STATISTICAL ANALYSIS OF READING HABITS IN PASSING OUT ENGINEERING STUDENTS: CASE STUDY OF NSUT DELHI

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Assistant Librarian (stage IV), Central Library, Netaji Subhas University of Technology, Sector-3, Dwarka, New Delhi - 110078. Email: prabhatkumar8779@gmail.com The book lending service of Central Library, Netaji Subhas University of Technology (NSUT) was computerized in the year 2016 using a digital platform namely, e-Granthalaya from National Informatics Centre (NIC). The computerized Library book lending service provided to the passing out undergraduate engineering students has been studied. The passing out students during the academic years 2016-2017 to 2020-2021 were admitted in the institute in the academic years 2013-2014 to 2017-2018, following which the Library service to them has been provided. Library has added 3845 undergraduate engineering students to Library-Member Database under different categories namely, BE2013, BE2014, BE2015, BE2016, and BE2017 for providing the service. Out of these numbers, 32.8% students were found interested in Library book lending services in their respective passing out years. It has been noticed from 7th& 8th semesters in passing-out years, the students were interested more in 7th semester for library service than in the 8th semester. With the announcement of nationwide lockdown on 5th March 2020 for 68 days due to the Covid19 pandemic, most academic activities in India came to standstill. With the easing of restrictions and allowing academic-activities, the library book lending services are also slowly returning to normalcy. The qualitative impact of the pandemic is much bigger than the quantitative impact on the library service. The objective of the paper is to study the nature of the computerized Library book lending service provided to passing out undergraduate engineering students of NSUT from the academic year 2016-2017 till the year 2020-2021.

Keywords: Delhi; Netaji Subhas University of Technology; Library Book Lending Service; Library Management Software; Reading habit; Undergraduate engineering student; Covid19; Pandemic.

INTRODUCTION

The study on reading habits has remained one of the important subjects as "Basic skill", in "Tertiary institutions", for "developing Library collection" and many more. Referring few studies,Florence et al. (2017) have mentioned that reading habits were connected with students' gender

and age. Even in the digital age, the libraryis playing the role for increasing the reading habit in users. Jabeen et al.(2018) have mentioned, "The library has a role in the digital world as with print, in encouraging access paths to quality. But such role (s) need to be realized by the authorities is quite essential". For the effective role either in digital world or in print world, the services of the Library shouldbe evaluated regularly. American Library Association has prepared the practical guidelines and tools for Libraries to evaluate their maintenance, administration, and service in the year 1924, Maraddi and Kolle (2017). During digital world in India, the Government has included e-Granthalaya on the cloud for automation and networking of Government Libraries, in its Digital Agenda.

Netaji Subhas University of Technology (NSUT) became a state University on 26th September 2018 under Government of National Capital Territory of Delhi. Before this date, during February 1997 to September 2018, it was being known as Netaji Subhas Institute of Technology (NSIT) and affiliated with the University of Delhi. National Institutional Ranking Framework (NIRF, 2021) Ministry of Education, Government of India has ranked NSUT the 88th in India Ranking 2021 among engineering institutions through NIRF. The undergraduate engineering students passing out from NSUT in the minimum stipulated time of four years in the academic years 2016-17, 2017-18, 2018-19, 2019-20 & 2020-21 were admittedin the University of Delhi. The book lending service of NSUT Central Library has been computerized in the year 2016 using the e-Granthalaya digital platform from the National Informatics Centre (NIC), Government of India. This platform is having integrated Library Management Software (LMS) and Cloud hosting for networking to Government Libraries. Hosting of databases and the software has been made on NIC National Cloud namely, Meghraj.

The purpose of the study is to analyse computerized Library book lending services to see the nature of service, since the year of computerization, to the undergraduate passing out engineering students. It would help the policymakers to emphasize such matters that have direct influence over the service.

REVIEW OF LITERATURE

Maraddiand Kolle (2017 have studied the use of academic libraries and students' academic outcomes by collecting questionnaire data and circulation statistics from the library software system and indicated a correlation between the number of books borrowed and the academic grade point of the students. Also, they have mentioned that students who borrowed more books tended to perform well in the examination. Jabeen et al.(2018) have studied the use of information sources by college students and found that the Internet was adopted highly (60%) followed by books (50%) as information sources for the purpose of communication/discussion (60%) followed by 58.75% for examination preparation. Anees et al. (2018) have studied the impact of libraries on students' academic performance in higher education and found "irregular use of libraries by the students was one of the factors for poor scores in examination. — — study habits of the students were not proper and academic performance of the students was poor. — education remained the key factor followed by information seeking purpose for reading among boys and girls."

