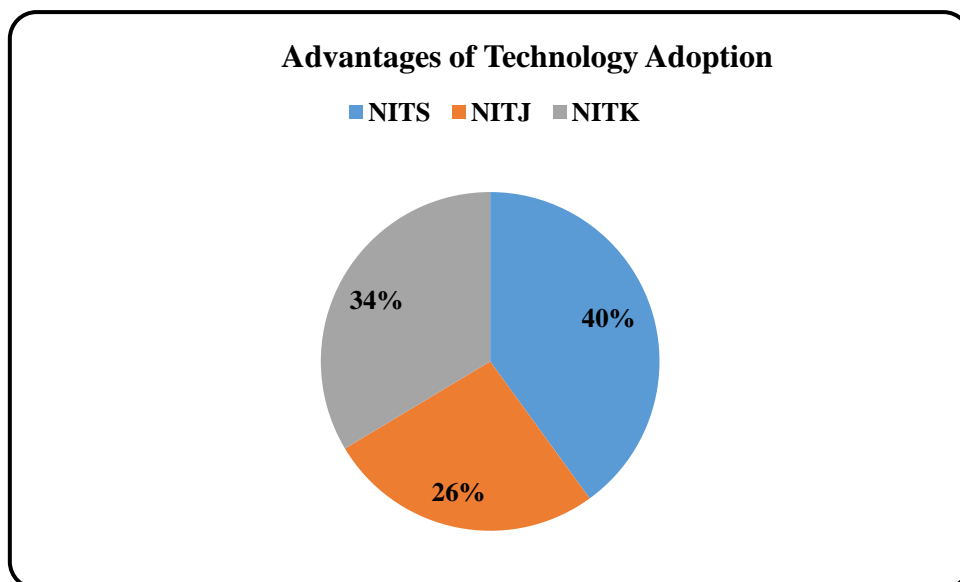


Figure 5: Inclusive Mean Values of Perceived Advantages of Technology

1.10 Disadvantages perceived by the librarians’ regarding technology adoption

Librarians’ were given statements in favour of their perception about technology adoption disadvantages in libraries. Five point likert scale was used (Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree) to mark the opinions. It was observed (table 2) that unanimously librarians’, with mean value $\bar{x} = 4$, $\sigma \pm 0$, were of the opinion that library became dependent upon IT centre and its staff. Lacking of special training skills among library staff is another disadvantage perceived by Librarians’ with mean value $\bar{x} = 3.67$, $\sigma \pm 0.58$ followed by lack in archiving/preserving shared contents and lack in standardization of

tools with mean value $\bar{x} = 3.33$, $\sigma \pm 0.58$. Breaches copyright law/licensing agreements has been marked the lowest with mean value $\bar{x} = 2$, $\sigma \pm 1.73$.

Table 2
 Perceived Disadvantages of Technology Adoption

| Disadvantages of Technology Adoption | Mean | Std. dev | Rank |
|---|------|----------|------|
| 1. Makes library dependent on staff and facilities of IT center | 4.00 | 0.00 | 1 |
| 2. Difficult to design and maintain as staff lack special training skills | 3.67 | 0.58 | 2 |
| 3. Lack in archiving/preserving shared contents | 3.33 | 0.58 | 3 |
| 4. Lack in standardization of tools | 3.33 | 0.58 | |
| 5. Provide unauthentic content/unreliable information | 3.00 | 1.73 | 4 |
| 6. Difficult to use as users lack awareness and training | 2.67 | 1.53 | 5 |
| 7. Requires high cost hardware/software | 2.67 | 1.15 | |
| 8. Create information overload | 2.67 | 1.53 | |
| 9. Carry legal implications | 2.33 | 1.53 | 6 |
| 10. Create threats to user privacy | 2.33 | 1.53 | |
| 11. Create threats to data security | 2.33 | 1.53 | |
| 12. Breaches copyright law/licensing agreements | 2.00 | 1.73 | 7 |

