Evidence Based Library and Information Practice

Research Article

Transforming Academic Libraries into Information Commons: A Proposed Model

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Received: 1 July 2021 **Accepted**: 25 Oct. 2021

DOI: 10.18438/eblip30004

Abstract

Objective – The main objective was to create an information commons (IC) model for the existing library with minimum structural changes to achieve maximum benefit. The subdivisions of the main objective were:

- to find out students' expectations and perceptions of an ideal learning environment;
- to find out the factors which influence the satisfaction level of the students for the library;
- to find out how satisfied are students from the existing library; and
- to find out the current library usage pattern of the students.

Methods – Based on the available literature on the topic, an online questionnaire survey was constructed with Google Forms and sent to current cohorts studying at the institute through e-mail, along with the study's rationale and a request for participation. We contacted 294 students, of which 199 responded. The data were analyzed and presented using Microsoft Excel.

Results – The findings of the study showed the keen interest of the students in library resources and services. It also showed that the students were not fully satisfied with the current library space and working hours. They wanted enhanced quiet areas and collaborative spaces where information experts help them use the current technology to improve their learning experience. Based on the gathered data analysis, an IC model for redesigning the existing library has been recommended.

Conclusion – The present study was the first step in research on ICs in the Indian context. This pilot study captured the perception and expectations of all levels of students: postgraduate, working executives, and senior-level executives. Most of the suggestions have been incorporated into the plan. With very few construction changes and new furniture, this model can be easily implemented in a small academic library without discarding the old furniture.

Introduction

The advancement of information technology and increased Internet use have significantly changed academic libraries' nature and students' information behaviour. The academic library has become an extension of the classroom, where students learn by collaborating. The students use the library not only for seeking information but also to socialize intellectually. Electronic resources have significantly increased in recent years, but faculty members continue to use both printed material and electronic resources. The library has become the centre of the intellectual community in an organization.

To make libraries more user-friendly, librarians in the United States (U.S.) conducted surveys on students' needs and expectations from libraries in their colleges and universities. After analyzing the surveys on users' preferences for library spaces and services, they could redesign their libraries. The users wanted a place to study using desktop and laptop computers with a wireless Internet connection. They needed a place for collaborative and group study with a lab for using multimedia and myriad software. They required a quiet area for serious research work. They wanted a seminar room with a projector and screen for lectures and presentations. They needed a cafe and a lounge for light refreshments and socializing. In a nutshell, the users perceived the library - a place away from home and classroom – as the third place: an information commons (IC).

According to Loertscher and Koachlin (2014), traditional libraries are resource-oriented, whereas ICs are learning-oriented. An IC aims to enhance student, faculty, and researcher learning, teaching, and research experience. The library’s physical space (the first level) with new arrangements, technologies, and services is the prominent feature to organize workspace and service delivery. It is a collaborative physical and virtual environment that invites and ignites participatory learning (Loertscher & Koachlin, 2014).

An IC is a virtual space at the second level, where students can search, access, and retrieve relevant information instantly for their studies and project work, and connect with other students, researchers, and faculty working in the same area. According to Beagle (2006): "a Virtual Commons is a pervasive

online environment in which a wide variety of electronic resources and services can be accessed through a single graphical user interface (GUI) and potentially searched in parallel with a single search engine from any networked workstation" (p. 4).

At the third level, IC becomes a Cultural Commons. At this third level are the social and cultural arenas of free speech, shared knowledge, and creative expression in the digital age, as in the surrounding envelope of laws, regulations, commercial practices, and popular traditions (Beagle, 2006).

Many universities and colleges in the U.S. and Europe have converted their libraries into ICs, and the students and faculty are using the IC for information sharing and knowledge creation. Other countries, such as Australia, China, Japan, and New Zealand, have also converted college and university libraries into ICs.

The Indian Institute of Management Lucknow

The Indian Institute of Management Lucknow (IIM Lucknow) is a leading management school in India, established by India's government as one of the four centres of excellence in Business Management Education. The first one was IIM Calcutta, which opened in 1961 in the east, The second was IIM Ahmedabad, which opened in 1961 in the west. The third, IIM Bangalore, opened in 1973 in the south, and the fourth, IIM Lucknow, opened in 1984 in the north. At present, there are 20 IIMs all over the country.

IIM Lucknow, spread over 200 acres of land, is beautifully surrounded by lush greenery and artistic landscaping. Three regular programs—Post Graduate Program (PGP), Post Graduate Program in Agri-Business Management (PGP-ABM) and Fellow Program in Management (FPM)—run from Lucknow Campus along with Management Development Programs (MDP).

Figure 1
IIM Lucknow campus.

The IIM Lucknow library, Gyanodaya, has a two-story building spread in 30,000 square feet. It holds 60,000 learning resources in different formats in management and related subjects.

Figure 2
The IIM Lucknow library.

In 2005, IIM Lucknow opened another campus at Noida (IIML Noida) to provide higher education to management executives who already work in the industry and wish to upgrade themselves. The major programs run by IIML Noida are a two-year Working Managers' Program (WMP), one-year International Program for Management Executives (IPMX), two-year Post Graduate Program in Sustainable Management (PGPSM), and four-year Executive Fellow Program in Management (EFPM). Various management development programs for corporates are also conducted throughout the year. The IIML Noida campus is spread over 20 acres of land (1/10th of the area of the Lucknow campus).

Figure 3
The IIML Noida campus.

The library is situated in the right wing of the second floor of the administrative block, with a floor space of 1,000 square meters. The library's learning resources include a print collection of around 6,500 books, 1,500 bound journals, 30 current journals, and electronic resources of around 500 e-databases, 1,500 e-journals, and 1,500 e-books. The library portal, **Gyanoday**, is accessible through the intranet.

Figure 4
The IIML Noida library.

Statement of the Problem

The libraries of higher education institutes in India are in a transition period. The decreased use of print resources and increased demand for online resources have compelled the librarians to adjust budgets accordingly. The library's declining footfall has impacted the justification for the size of the library workforce. The emphasis is now on skills: technology, media, and research. The librarians are trying to cope with the changes by upgrading their skills. Still, it is challenging to convince the administration to spend money on redesigning and revamping the libraries, let alone asking for a new IC building. Even the libraries' role in the students' overall learning and performance is not researched and documented correctly. Without accurate research data, librarians cannot justify the demand for skilled staff, the latest technology-based equipment, and library building or space renovation. In short, we can say that Indian libraries are facing the same problems which libraries in Western countries faced a couple of decades ago.

The present case study attempted to determine whether the needs, expectations, and perceptions of Indian students of higher education are different from or the same as their counterparts in other countries of the world. Based on the results, the authors have tried to convert the existing library space into a model of an IC, suitable for a small/medium academic library, that is low cost, requires minor structural modifications, and is in sync with the users' needs and expectations.

Scope and Limitations of the Study

We limited the study to only one institute because it is a pilot study. The authors have created a plan for space utilization of a small academic library based on the results. Other small academic libraries can utilize the findings of the research. Librarians can conduct similar studies for their institutes and make a stronger case with accurate research data for repurposing and reconstructing their institute libraries as ICs.

Literature Review

A detailed literature search was done to understand the concept of IC, what models are available, how they are planned and implemented in various institutes and universities, assessment techniques, the benefits of introducing IC in colleges and universities, and various case studies conducted by librarians.

The concept of IC came into existence in the mid-1990s. It was the time when librarians started using IC to improve library services. The rationale behind IC was to enhance student learning and scholarship. However, there was a need to create a rapport between the librarians and students and faculty.

Beagle (1999) has done significant work in the field of IC, developing the concept of IC at three levels: physical, virtual, and cultural (2006). Most colleges and universities in the U.S. have adopted Beagle's model in designing and developing their libraries.

Bailey and Tierney (2008) further developed the concept of ICs and learning commons (LCs) at four levels. The first two levels are ICs and the next two levels are LCs.

MacWhinnie (2003) called the library the third place for students, with the first place being home and the second place being the classroom. Students spent almost one-third of their time in libraries (MacWhinnie, 2003). Therefore, libraries should be inviting and comfortable.

McMullen (2008) emphasized analyzing students' needs before planning an IC on a campus. The library's space utilization, the technology used, and the library staff required in the IC should accord with the students' needs. Libraries work for improvement and to support the learning outcomes of the students. Therefore, their opinions matter the most.

Sinclair (2009) discussed the changing role of academic librarians due to increased technology use in libraries. This new role is focused not only on overall expertise, guidance, and instructions to students in using both offline and online information, but also on the institution's overall goals. The librarians must keep upgrading their skills according to the demands of the time.

Massis (2010) emphasized that libraries' new role has become a one-stop-shop for campus teaching and learning. The IC is full of students working in groups, discussing topics, and preparing projects. Compared to traditional libraries, the renovated or reconstructed ICs match the current teaching pedagogy, and the students find everything they need under one roof.

Peterson (2013) conducted a case study on the central library at a Midwestern U.S. university to determine its students' current usage behaviour, preferences, and expectations from the library. Results showed that students know what they want from a modern library. They still needed the quiet spaces provided in the traditional libraries, and they required group study spaces separately (Peterson, 2013). This case study affirmed that students required both individual and group study spaces.

Dryden and Goldstein (2013) discussed assessment models which may help evaluate LCs. They used various assessment methods like technology surveys, space assessment surveys, and focus groups. The assessment of ICs validated the need to spend time, effort, and money on library infrastructure and provided cost-benefit analysis data.

Woo et al. (2019) wrote about the impact of LCs on the students' learning behaviour and skills development. Their study was significant as it measured the impact of using an LC on students' learning and skills development, which is the primary goal of creating an IC.

The concept of IC is new to India. No significant research has been conducted, published, or documented related to IC for Indian libraries. Few practising librarians have written papers on either ICs or LCs. In one study, Singh (2019) compared the infrastructure, facilities, and services of Banaras Hindu University,

located at Varanasi, Uttar Pradesh, India, with an LC. The handful of articles on LCs presented in conferences and seminars in India are based on research conducted in Western countries and not on locally conducted research.

There are many differences between Indian and Western countries' socio-cultural values, economic conditions, and educational systems. In the West, institutes of higher learning for students are well maintained with good infrastructure. Even in the most ordinary universities, the library forms the centre of life for teachers and students. Librarians enjoy a high status as their contribution to academic life cuts across academic disciplines. They work closely with teachers and students in the various tasks involved in procuring books and journals, keeping the library quiet and friendly, and ensuring speedy access.

The Indian case is the opposite. The library exists on the margins of the classroom. In many universities, undergraduate students are not allowed to use the university library. Subscriptions to journals and magazines have dwindled over the years, and maintaining past volumes is now seen as an ancient practice because e-storage is available. The reading rooms carry an unkempt, hapless look, with noisy ceiling fans and worn-out books waiting to be removed. The faculty members also do not trust the librarians to help in teaching, learning, or research activities. There is always a lack of funds to spend on the library's infrastructure and skilled staff. With the indifferent attitude of the administration, librarians also do not take the initiative to improve their libraries. That is why there is a need to conduct and publish research-based studies in the Indian context.