On the use of Library Management Software, e-Granthalaya, Jamwaland Singh (2019) have mentioned this software as the great innovation of NIC. The software has been found to work satisfactorily in many Libraries in Jammu & Kashmir as an interface among students, libraries, and books. This has also been predicted as a big boon and support to the learning process in the state. Choudhary and Singh (2020) have mentioned that the inter-library-loan service can also be provided within the libraries of the same Cluster as well in different Clusters of e-Granthalaya on the cloud with the help of acceptable conditions among the Libraries. The research activities of NSIT have been studied by different authors for different time periods. Pendamic Effect on the Research Output of Netaji Subhas University of Technology studied has been by Choudhary(2021). The author has observed a drop of 10% in the total publication by NSUT authors in the year 2020 than that in the year 2019 as one of the effects of the pandemic on research outputs of NSUT. In the literature survey, it has been found that the study on the nature of library book lending service to passing out engineering undergraduate students from any University in Delhi has not been made.

OBJECTIVES OF THE STUDY

1. To discuss the computerised Library book lending service at NSUT.

- 2. To find out the reading habits in passing out undergraduate engineering students through their interest in 'Library book lending service'.
- 3. To identify the monthly interest for 'Library book lending service'.
- 4. To discuss the nature of Library book lending service (LBLS) provided in the academic years 2016-2017 to 2020-2021

METHODOLOGY

Rao (1983) has mentioned that the common way for describing a large set of data by finding a single number isan average or typical value of that set of data. Such a value wasalso known as a measure of central tendency. It has also been referred to as a measure of location. The common measures of central tendency namely, Mean, Median, and Mode have been computed for Grouped data in this study.

Let X be the random variable for "number of times Library Book Lending Service" (No. of LBLS); $x_1, x_2, ---, x_n$ are the mid values of n class intervals; $f_1, f_2, -----$, fn are the frequencies or weights of n class intervals. Here, it has indicated the number of borrowers. Hence the weighted

mean,
$$\overline{X} = \frac{\sum_{i=1}^{n} f_i x_i}{\sum_{i=1}^{n} f_i}$$
.

A median is the value of the variable which divides the frequency curve into two equal parts. It is also called 'half-life'. The formula for the computation of Median in Grouped Data is given as

Median=
$$l + \frac{i}{f} \left(\frac{n}{2} - c\right)$$
.

Here n=total number of frequency and n/2 be the median number. Median class interval, in which (n/2)th item lies; l is the lower limit of median class; i is the width of median class; f is the frequency of median class; and c is the cumulative frequency of the class interval preceding the median class interval.

Mode is a value of the variable for which the frequency is the maximum. For grouped data, the formula of computation the mode is given as

Mode =
$$l + i \left\{ \frac{f_{m-f_i}}{(f_m - f_1) + (f_m - f_2)} \right\}$$

Here the class interval having the maximum number of frequency is called modal class interval; is the lower class limit of the 'model class'; i is the length of the model class interval; f_m is the frequency of model class interval; f_1 is the frequency of the class interval preceding to model class; f_2 is the frequency of the class interval following the model class.

When Mean, Median, and Median are identical the data are symmetrical. In the symmetrical distribution of data, the graph plotted is bell-shaped which is also known normal distribution. Skewness is the lack of symmetry and the distribution of data is called skew symmetrical distribution. Skewness gives the nature of the curve and concentration of observation about the mean. One of the important methods of a relative measure of skewness is "Karl Pearson Coefficient of Skewness (S_{t}).

Mean Deviation for grouped data is given as

M.D. = $\frac{\sum_{i=1}^{n} |x_i - \bar{x}| f_i}{\sum_{i=1}^{n} f_i}$ Here x_i is variable, f_i is number of observation.

The Variance for group data is given by σ^2 ,

$$= \frac{\sum f_i (x_i - \bar{x})^2}{\sum f_i} \quad \text{Also } \sigma^2 . = \frac{\sum x_i^2 f_i}{\sum f_i} - \bar{x}^2$$

The value of σ is standard deviation.

 S_k = [Mean – Mode]/ Standard Deviation = [3(Mean – Median)]/Standard Deviation.

The passing out undergraduate engineering in the academic years 2016-17, 2017-18, 2018-19, 2019-20 & 2020-21 have been categorized as BE2013, BE2014, BE2015, BE2016 & BE2017 respectively. The data of the book lending services to the students of different categories have been exported in excel files. The unique borrowers in each category and the number of times the services provided have been collected in the table. The statistical parameters have been used to find the objective of the study.

SCOPE OF THE STUDY

The study has been made on computerised Library book lending service provided from August 2016 to July 2021 by Central Library, NSUT Main Campus to the fourth year passingout undergraduate engineering students admitted to NSIT, presently NSUT. Library book lending service usually comprises of (a) adding the students in the library membership database, (b) issuing Library cards, (c) issuing Library documents to interested borrowers, (d) getting the lent book back from the borrower, (e) collecting overdue charge (if any) from the borrower, (f) depositing the overdue charge in University Account, (g) matching the daily document transaction data with entry-exit data, and (h) issuing Library No-dues on passing out.