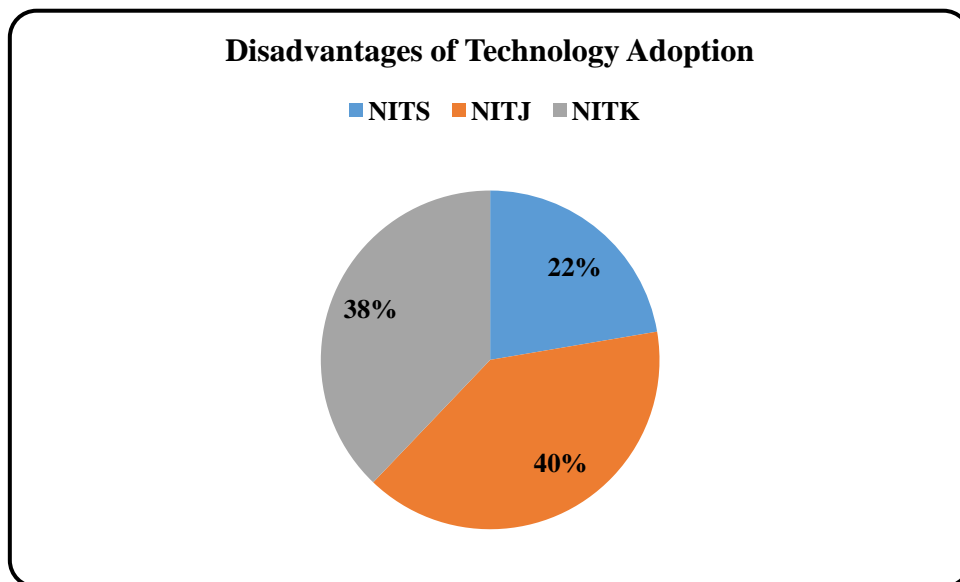


Figure 6: Inclusive Mean Values of Perceived Disadvantages of Technology Adoption

Fig. 6 shows composite mean value scores with NIT Jalandhar Librarian with 40% seems to be agreeing more with the disadvantages followed by NIT Kurukshetra with 38% and NIT Srinagar with 22%.

1.11 Perceived barrier factors affecting technology adoption in nit libraries

Librarians’ were undivided in mentioning the barrier factors affecting technology adoption in NIT Libraries. The scores were based on a four point likert scale (not important, somewhat important, important, very important). In table 3, the statements like – ‘skill level of librarians’, ‘reliability of the technology’, and ‘difficulty in using the technology’, were ranked the highest with mean value $\bar{x} = 2.67$, $\sigma \pm 0.58$ followed by statements like – ‘knowledge of technology use’ and ‘lack of adequate budget’ with mean value $\bar{x} = 2.33$, $\sigma \pm 0.58$. ‘Inadequate Existing Resources’ has been considered the least factor with mean value $\bar{x} = 1.67$, $\sigma \pm 0.58$.

Table 3:
 Perceived Barrier Factors Affecting Adoption of Technology

| Barriers | Mean | Std. dev | Rank |
|--|------|----------|------|
| 1. Skill level of academic librarians | 2.67 | 0.58 | 1 |
| 2. Reliability of the technology | 2.67 | 0.58 | |
| 3. Difficulty in using the technology | 2.67 | 0.58 | |
| 4. Knowledge of technology use | 2.33 | 0.58 | 2 |
| 5. Lack of adequate budget | 2.33 | 0.58 | |
| 6. Lack of ICT qualified staff | 2.33 | 1.15 | |
| 7. Lack of updated ICT strategy | 2.00 | 0.00 | 3 |
| 8. Academic librarians are reluctant to use ICT | 2.00 | 1.00 | |
| 9. Lack of commitment by institutional management | 2.00 | 0.00 | |
| 10. Erratic power supply | 2.00 | 1.00 | |
| 11. Difficulty in training the academic librarians | 2.00 | 1.00 | |
| 12. Inadequate existing ICT resources | 1.67 | 0.58 | 4 |