Aims

In this study, our main aim was to create an IC model for an existing library with minimal structural changes to achieve maximum benefit. The subdivisions of the main aim were:

- to find out students' expectations and perceptions of an ideal learning environment;
- to find out the factors which influence the satisfaction level of the students for the library;
- to find out how satisfied are students from the existing library; and
- to find out the current library usage pattern of the students.

Methods

The Population

The Post Graduate course (PGPSM), Executive course (IPMX), and Working Managers course (WMP) students have comprised the target population for this pilot study.

Research Instrument

A structured online questionnaire was constructed using Google Forms to collect primary data (Appendix 1). It was sent to current cohorts studying at the institute through e-mail. Two hundred ninety-four students were contacted, of which one hundred ninety-nine responded. Likert's 5-point rating scale was used in most of the questions. The data were then analyzed and presented using Microsoft Excel.

Results, Analysis, and Discussion

The questionnaire had 17 questions. The first two questions were related to demographic data. Question numbers 3 to 7 were related to students' library usage patterns. Question numbers 8 to 10 were related to students' opinions about the quality of library services. The next four questions (11-14) captured the students' preferences for various library space features and furniture. The subsequent two questions (15-16) captured satisfaction and desirability levels for various library components. The last question was an open-ended question inviting suggestions to improve the library services or experience.

The captured data showed that the student needs and expectations differed course-wise. The IPMX, being a one-year course, was compact, and after attending classes for the whole day, the students used the library during the evening and night. The other course, WMP (two years' program), had working executives who resided on the campus for three days (Friday evening to Sunday evening), twice a month. They used the library only six days per month. All the IPMX and WMP students owned laptops, so they used the library for individual and group study. Another course, PGPSM, was a two-year residential course, where students were fresher, comparatively younger, and used the computers in the lab for accessing e-resources.

Demographic Data

A total of 199 students, out of 294 contacted, responded to the survey, or 67.69% of the total sample. The course-wise participation (in percentage) is given in Figure 5.

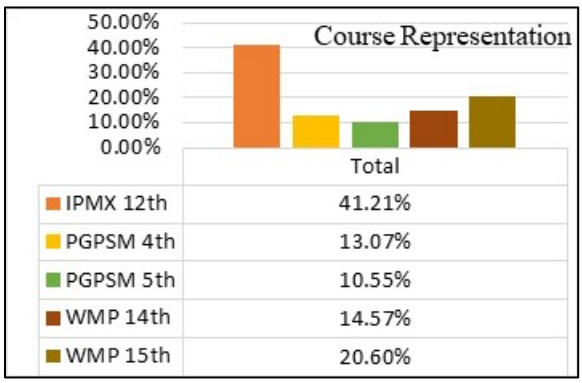
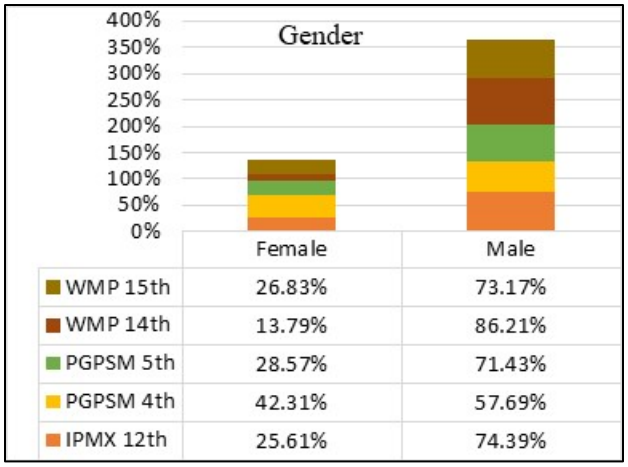


Figure 5
Course representation.

The percentage of women candidates opting for management courses has increased over the years in India. In this study, the total percentage of men was 73.37% and women was 26.63% combined for all courses (see Figure 6).



	Female	Male
WMP 15th	26.83%	73.17%
WMP 14th	13.79%	86.21%
PGPSM 5th	28.57%	71.43%
PGPSM 4th	42.31%	57.69%
IPMX 12th	25.61%	74.39%

Figure 6
Gender.

Library Usage Pattern

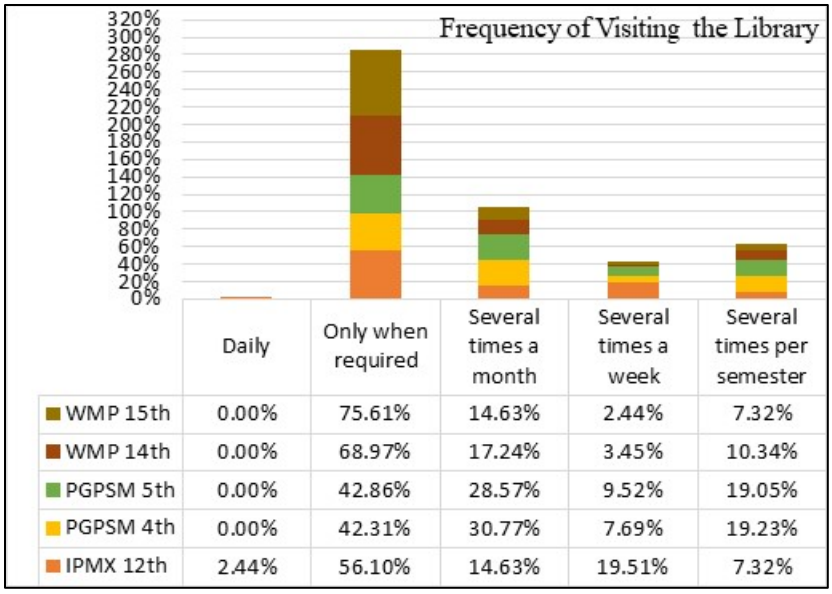
The data revealed that most of the students (58.79%) came to the library only when required; 18.59% came several times a month; 11.06% several times a week; 10.55% several times per semester; and only 1.01% came to the library daily.

However, all students used e-resources almost every day. The students did not sit and study inside the library, showing that the library space was not utilized correctly and was more like a traditional library. These data also revealed that the circulation of print books has not been reduced, and the acquisition, technical, and circulation processes have not been impacted. The entry register kept at the entrance showed that the user footfall has decreased over the years. Only 3-4 students entered the library daily, largely for the issue or return of books. During examination times, however, the number of users increased.

In response to the question regarding the time students spent in the library, the data showed that many students (34.67%) spent 1-3 hours, followed by 29.65% who spent less than 30 minutes, 23.62% spent 30 minutes to 1 hour, 11.06% spent 3-6 hours, and 1.01% spent more than 6 hours in the library.

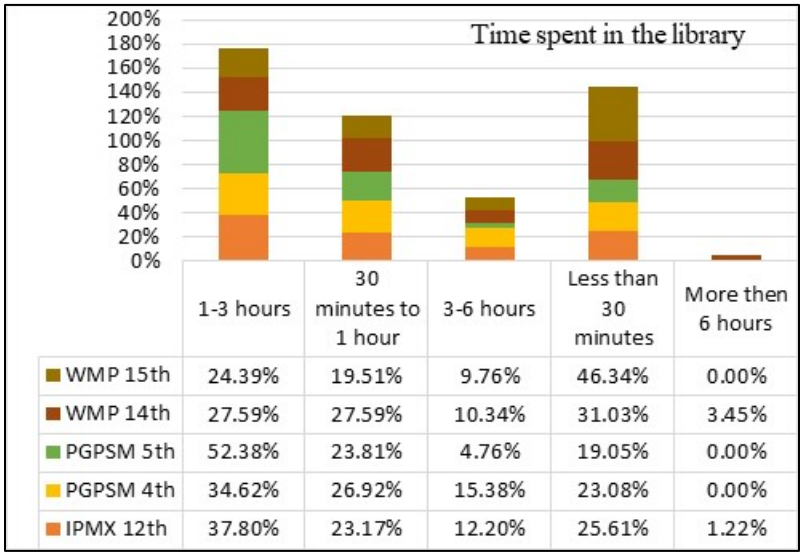
The inference revealed from these data was that most students (64.32%) spent 1 to 3 hours or less than 30 minutes inside the library whenever they used it.

Most of the students (67%) preferred using the library from 6:00 P.M. to 12:00 A.M. The main reason was that the students have classes from 9:00 A.M. to 5:30 P.M. The best time was the evening time to study for them. The course-specific details showed that 78% of IPMX students, 66% of WMP 2nd year students, 63% of WMP 1st year students, 54% of PGPSM 1st year students, and 48% of PGPSM 2nd year students fell into this category. The next most popular time slot—from 12:00 P.M. to 6:00 P.M.—was used by 20% of students. These data indicated that the students' most preferred time to visit the library (87%) is a 12 hour window between 12:00 P.M. to 12:00 A.M.



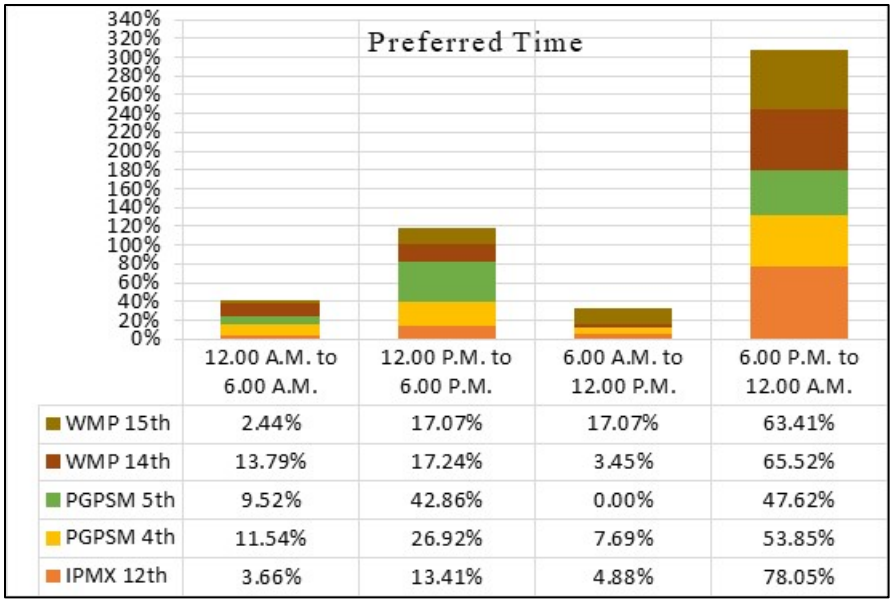
	Daily	Only when required	Several times a month	Several times a week	Several times per semester
WMP 15th	0.00%	75.61%	14.63%	2.44%	7.32%
WMP 14th	0.00%	68.97%	17.24%	3.45%	10.34%
PGPSM 5th	0.00%	42.86%	28.57%	9.52%	19.05%
PGPSM 4th	0.00%	42.31%	30.77%	7.69%	19.23%
IPMX 12th	2.44%	56.10%	14.63%	19.51%	7.32%

Figure 7
Frequency of visiting the library.