SI. No.	UG engineering students admitted in year	Category	LBLS studied for the Academic Year (Aug to July)			
1	2013 -2014	BE2013	2016 to 2017			
2.	2014-2015	BE2014	2017 to 2018			
3.	2015-2016	BE2015	2018 to 2019			
4.	2016-2017	BE2016	2019 to 2020			
5.	2017-2018	BE2017	2020 to 2021			

Table 1: Categories of Engineering Students

From these activities, only the library book lending data, related to following categories of passing out undergraduate engineering students as mentioned in table 1, have been studied for describing the lending nature in UG engineering students.

DISCUSSION AND ANALYSIS

Computerised Library book lending service to undergraduate engineering students at NSUT

One of the most important Library services of NSUT Central Library namely, Library book lending has been offered using e-Granthalaya (eG4) on NIC cloud. The students admitted in a program in the same academic year have been placed in one category. For example, the students admitted in four-year engineering program in the academic year 2013-2014 have been placed in the 'BE2013' category and so on. The entitlements for lending services to a user have been defined under subcategories in eG4. This comprises the number of documents of different material types, the number of days for which particular material type can be issued, and the rate of overdue charge applicable for late return of Library materials. The two subcategories have been defined for each category of undergraduate engineering students as has been given in table 2.

When the users get the issued document reissued on the due date, the fine is not calculated. The computerised lending of library documents to the borrowers has been intimated to the borrowers by the software through email and there has also been the provision in software for SMS

SI. No.	Subcategory	Material Type	Number of Documents	No. of days	Overdue charge
1.	Undergraduate engineering student	Books	3	14	1
	General	Book Bank	2	120	1
2.	Undergraduate engineering student	Books	3	14	1
	Reserved	Book Bank	3	120	1

Table 2 : Lending Service Entitlement to Students

alert. The borrowers have been allowed, as per the provision of software, to access their account through the mobile app as well as through Web OPAC login with personal credentials for tracking the records, reading list, etc.

Reading habits in passing out undergraduate engineering students

The numbers of Library members under different categories, the number of users who borrowed Library books, which exhibited reading habits during their passing-out year have been presented in table 3.

It has been found that on average, about 44.6% passing out undergraduate engineering students from academic years 2016-2017 to 2019-2020 showed their interest in Library book lending service with the maximum (54.5%) in the year 2016-2017 and the minimum (25.2%) in 2019-2020. This has been reduced to 2.9% in 2020-2021, the year of the pandemic caused due to Covid19.

Monthly interest for 'Library book lending service

The passing out academic year has been divided into two semesters, i.e. the 7^{th} semester, and the 8^{th} semester. The 7^{th} semester was

extended from August to December with winter break and the 8th semester was extended from January to July with summer break. The numbers of lending services to the students in different categories during the months of passing out academic year have been mentioned in table 4.

It has been found that the passing out undergraduate engineering students did not show their interest in Library book lending services in June and July. The students have expressed more interest in Library book lending services during the 7th semester than that in the 8th semester. During the 7th semester, the maximum interest in the service was shown by the students in the month of September. During the 8th semester, the maximum interest for the Library service was expressed in the month of February.

Borrowers and Library Book Lending Service

It has been found with the service to the students in 7th semester and in 8th semester that few borrowers availed the Library book lending service only one time whereas few availed the service more than two dozen times. The number of times the service was availed by the students has been presented as grouped data in table 5.

	BE 2013	BE 2014	BE 2015	BE 2016	BE 2017
Library users in database	611	688	659	937	950
Passing out Academic years	2016 - 2017	2017-2018	2018-2019	2019-2020	2020-2021
Borrowers in 4 th year	333 (54.5%)	339 (49.3%)	326 (49.5)	236 (25.2%)	28 (2.9%)

Table 3: Share of Interested Students in Passing out Year for Lending Service

	Aug (%)	Sept (%)	Oct (%)	Nov (%)	Dec (%)	Jan (%)	Feb (%)	March (%)	April (%)	May (%)	June & July
BE2013 (2016-17)	138 (7.0)	652 (33.1)	197 (10)	250 (12.7)	35 (1.8)	134 (6.8)	242 (12.3)	66 (3.4)	101 (5.1)	155 (7.9)	0
BE2014 (2017-18)	181 (10.3)	693 (39.4)	233 (13.3)	168 (9.6)	18 (1.0)	27 (1.5)	224 (12.7)	57 (3.2)	99 (5.6)	57 (3.2)	0
BE2015 (2018-19)	263 (19.8)	483 (36.5)	104 (7.8)	102 (7.7)	20 (1.5)	26 (2.0)	192 (14.5)	37 (2.8)	93 (7.0)	5 (0.4)	0
BE2016 (2019-20)	139 (19.4)	167 (23.4)	53 (7.4)	74 (10.3)	27 (3.8)	104 (14.5)	144 (20.1)	7 (1.0)	0	0	0
BE2017 (2020-21)	0	5 (10.9)	0	3 (6.5)	0	1 (2.2)	25 (54.3)	12 (26.1)	0	0	0