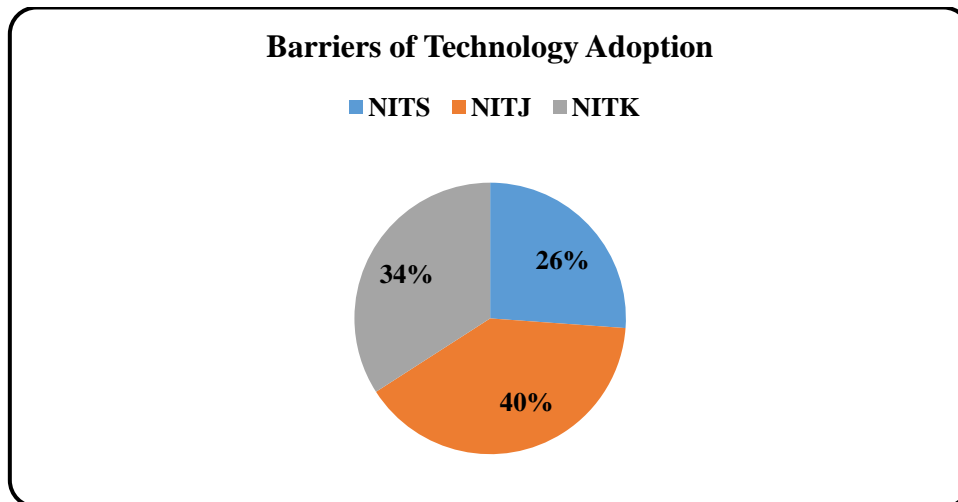


Figure 7: Inclusive Mean Values of Barrier Factors Affecting Technology Adoption

Fig. 7 shows the composite mean value scores of the librarians’ perception of barrier factors affecting technology adoption in NIT Libraries. It had placed the NIT Jalandhar in lead with 40% responses in favour of it followed by NIT Kurukshetra with 34% and NIT Srinagar with 26% perceived barrier factors.

1.12 Perceived library status

Librarians’ were asked about their perception about the status of NIT libraries. Four point likert scale was used to determine the perception through various parameters (very well, somewhat well, not very well, and not well at all). It had come to fore (table 4) that Librarians’ were unanimous on ‘friendly’, ‘up-to-date on technology’, comfortable’ and ‘innovative’ parameters and had chosen the same with the highest rank mean values $\bar{x} = 3.33$, $\sigma \pm 0.58$. ‘Inclusive’, ‘modern’ and dynamic has been given second ranking with mean values $\bar{x} = 3$, $\sigma \pm 0$. The Librarians’ admitted that the NIT Libraries are lacking in ‘highly skilled librarians’ and ‘offers different activities and environment’ with mean values $\bar{x} = 2.67$, $\sigma \pm 0.58$.

Table 4

Perceived Library Status

| Library Status | Mean | Std. dev | Rank |
|-----------------------------|------|----------|------|
| 1. Friendly | 3.33 | 0.58 | 1 |
| 2. Up-to-date on technology | 3.33 | 0.58 | |
| 3. Comfortable | 3.33 | 0.58 | |
| 4. Innovative | 3.33 | 0.58 | |
| 5. Inclusive | 3.00 | 0.00 | 2 |

| | | | |
|--|------|------|---|
| 6. Modern | 3.00 | 0.00 | |
| 7. Dynamic | 3.00 | 0.00 | |
| 8. Has highly-skilled librarians | 2.67 | 0.58 | 3 |
| 9. Offers different activities and entertainment | 2.67 | 0.58 | |

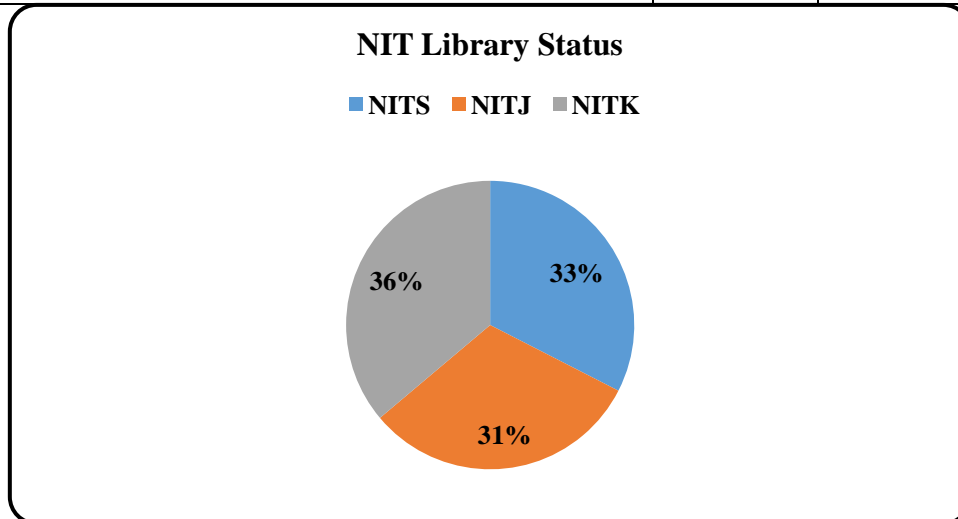


Figure 8: Inclusive Mean Values of Perceived Library Status

The inclusive mean value scores in fig. 8 shows that the NIT Kurukshetra Librarian perceives the library more inclusive, friendly and dynamic etc. With 36% responses in favour of it followed by NIT Srinagar with 33% and NIT Jalandhar with 31% affirmative responses.