	1-3 hours	30 minutes to 1 hour	3-6 hours	Less than 30 minutes	More then 6 hours
WMP 15th	24.39%	19.51%	9.76%	46.34%	0.00%
WMP 14th	27.59%	27.59%	10.34%	31.03%	3.45%
PGPSM 5th	52.38%	23.81%	4.76%	19.05%	0.00%
PGPSM 4th	34.62%	26.92%	15.38%	23.08%	0.00%
IPMX 12th	37.80%	23.17%	12.20%	25.61%	1.22%

Figure 8
Time spent in the library.



	12.00 A.M. to 6.00 A.M.	12.00 P.M. to 6.00 P.M.	6.00 A.M. to 12.00 P.M.	6.00 P.M. to 12.00 A.M.
WMP 15th	2.44%	17.07%	17.07%	63.41%
WMP 14th	13.79%	17.24%	3.45%	65.52%
PGPSM 5th	9.52%	42.86%	0.00%	47.62%
PGPSM 4th	11.54%	26.92%	7.69%	53.85%
IPMX 12th	3.66%	13.41%	4.88%	78.05%

Figure 9
Preferred time.

The main reasons students used the library were identified by analyzing the case studies previously conducted on this topic, and the answers for the survey question: "Why do you go to the library?" The students could choose as many appropriate options as applicable.

The data showed that most students go to the library to take print-outs (i.e., print documents), followed by

- search information for assignments,
- read for the test or exam,
- study alone,
- issue or return books,
- use a computer for studies,
- read print journals or magazines,
- study in a group, and
- socialize with other students.

A few other reasons are to read newspapers and for peace of mind.

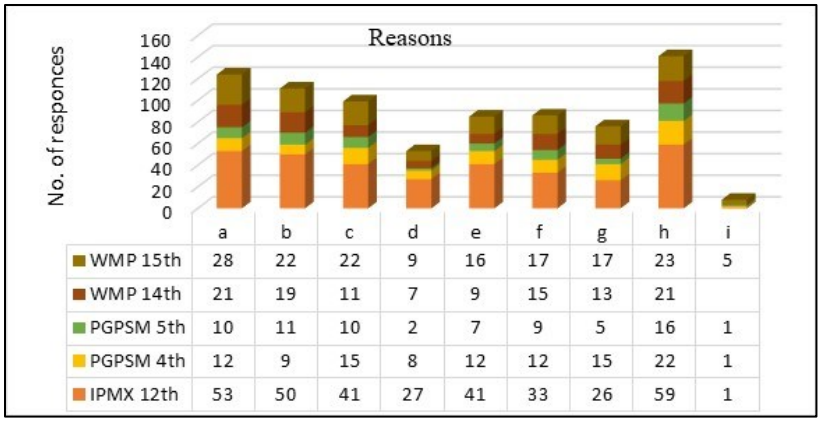


Figure 10
Reasons for visiting the library.

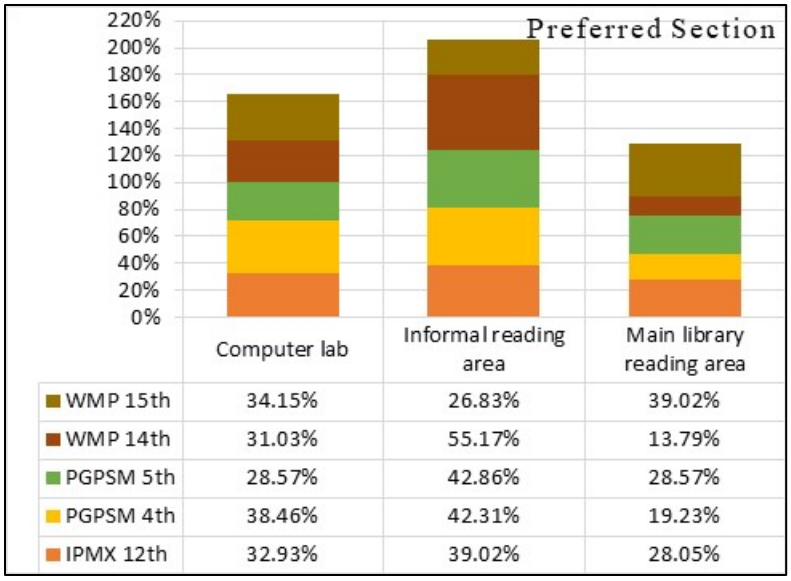
Legends (Reasons):

a. Search information for my assignment
b. Read for test or exam
c. Study alone
d. Study with a group
e. Use a computer for studies
f. Issue/return books
g. Read print journals/magazines
h. Take print-outs (i.e., print documents)
i. Socialize

Table 1
Reasons for Visiting the Library

Sr. No.	**Reason**	**Percentage**	**Sr. No.**	**Reason**	**Percentage**
1.	Take print-outs	70.85%	6.	Use a computer for studies	42.71%
2.	Search information for my assignment	62.31%	7.	Read print journals /magazines	38.19%
3.	Read for test or exam	55.79%	8.	Study with a group	26.63%
4.	Study alone	49.75%	9.	Socialize	4.02%
5.	Issue/return books	43.22%			

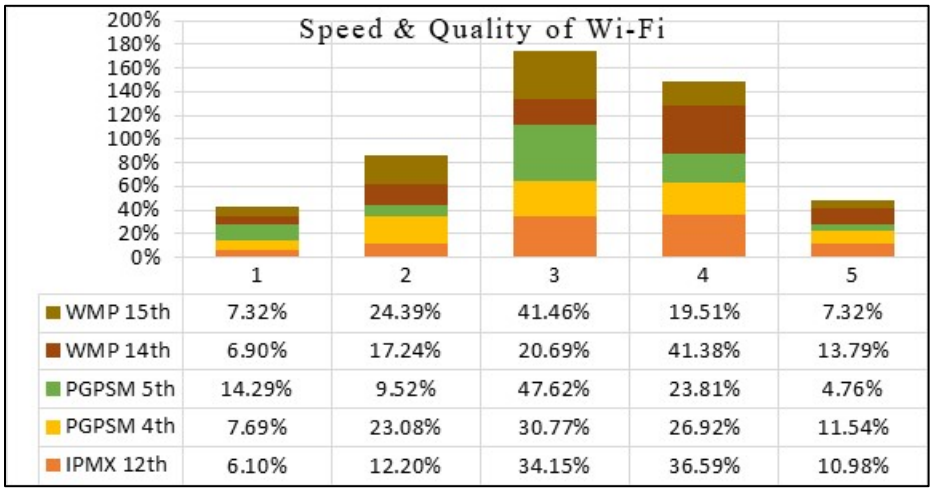
In the survey, the students identified their preferred section of the library, choosing between the library's three sections based on the functionality: the main library reading area, the informal reading area, and the computer lab. The data showed that the informal reading area was preferred by the most students (39.70%), followed by the computer lab (33.17%), and the main library reading area (27.14%). The informal reading area and the computer lab are open 24/7. That was why most of the students preferred to use those two areas. The second reason was that they can use this area for group study or discussions. Alternatively, this area can be used for silent study with their laptop and reading materials. However, problems may arise when different students want to use the informal reading area for both types of activities simultaneously.



	Computer lab	Informal reading area	Main library reading area
WMP 15th	34.15%	26.83%	39.02%
WMP 14th	31.03%	55.17%	13.79%
PGPSM 5th	28.57%	42.86%	28.57%
PGPSM 4th	38.46%	42.31%	19.23%
IPMX 12th	32.93%	39.02%	28.05%

Figure 11
Preferred section.

The students were asked to rate the speed and quality of Wi-Fi connectivity in the library using Likert's five-point scale. The most students (34.67%) rated it "Good", followed by "Very Good" (31.16%), "Fair" (16.58%), "Excellent" (10.05%), and "Poor" (7.54%). These results indicates that there is still room for improvement in Wi-Fi connectivity. The users would prefer to study in the library if the Internet speed and quality were much better than other areas on the campus.



	1	2	3	4	5
WMP 15th	7.32%	24.39%	41.46%	19.51%	7.32%
WMP 14th	6.90%	17.24%	20.69%	41.38%	13.79%
PGPSM 5th	14.29%	9.52%	47.62%	23.81%	4.76%
PGPSM 4th	7.69%	23.08%	30.77%	26.92%	11.54%
IPMX 12th	6.10%	12.20%	34.15%	36.59%	10.98%

Figure 12
Speed and quality of Wi-Fi.

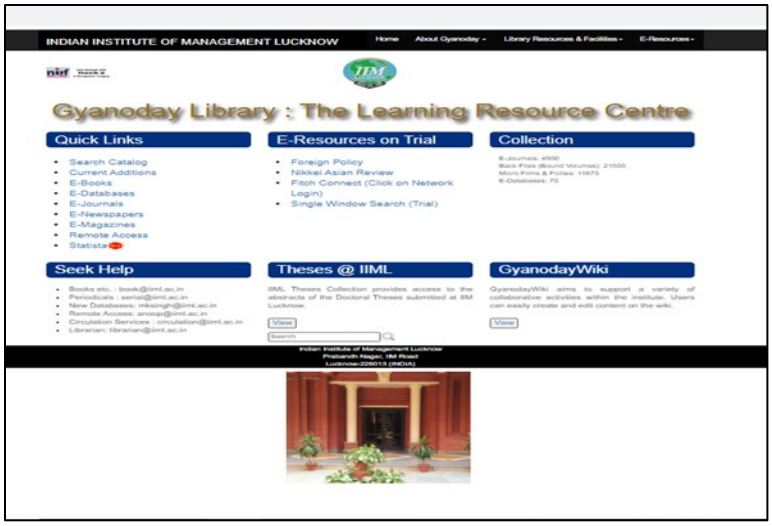
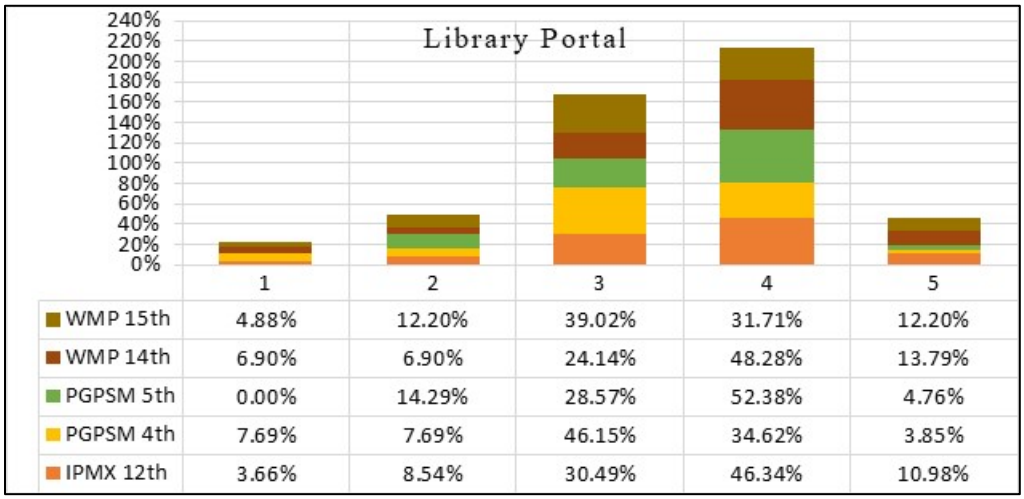


Figure 13
Web portal, IIM Lucknow library.