 Table 4: Month wise Interest for Lending Service

Table 5: Students Interested in Lending Service for No. of Times

No. of times	BE2013	BE2014	BE2015	BE2016	BE2017
LBLS provided	borrowers in				
in 4th year (X)	4th year (%)				
1 to 3	122 (36.6%)	133 (39.2%)	183 (56.1%)	175 (74.2%)	27 (96.4%)
4 to 6	87 (26.1%)	116 (34.2%)	85 (26.1%)	38 (16.1%)	1 (3.6%)
7 to 9	66 (19.8%)	52 (15.3%)	37 (11.3%)	11 (4.7%)	
10 to 12	32 (9.6%)	16 (4.7%)	13 (4.0%)	7 (3.0%)	
13 to 15	10 (3.0%)	14 (4.1%)	3 (0.9%)	2 (0.8%)	
16 to 18	8 (2.4%)	4 (1.2%)	3 (0.9%)	2 (0.8%)	
19 to 21	5 (1.5%)	4 (1.2%)	2 (0.6%)	1 (0.4%)	
22 to 24	1 (0.3%)				
25 to 27	1 (0.3%)				
28 to 30	1 (0.3%)				
	333	339	326	236	28

It has been found that about half of the borrowing students under categories BE2015, BE2016 & BE2017 were interested in 1 -3 times in their 7th 8th semesters whereas in categories BE2013 & BE2014 half of borrowing students were interested in 1 - 6 times in their 7th 8th Semester. Few of the students in BE2013 categories with passing out in the academic year 2016-17 availed the service more than 21 times.

But thereafter the students were not interested in more than 21 times in Lending service. The concentration of borrowers and the number of times of the service have been presented in figure 1.

The statistical parameters for the distribution of the number of times with the borrowers have been calculated and given in table 6. The mean, median and the mode of the number of times the



Figure 1: No. of LBLS and % of Students

Statistical parameters	BE2013	BE2014	BE2015	BE2016	BE2017
Mean LBLS per borrower	6.0	5.3	4.2	3.3	1.6
Median	5.6	5.0	3.7	3	1.5
Mode	3.3	3.7	3	2.7	1
Mead Deviation (M.D.)	3.5	2.8	2.5	2	
Variance	21.3	13.8	10.2	8.5	0.81
Standard Deviation	4.6	3.7	3.2	2.9	0.9
Coefficient of variation (in %)	76.6	69.8	76.2	87	56.25
Skewness	0.6	0.4	0.4	0.2	0.7

Table 6: Tendency for Lending Service



Figure 2: Nature of Interest for Lending Service

services were provided have not been found identical so the distributions were not symmetry but skew symmetrical.

The means for all categories of the students have been found greater than the Mode so distribution was positively skewed and the right tail of distribution longer than the left tail. This has also been seen in figure 2. The nature of number of lending service to the number of BE2017 students have not been presented in the graph because they have been found about 2% among the borrowers of all the said categories of students.

Mean of the lending services of the compound samples for borrowers of the categories namely BE2013, BE2014, BE2015, BE2016 & BE207 has been calculated and it is 4.8 times lending service. The number of times of service may not be a fraction so the mean of compound samples has been found 4 times. The number of times the interest in library lending service expressed by the students with the passing-out year 2016-2017 & 2017-2018 have been found more than the mean of the compound sample.

CONCLUSIONS

The interest of passing-out undergraduate engineering students, in Library book lending service is decreasing. One of the objectives of the undergraduate engineering program should be towards developing lifelong learning. In lifelong learning, there should also be the reading habits. The reading habit should also be oriented for linking the problem of society with the skills developed in students as well as new skills and

knowledge. As it is rightly said, 'knowledge bread confidence'. The Library book lending service should be made more flexible in terms of the number of document types, the number of days, overdue charges, the addition of new titles, and in other ways, for undergraduate passing out engineering students to increase their reading habits. Also these students are in the transition phase between the University system and the new system where they are supposed to go after completing the degree. A representative of passing out undergraduate engineering students should be included in Library Committee for getting more student-centric input in the policy. The e-Granthalaya online platform has the provision to export the data in an excel file which has helped in conducting this study on reading habits. The usage data as per international standards is also made available by the publishers for subscribed e-resources. But National Digital Library of India has not made the provision for exporting the data to help the study on online reading habits. NDLI should make usages data available online to NDLI Club Admin for such purpose. The library should enrich the lending service by strengthening its collections with print books and e-books on regular basis on the subjects, interested to users.

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