Findings and suggestions

The findings and suggestions of the study can be summarized as follows:

1. Word processing and search engines are the most preferred technological tools being used by the NIT librarians. NIT Jalandhar Library has more inclination towards use of technological tools.
2. Librarians were found to be more expert in usage of Word processing software and powerpoint presentations tools. Surprisingly, data analysis software and web 2.0 tools were preferred the least.
3. NIT Librarians are found to be embracing the change and marked significant advantages in use of technology at NIT libraries. NIT Srinagar Librarian perceives more advantages in technology adoption in libraries.
4. Dependence on IT centre for smooth functioning of the libraries was one of the core issues bothering the Librarians. NIT Jalandhar Librarian perceived more

disadvantages with a marked emphasis that the technology ‘provides unauthentic content/unreliable information’.

5. Skill levels of library professionals, reliability of the technology and difficulty in using the technology had been marked as significant barrier factors in adoption of technology at NIT libraries. NIT Jalandhar Librarian faced more factors in adoption of technology.
6. Librarians’ require more support of their institution in terms of funds, technical support and human resources.
7. The more comfortable the library professionals become with technology, the sooner the technological learning tools will become predominant in NIT Libraries.
8. Technological transition is inevitable, more training programs of the staff, and subsequently of the stakeholders be organised for easy acceptance of technological tools.

Conclusion

ICT has a significant role in every sphere of life and libraries are not left behind from its impact. This study sought to examine the perception of NIT librarians with regard to use, advantages, disadvantages and barrier factors affecting technology adoption in NIT Libraries. It is evident from the study that NIT librarians are using technological tools yet they are unable to implement the same because of non-skilled staff, separate IT centre for handling connectivity issues and reliability issues of the technology. However, the Librarians’ mindset was positive in adopting the technology and it can be forecasted that the scenario can be altered by changing the resistance to change attitude of the NIT administration, by enhancing skill sets of the workforce and by introducing new technology at workplace.

References

Awuor, Fredrick Mzee, Kefah Rabah, and Benard Magara Maake. 2013. “Hindrances of ICT Adoption to Library Services in Higher Institution of Learning in Developing Countries.” *Computer Science and Information Technology* 1 (4): 252–56. doi:10.13189/csit.2013.010403.

Castro, Manuel. 2015. "ICT Needs and Trends in Engineering Education." In *Proceedings of 2015 International Conference on Interactive Collaborative Learning (ICL)*, 146–49.

Cholin, V S, and C R Karisiddappa. 2006. "Study of Design and Development of an Integrated University Library System in the Digital Environment." In *Fourth International Convention CALIBER-2006*, edited by T. A. V. Murthy. INFLIBNET.

Husain, Shabahat, and Mohammad Nazim. 2015. "Use of Different Information and Communication Technologies in Indian Academic Libraries." *Library Review* 64 (1/2). Emerald Group Publishing Limited: 135–53. doi:10.1108/LR-06-2014-0070.

Kwadzo, Gladys. 2015. "Awareness and Usage of Electronic Databases By Geography and Resource Development Information Studies Graduate Students in the University of Ghana." *Library Philosophy and Practice (e-Journal)*.

Sankari, R. Lakshmi, K. Chinnasamy. 2014. "ICT Skills among Librarians in Engineering Colleges in Salem and Namakkal Districts: A Study." *International Journal of Humanities and Social Science Invention* 3 (12): 9–17.

Vinitha, K., Kanthimathi, S. & Tharani Devi, K. 2006. Impact of Information and Communication Technology on Library and its Services, In *Proceeding of DRTC – ICT Conference on Digital Learning Environment* 11th –13th January 2006 DRTC, Bangalore. 1-7.

Waller, Darlene. 2013. "Current Advantages and Disadvantages of Using E-Textbooks in Texas Higher Education". *Focus on Colleges, Universities, and Schools* 7(1): 1-6.