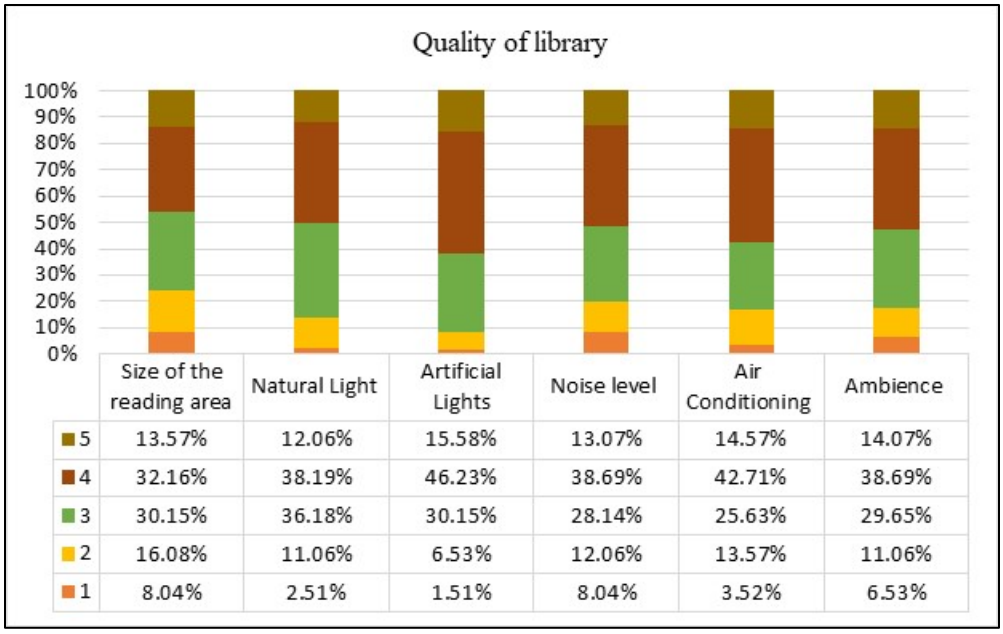
The library portal (see Figure 13), called "Gyanoday" (meaning *enlightenment*) is accessible through the intranet at both campuses and via remote access through Open Athens. All the e-resources are available there. The data collected about the usability and accessibility of the library portal show that the most students (42.71%) have rated it "Very good," followed by "Good" (33.17%), "Excellent" (10.05%), "Fair" (9.55%), and "Poor" (4.52%). The data indicate that the portal should be more user friendly and provide more information related to library resources and services.



	1	2	3	4	5
WMP 15th	4.88%	12.20%	39.02%	31.71%	12.20%
WMP 14th	6.90%	6.90%	24.14%	48.28%	13.79%
PGPSM 5th	0.00%	14.29%	28.57%	52.38%	4.76%
PGPSM 4th	7.69%	7.69%	46.15%	34.62%	3.85%
IPMX 12th	3.66%	8.54%	30.49%	46.34%	10.98%

Figure 14
Usability and accessibility of library portal.

Students were asked to rate the quality of the library based on various physical attributes on a scale from one to five: the library's size, natural light, light, air conditioning, noise level, and ambience. The data showed that the students were overall satisfied with the artificial lights, natural light, air conditioning, and somewhat with the library's ambience. However, they were not happy with the library's size or the noise level in the library. The author has tried to overcome these two shortcomings in the proposed model plan by creating research carrels for silent study and soundproof rooms for group study.

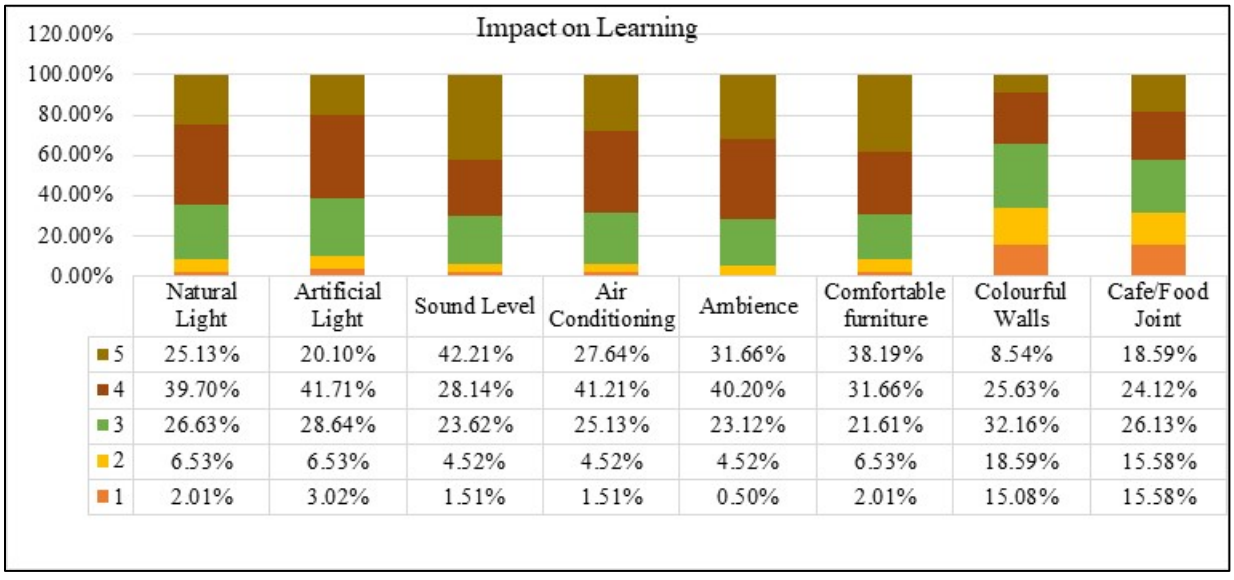


	Size of the reading area	Natural Light	Artificial Lights	Noise level	Air Conditioning	Ambience
5	13.57%	12.06%	15.58%	13.07%	14.57%	14.07%
4	32.16%	38.19%	46.23%	38.69%	42.71%	38.69%
3	30.15%	36.18%	30.15%	28.14%	25.63%	29.65%
2	16.08%	11.06%	6.53%	12.06%	13.57%	11.06%
1	8.04%	2.51%	1.51%	8.04%	3.52%	6.53%

Figure 15
Quality of library.

Students' Preference in Library Space and Furniture

The students were asked to rate the library's attributes, which, if included in the library, may influence their learning experience. The data showed that the most crucial feature, which was "extremely influential" in students' learning experience, was the level of sound in the library (42.21%), followed by comfortable furniture (38.19%). The next feature, which was "very influential," was artificial lights (41.71%), followed by air conditioning (41.21%), ambience (40.20%), and natural light (39.70%). The least influential features were colourful walls (15.08%) and café/food joints (15.58%).



	Natural Light	Artificial Light	Sound Level	Air Conditioning	Ambience	Comfortable furniture	Colourful Walls	Cafe/Food Joint
5	25.13%	20.10%	42.21%	27.64%	31.66%	38.19%	8.54%	18.59%
4	39.70%	41.71%	28.14%	41.21%	40.20%	31.66%	25.63%	24.12%
3	26.63%	28.64%	23.62%	25.13%	23.12%	21.61%	32.16%	26.13%
2	6.53%	6.53%	4.52%	4.52%	4.52%	6.53%	18.59%	15.58%
1	2.01%	3.02%	1.51%	1.51%	0.50%	2.01%	15.08%	15.58%

Figure 16
Impact on learning.

Students liked the idea of keeping the print materials in the library, but moving them to compact shelving; 39.20% of students found it "Likely" that by doing this, the space of the library would be better utilized. Other students were "Neutral" (28.64%), found it "Extremely likely" (20.60%), "Unlikely" (7.54%), or "Extremely unlikely" (4.02%). The proposed model has the provision of compact shelving in the left wing.

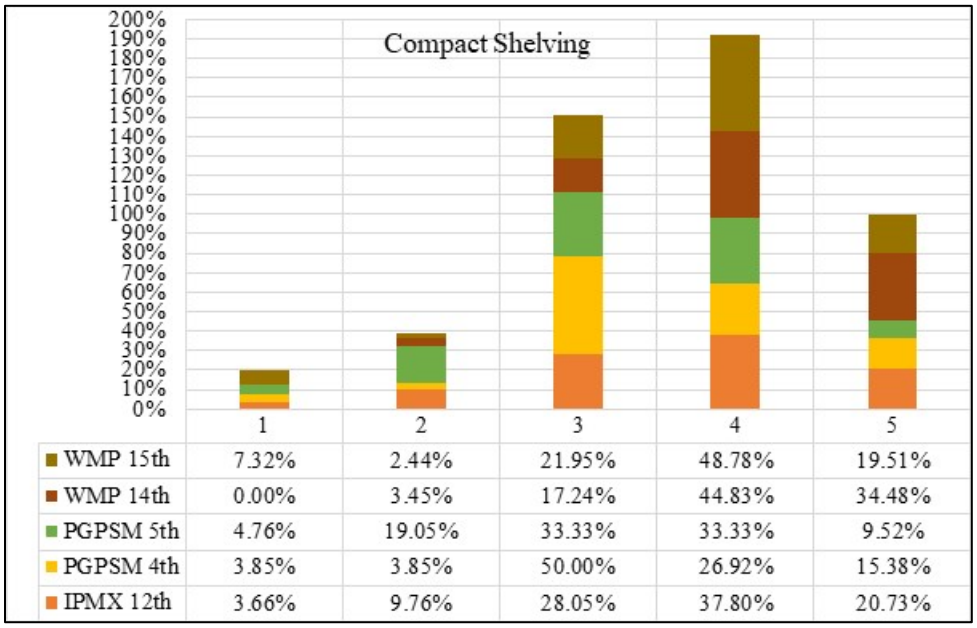
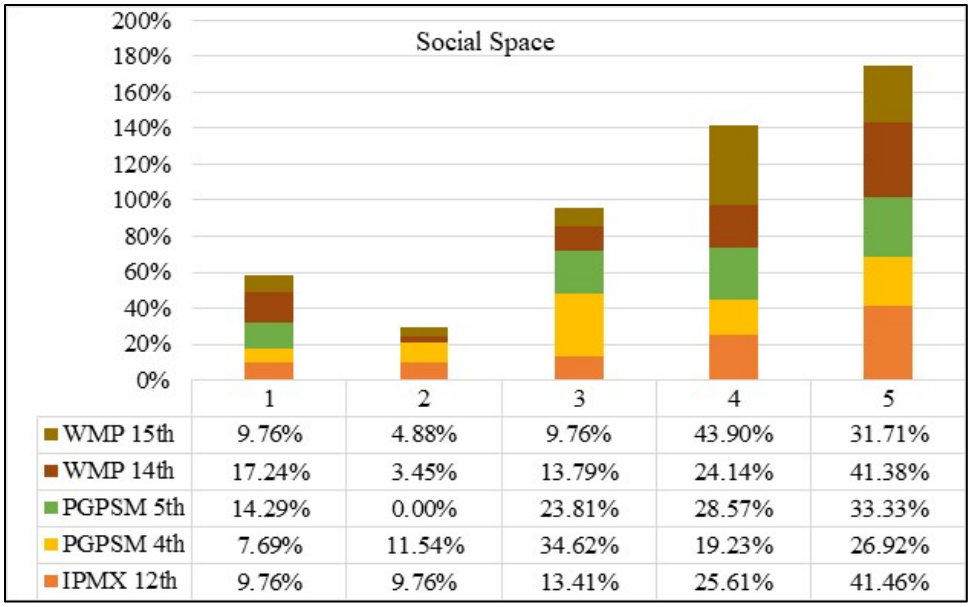


Figure 17
Compact shelving.

While collecting data to find out students' desire to include social spaces in the library, we found that the most students (36.68%) considered it "Very desirable" to have social spaces, followed by 28.64% considering it "Desirable," 16.58% listing their feelings as "Neutral," 11.06% considering it "Very undesirable," and 7.04% considering it "Undesirable." It is interesting to note that 41.46% of IPMX students and 41.38% of WMP 2nd year students rated social space in the library as “Very desirable.” These students were senior and middle-level executives, respectively. They were interested in knowing and discussing various social topics in a comfortable and stimulating environment with their peer group.

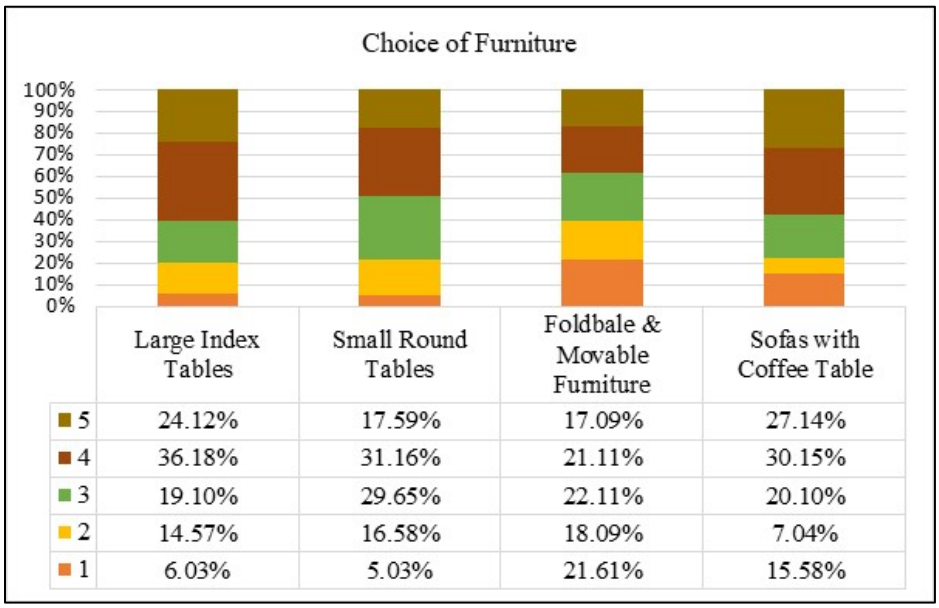


	1	2	3	4	5
WMP 15th	9.76%	4.88%	9.76%	43.90%	31.71%
WMP 14th	17.24%	3.45%	13.79%	24.14%	41.38%
PGPSM 5th	14.29%	0.00%	23.81%	28.57%	33.33%
PGPSM 4th	7.69%	11.54%	34.62%	19.23%	26.92%
IPMX 12th	9.76%	9.76%	13.41%	25.61%	41.46%

Figure 18
Social space.

When we asked students their reasons for visiting the library, only 1% of students responded to socialize, but while asking about the desirability for social space in the library, almost 37% rated it as very desirable, and 29% rated it as desirable. It showed that if the library provided social space on its premises, 66% of students would prefer to use it.

The next set of data were about the type of furniture preferred by the students. Most of the students rated all the features included in the survey as "desirable," particularly large index tables with 4-6 chairs, sofas with coffee tables, small round tables with 2-3 chairs, and foldable and movable tables and chairs.

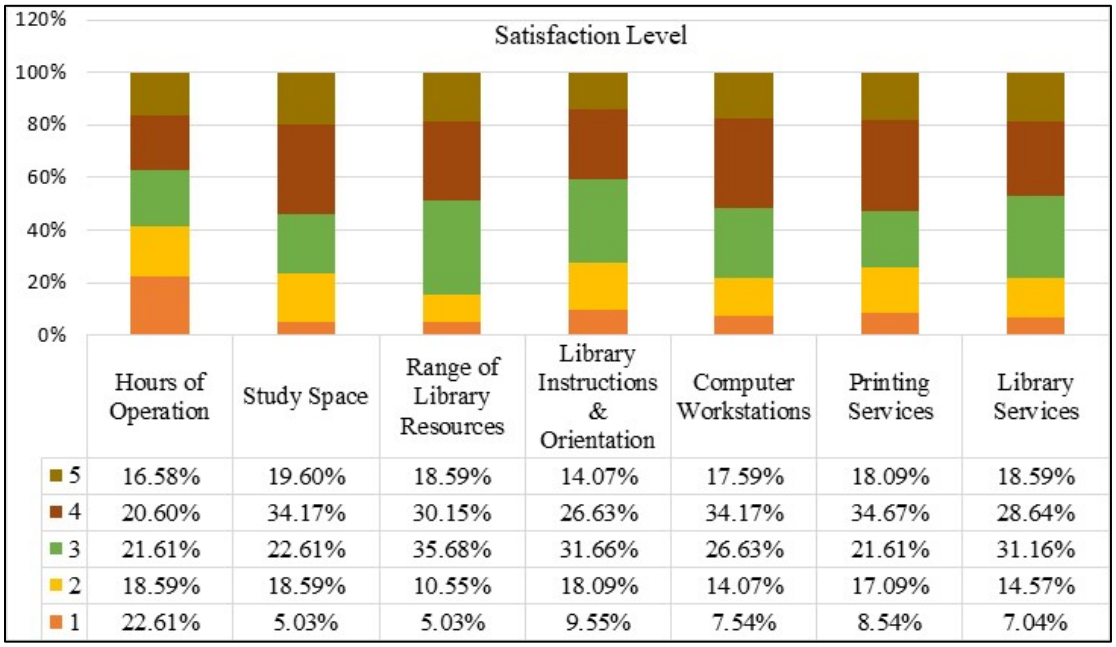


	Large Index Tables	Small Round Tables	Foldbale & Movable Furniture	Sofas with Coffee Table
5	24.12%	17.59%	17.09%	27.14%
4	36.18%	31.16%	21.11%	30.15%
3	19.10%	29.65%	22.11%	20.10%
2	14.57%	16.58%	18.09%	7.04%
1	6.03%	5.03%	21.61%	15.58%

Figure 19
Choice of furniture.

Satisfaction With the Library

The students were asked to rate their satisfaction with various library services and operations on a five-point scale. Most students were "satisfied" with study spaces, computers, printing facilities, library services, and library orientation. However, they were "least satisfied" with the library's hours of operation. If there were a sufficient number of staff members, the library could be opened for more time. However, the reading area and the computer centre is open 24/7.



	Hours of Operation	Study Space	Range of Library Resources	Library Instructions & Orientation	Computer Workstations	Printing Services	Library Services
5	16.58%	19.60%	18.59%	14.07%	17.59%	18.09%	18.59%
4	20.60%	34.17%	30.15%	26.63%	34.17%	34.67%	28.64%
3	21.61%	22.61%	35.68%	31.66%	26.63%	21.61%	31.16%
2	18.59%	18.59%	10.55%	18.09%	14.07%	17.09%	14.57%
1	22.61%	5.03%	5.03%	9.55%	7.54%	8.54%	7.04%

Figure 20
Satisfaction level.

Desirable Components

The three "most desirable" components students would want included in an ideal learning environment were: "Silent study area/research carrels" (50.25%), "Scanners" (44.22%), and "Color printers" (44.22%). Figure 16 and Table 2 describe the percentage distribution of each component on a scale of five. The "least desirable" component was a 3D printer with software (12.56%).

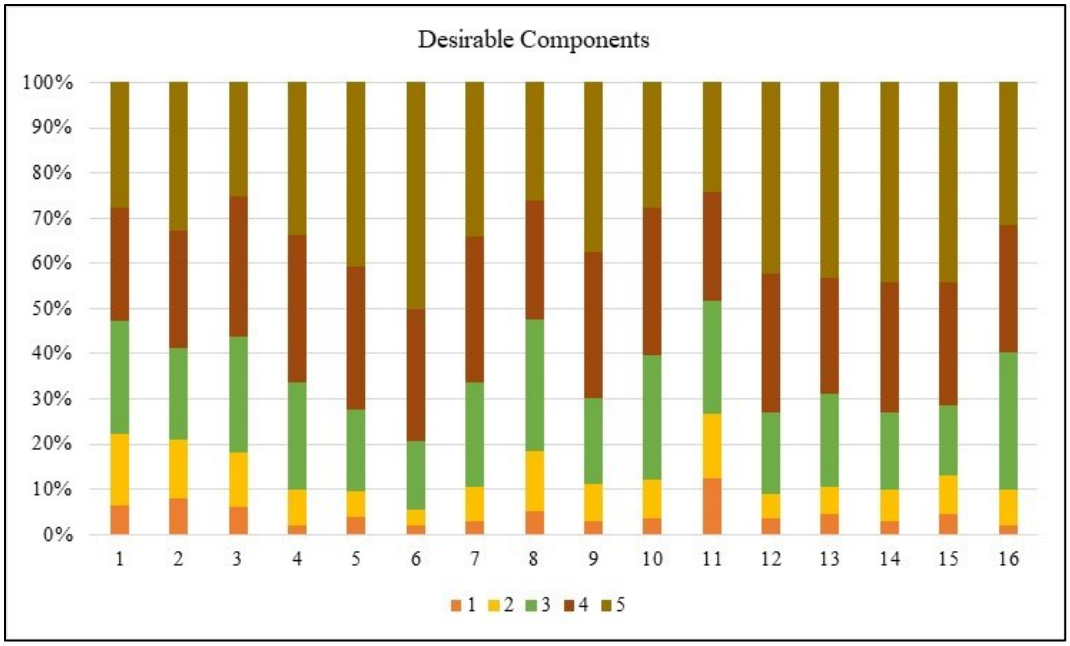


Figure 21
Desirable components.

Table 2
Desirable Components

	Components	**Very Desirable**	**Desirable**	**Neutral**	**Undesirable**	**Very Undesirable**
1	Café/ Refreshment joint	32.66%	26.13%	20.10%	13.07%	8.04%
2	Video Conferencing Room	27.64%	25.13%	25.13%	15.58%	6.53%
3	Flexible Spaces/Movable Furniture	25.13%	31.16%	25.63%	12.06%	6.03%
4	Silent Study Area/Study Carrels	50.25%	29.15%	15.08%	3.52%	2.01%
5	Group Study Zone	40.70%	31.66%	18.09%	5.53%	4.02%
6	E-Learning Classrooms	33.67%	32.66%	23.62%	8.04%	2.01%
7	Smartboards	34.17%	32.16%	23.12%	7.54%	3.02%
8	Big Screens	26.13%	26.13%	29.15%	13.57%	5.03%
9	Small Seminar Room	37.69%	32.16%	19.10%	8.04%	3.02%
10	Video Making/Media Production	27.64%	32.66%	27.64%	8.54%	3.52%
11	3D Printer with Software	24.12%	24.12%	25.15%	14.07%	12.56%
12	Library Website	42.21%	30.65%	18.09%	5.53%	3.52%

13	Mobile App for the library	43.22%	25.63%	20.60%	6.03%	4.52%
14	Scanners	44.22%	28.64%	17.09%	7.04%	3.02%
15	Color Printers	44.22%	27.14%	15.58%	8.54%	4.52%
16	Makerspace	31.66%	28.14%	30.15%	8.04%	2.01%

Suggestions for Improving Library Facilities

Students were asked to provide suggestions for making the library an ideal learning environment. For this purpose, an open-ended question was included in the survey. A few key points, selected from the responses, are listed below:

- 24/7 functional library, full of print, digital and online resources, with the most suitable internet speed and comfortable furniture.
- The perfect ambience would be with natural light and other furniture/décor.
- A quiet study space, along with separate group discussion/presentation practice spaces, is required.
- Self-checkout/check-in kiosk.
- A cozy place with air-conditioned rooms and lots of reading materials and journals.
- An informal cubicle type place for group study with sofa and table is a must.
- Common area with bean bags and positive experience.
- Cafe serving tea and coffee.
- An audio-visual room would be welcome to watch videos.
- A perfect library must be a quiet space where all reading material is at hand. Audio and video books are to be streamed on Wi-Fi so that students can use their headphones to analyze the topic better.

Research Findings

The research findings showed that students were not frequent visitors to the library. They used it only when required. The average usage was for 1-3 hours. Most of them used it between 6:00 P.M. to 12:00 A.M. The two primary reasons for visiting the library were taking printouts and searching for information for assignments.

The students were satisfied with the Wi-Fi speed and quality and the library portal's usability and accessibility. Most of them rated the library as "Very Good" based on various physical attributes like ambience, air conditioning, noise level, lights, natural light, and library size. Most of the students were not satisfied with the hours of operation of the library. However, they were satisfied with the study space, library instruction/orientation session about library resources, library services, and computer workstations in the lab and printing facilities. They were unsure about the library's range of learning resources (books/journals/media).

Natural light, artificial lights, sound, air conditioning, ambience, comfortable furniture, colourful walls, and cafe/food joint are all factors that would enhance the students' learning experience. Most students favoured keeping the print books and bound journals in compact shelving as the library space would be better utilized.

The students preferred large index tables with 4-6 chairs over small round tables with 2-3 chairs, sofas with coffee tables, and foldable and movable tables and chairs. Most of the students wanted to have social spaces in the library. Being a small campus, they needed a centrally located place, open 24/7, that was adequately lit, full of ambience, and comfortable furniture.

The choices of the students for the features to be included in the IC (in order of preference) were as follows:

Table 3
Preferred Features

S. No.	IC Features	Incorporated in Plan	Remarks
1	Silent Study Area/Study Carrels	Yes	
2	Scanners	Yes	
3	Colour printers	Yes	
4	Mobile App for the Library	No	The author published research on the topic in 2016. Yet to be implemented
5	Library Website	Yes	Though it needs improvement
6	Group Study Zone	Yes	
7	Small Seminar Room	Yes	
8	Smart Boards	Yes	
9	E-Learning Classrooms	Yes	
10	Café/ Refreshment joint	Yes	
11	Makerspace	No	Not chosen by the students
12	Video Making/Media Production	No	No space is left for this facility
13	Video Conferencing Room	Yes	
14	Big Screens	Yes	
15	Flexible Spaces /Movable Furniture	Yes	
16	3D Printer with Software	No	Not chosen by the students

The Existing Plan of the Library

Right Wing

The library is situated on the second floor of the Administration block. It has two wings. The library operates from the right-wing. The existing library has a stack area, print journals display, reading area, and bound volumes in one portion. This portion is open from 9:00 A.M. to 6:30 P.M. The other has a computer lab and an informal reading area. This portion is open 24/7. A glass partition divides the library into two parts (Refer to Figure 17 in Appendix B).

Left Wing

The left-wing is currently not used for the library. Though the whole second floor was constructed for the library, the institute's left-wing is being used for student examination purposes. While creating a model for IC, the author has used both wings. With minimal changes in the existing infrastructure, maximal components have been incorporated to convert the library into an ideal learning place for students

(refer to Figure 19 in Appendix B).

Connecting Lobby

The lobby area that connects the left wing to the right wing is currently not being used. There is a room, which the institution's visiting doctor is using. Two makeshift rooms have been constructed recently for the Computer Centre (CC) manager and CC staff at the lobby entrance (Refer to Figure 21 in Appendix B).

Model Plan of IC

Based on the data analysis, a model plan for the existing library has been designed, which is the study's primary aim. The research findings have been incorporated into the model plan of the library. The plan has been designed so that with minimum expenses, maximum improvement can be achieved.

The students used the library mainly to take printouts as printers were available only in the library's computer lab. Likewise, books were available only in the library, so students had to visit the library for issuing and returning books. If its services and spaces were enhanced according to the students' requirements, they could utilize the library's full potential. At the same time, using the library space and resources for a better learning experience would improve learning outcomes.

Right Wing

Based on the data analyzed, the right wing has been remodelled accordingly. The bound volumes and book stacks have been shifted to the left wing, and the area thus vacated is now used for video conferencing, a small seminar room (as desired by 36.7% of students), and research carrels (as desired by 46.6% of students).

Four group study rooms (as desired by 37.9% of students) and the CC manager's office have been placed in this wing. These rooms will be made soundproof.

The reading tables have been shifted to the left wing. Sofa sets, chairs, and bean bags have been moved to the left wing. Workstations in the computer lab have been rearranged. This arrangement will allow the lab to be used as an e-classroom also, as desired by 35% of students. A smart TV with a large monitor has also been added to the lab for the same purpose (Refer to Figure 18 in Appendix B).

Left Wing

The left wing has been planned as a quiet zone. The books have been kept in compact shelving (as desired by 38.6% of students) to utilize the space for seating purposes. The bound volumes of journals are also kept on compact shelves. The acquisition room has been shifted to the left wing. A storeroom is also in this wing. Current periodicals, magazines, and newspapers have been moved from the right to left wing. Research carrels (as desired by 46.6% of students) for quiet reading have been planned for this wing also. Sofa sets, comfortable chairs, and bean bags have been put in proper places (Refer to Figure 20 in Appendix B).

Connecting Lobby

The lobby area was initially earmarked for the circulation service of the library. The model plan has the same purpose for space. A circulation desk has been proposed to be built on the opposite side of the entrance. The option for self-check-in and check-out of library documents is also there. The room, which the visiting doctor currently uses, has been proposed to be the librarian's room. The CC manager and staff have been shifted to the right wing. Their offices have been repurposed into a photocopy/scanner/printer room and locker-room, respectively. Tea and coffee vending machines (as desired by 33.9% of students) and snack machines have been placed in the lobby area. Some bean bags and chairs have been put in this area (Refer to Figure 22 in Appendix B).

Conclusion

A few top Indian higher education institutes are currently taking library infrastructure transformations seriously. These institutes have recently renovated their libraries with the help of Corporate Social Responsibility (CSR) funds from various companies. Still, it was a long journey before dedicated ICs for Indian colleges and universities were the main focus.

The main obstacle in front of librarians is to convince stakeholders that they play an important role in achieving the institute's learning, teaching, and research goals. To overcome this obstacle, they must have research-based data. The available data is based on international research. As said earlier, there is much difference between Indian and Western countries' socio-cultural values, economic conditions, and educational systems.

The present study is the first step in research on IC in the Indian context. This pilot study has captured the perception and expectations of all levels of students – postgraduate, working executives, and senior-level executives. Most of the suggestions gathered through the survey have been incorporated into the library's space plan. With very few construction changes and new furniture, this model can be easily implemented in a small academic library without discarding the old furniture.

Author Contributions

Kavita Chaddha: Conceptualization, Methodology, Analysis, Interpretation, Visualization, Software, Writing **Uma Kanjilal:** Guidance, Review, Supervision

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Appendix A
Survey Questionnaire

1. Name of the course

2. Gender

3. How often do you visit the library?
   a. Only when required
   b. Several times per semester
   c. Several times a month
   d. Several times a week
   e. Daily

4. How much time do you spend in the library?
   a. More than 6 hours
   b. 3-6 hours
   c. 1-3 hours
   d. 30 minutes to 1 hour
   e. Less than 30 minutes

5. What time do you prefer to use the library?
   a. 6.00 A.M. to 12.00 P.M.
   b. 12.00 P.M. to 6.00 P.M.
   c. 6.00 P.M. to 12.00 A.M.
   d. 12.00 A.M. to 6.00 A.M.

6. Why do you visit the library? You may opt for as many as applicable.
   a. Search information for my assignment
   b. Read for test or exam
   c. Study alone
   d. Study with a group
   e. Use a computer for studies
   f. Issue/return books
   g. Read print journals/magazines
   h. Take print-outs
   i. Socialize

7. Which section of the library do you use most and why?
   a. Main library reading area
   b. Informal reading area
   c. Computer lab

8. Please rate the speed and quality of Wi-Fi connectivity inside the library on a scale of 5, where 1 stands for the "least" and 5 stands for the "most."

9. Please rate the usability and accessibility of the library portal on a scale of 5, where 1 stands for the "least" and 5 stands for the "most."

10. Please rate the quality of reading space in the library based on given features on a scale of 5, where 1 stands for "least" and 5 stands for "most."
    a. Size of the library area
    b. Natural light
    c. Lights
    d. Noise level
    e. Air Conditioning
    f. Ambience

11. Please rate the impact of the library's following features on students' learning experience on a scale of 5, where 1 stands for "least" and 5 stands for "most."
    a. Natural light
    b. Artificial lights
    c. Sound
    d. Air Conditioning
    e. Ambience
    f. Comfortable furniture
    g. Colourful walls
    h. Café/food joint

12. Do you think the library space would be better utilized if the print books/journals were kept in compact shelving? Please give your response on a scale of 5, where 1 stands for "least likely," and 5 stands for "most likely."

13. What kind of furniture do you prefer in the library? Please give your response on a scale of 5, where 1 stands for "least desirable" and 5 stands for "most desirable."
    a. Large index tables with 4-6 chairs
    b. Small round tables with 2-3 chairs
    c. Foldable and movable tables and chairs
    d. Sofas with coffee tables

14. Do you think that the library should have social spaces/lounge/casual settings? Please give your response on a scale of 5, where 1 stands for "least required" and 5 stands for "most required."

15. Please rate how satisfied you are with the library services on a scale of 5, where 1 stands for "least satisfied" and 5 stands for "most satisfied."
    a. Hours of Operation
    b. Study space
    c. Range of learning resources in the library (books/journals/videos)
    d. Library instruction/orientation session about library resources
    e. Computer workstations in the lab
    f. Printing facility
    g. Library services, i.e., circulation, reference

16. Please assign numbers (1-5) to each component; our library should have, where 1 stands for "least desirable" and 5 stands for "most desirable."

S. No.	Feature
1.	Café/refreshment zone
2.	Video conferencing room
3.	Flexible spaces/movable furniture
4.	E-learning Classrooms
5.	Group study zones
6.	Silent study areas/study carrels
7.	Smartboards
8.	Big Screens
9.	Small seminar room/s for presentation practice
10.	Video making/ editing suites/ media production
11.	3D printer with software
12.	Library website
13.	Library Mobile App
14.	Scanners
15.	Colour Printers
16.	Makerspace

17. Please give your suggestions for improving the library to enhance your learning experience.

Appendix B

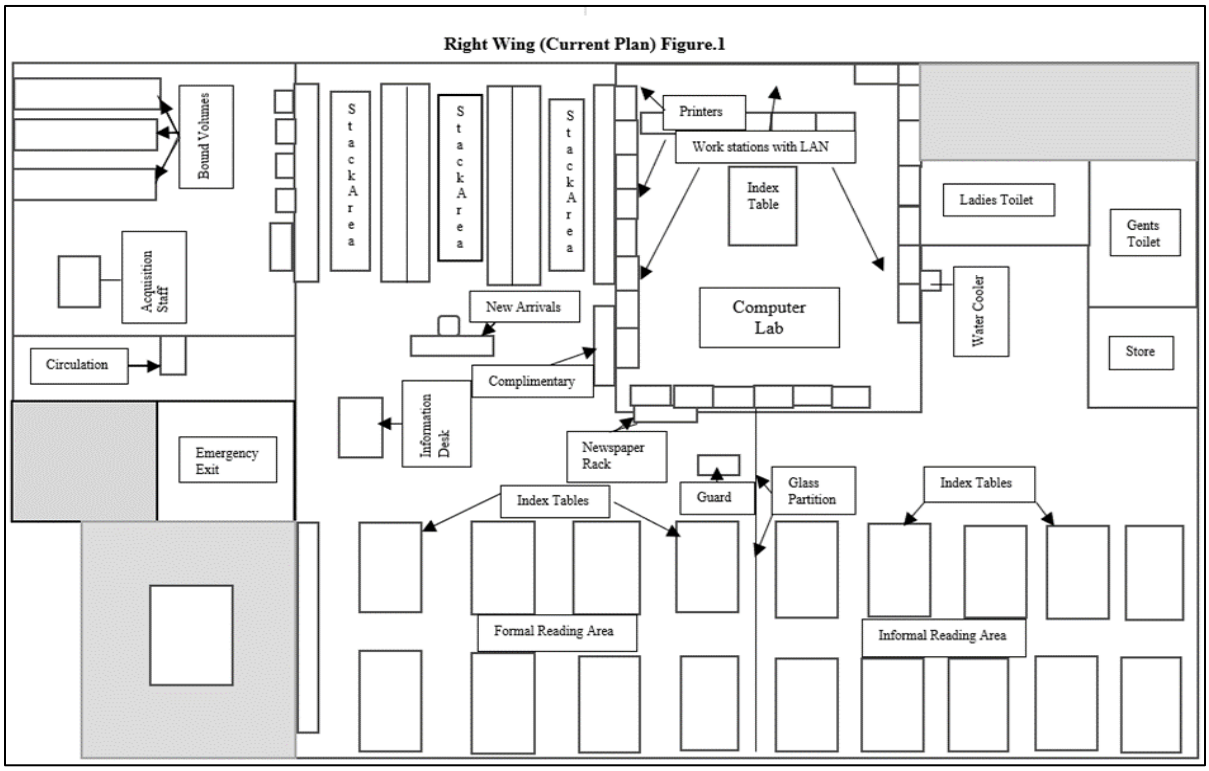

Figure 22
Existing plan (right wing).

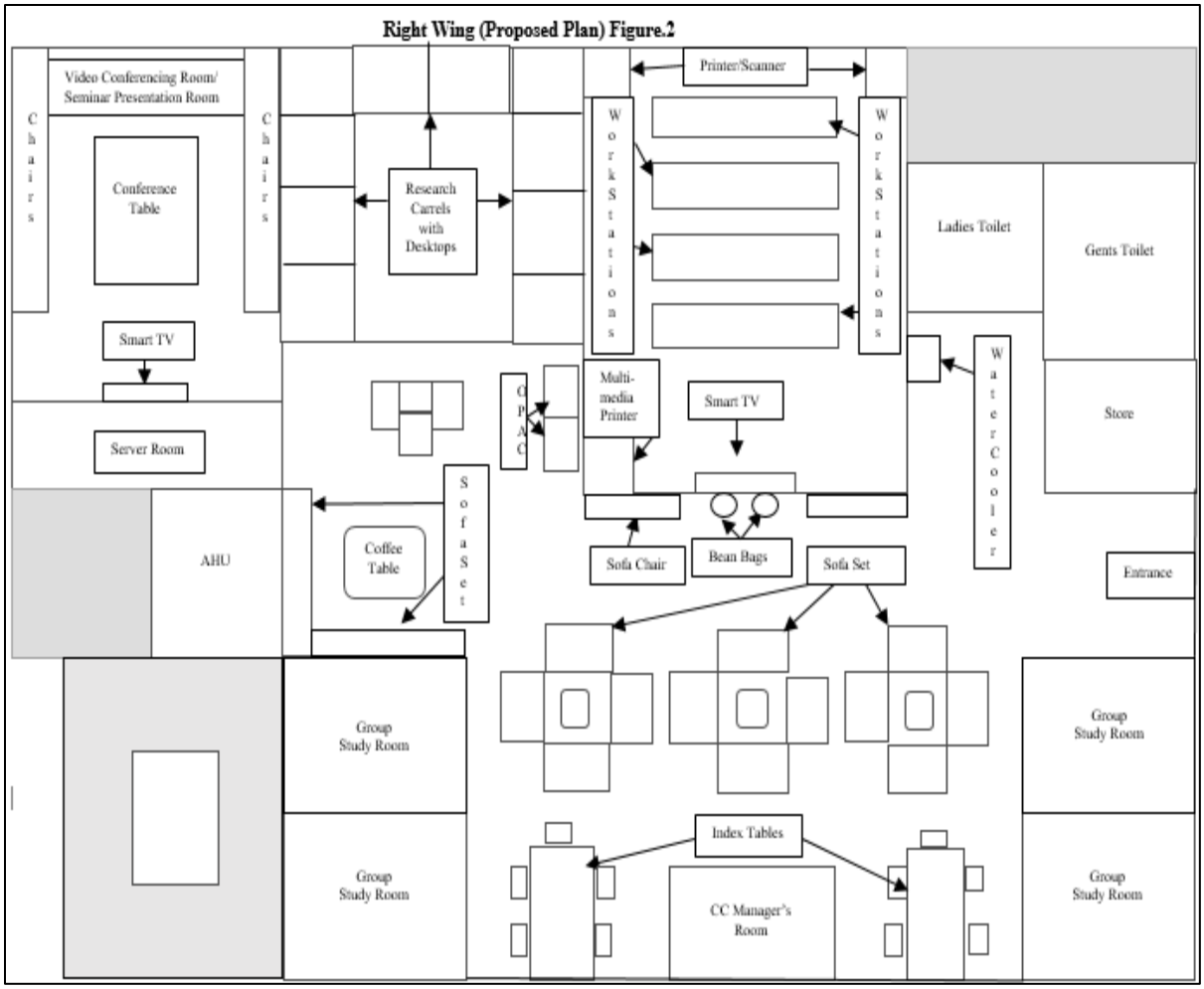

Figure 23
Proposed plan (right wing).

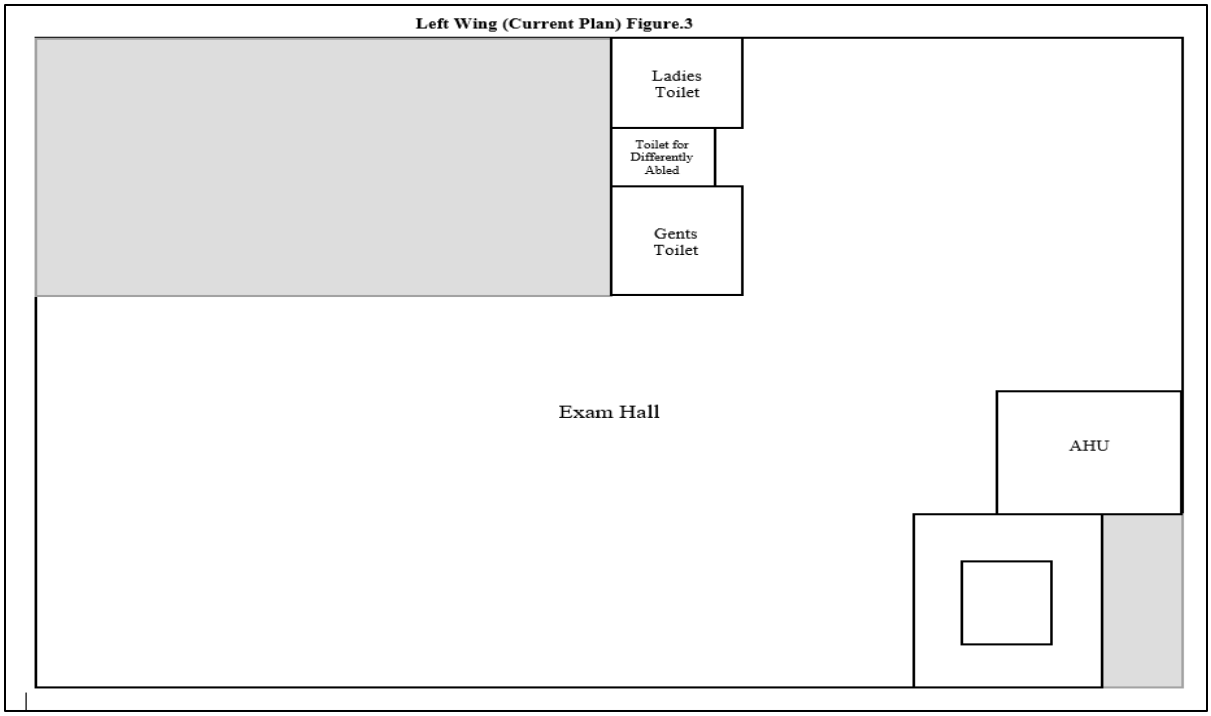

Figure 24
Existing plan (left wing).

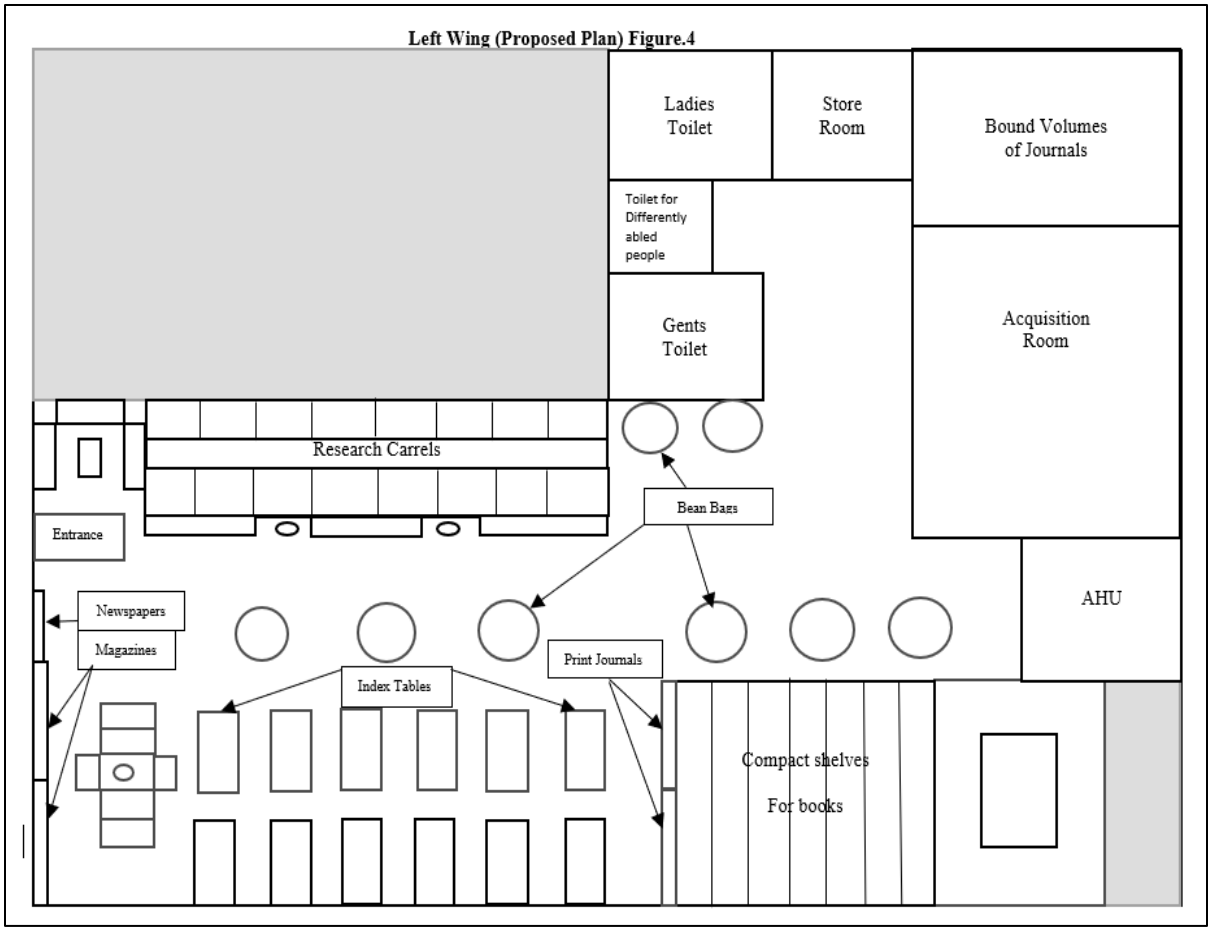

Figure 25
Proposed plan (left wing).

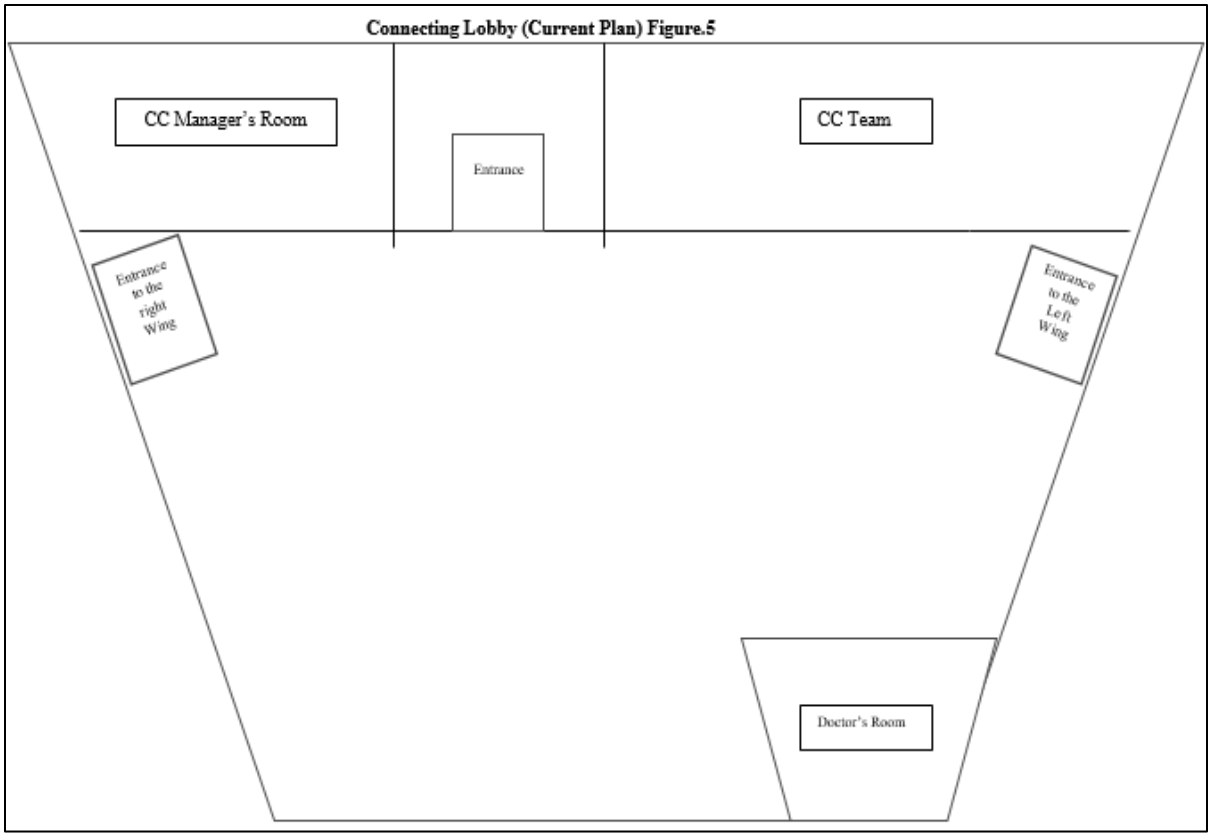

Figure 26
Existing plan (connecting lobby).

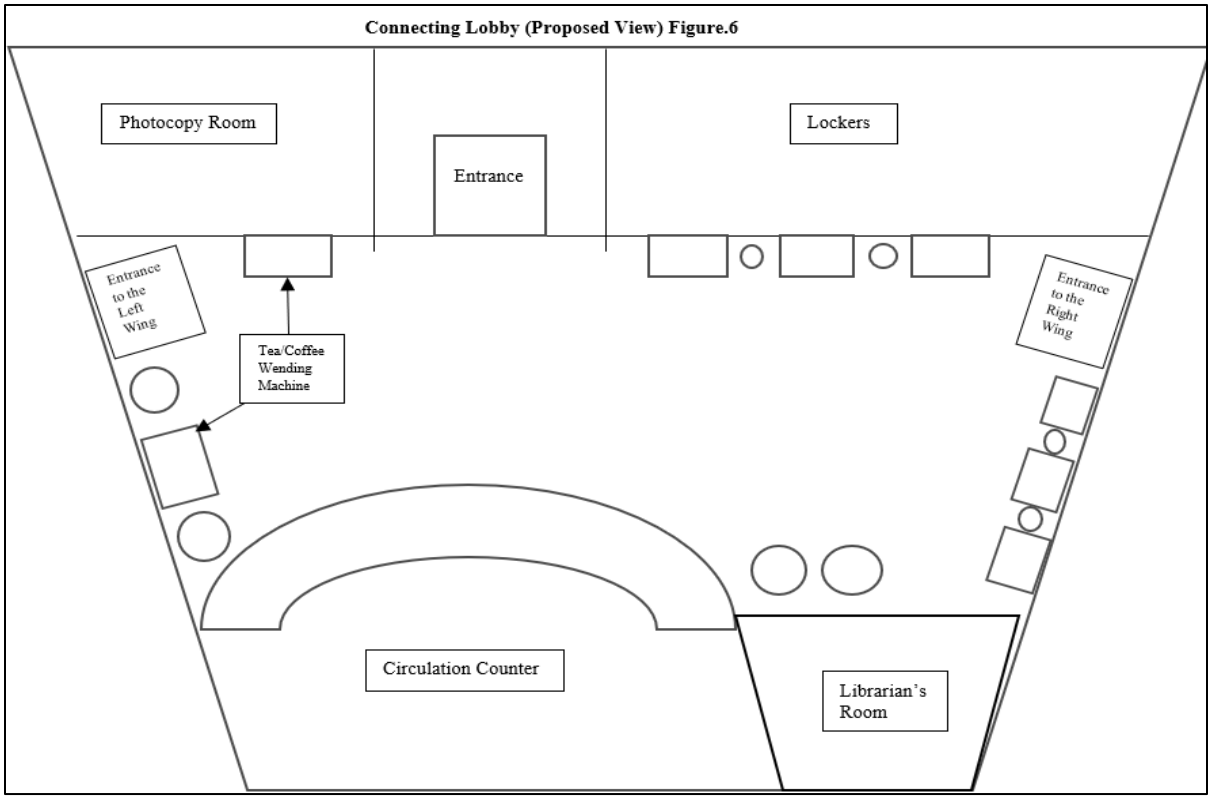

Figure 27
Proposed plan (connecting lobby).