The Revelation of Relationship between Library Transactions and Students' Academic Performance

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Abstract

There should be an empirical demonstration by Academic Libraries to show that library usage does contribute positively to students' academic achievement. It would add value to the effectiveness of the library in particular and institution in general. User surveys and focus group interviews are good tools for understanding user needs, expectations, and satisfaction/dissatisfactions. These can measure students' perceptions only but that does not necessarily match with real learning outcomes. Library Transactions made by the students here play a vital role in accessing their outcomes in terms of Academic Performance. The present study attempts to uncover the meaningful relationship between the students' library book transactions and their Cumulative Grade Point Average (CGPA). It could be proved that library transaction was able to put its impact on students' academic performance.

Keywords: Academic Performance, Learning Outcomes, Library Transactions, Mathematical Correlation, Silicon Institute of Technology

1. Introduction

The library plays a pivotal role in a student's educational life and intellectual life as well. Educational institution of any type has a library which caters to the information needs of its stakeholders. Student's academic achievement in terms of scoring marks in exam or completion of project/assignment depends highly on his/her library usage. Library effectiveness and students' academic success have a symbiotic relation. The academic performance of a student brings ecstasy or agony to him/her and it is well proved that library usage by the student brings all glory to him/her. Academic libraries are contributors to knowledge generation and serve a wide spectrum of knowledge seekers. Librarians and library staff provide numerous services to their users in order to address their diverse needs and interests. Both the faculty and students depend heavily on the library for information that is necessary for pursuing their individual and collective goals.

One primary objective of any library is to maximize the intensive use of its resources and services. Library materials are acquired to be used adequately in order to justify the huge amount of money invested in such resources. The effectiveness of a library as an instrument of learning is determined by the success with which it is able to provide the user with relevant information (Banleman & Adjoa, 2017). Traditionally the library's effectiveness was measured in relation to completeness and balance of the collection, the adequacy of acquisitions, cataloging, etc. In recent times, the focus has shifted

towards the other end of the knowledge communication process: the users. Customary academic library assessment practices may not be sufficient for the purpose. With the advent of online catalogues, online databases, other electronic resources, access to information and new methods of document delivery, the role of the academic library is changing. Users do not have to be physically present in the library to access the library's resources (Kuh & Gonyea, 2003)

There are several reasons for the decline in library use. Due to the development of technology, students prefer to search for information via the internet and also a variety of electronic resources have widened the potential resource base for all students. These developments have reduced face-to-face learning and usage of the library. Further less motivation by traditional lecture-based learning sessions is another reason. Sometimes students have been provided with a handful of notes and sometimes students are encouraged to use a particular text for a subject. This reduces the needs of students for further on a particular subject. (Wijesinghe et al., 2015)

Therefore, it is worth to explore whether library usage directly influences students' academic performances. In the present study, the relationship between library book transactions and academic achievement is explored at a premier engineering college Silicon Institute of Technology, Bhubaneswar, Odisha. Library transactions, wherever mentioned in the article, should be considered as Library Book Transactions.

2. Objectives of the study

- To investigate if a mathematical correlation exists between student CGPA and their Library Transactions.
- To find out the percentage of students scoring above and below the average batch CGPA against their respective frequency of Library Transactions.
- To find out the relation between library transactions and their CGPA among bright/dull students.

3. Literature Review

Literature exclusively related to the objective of the study was reviewed. Out of the total literature, some of the authenticated journal articles were reviewed and the same being depicted below.

(Jager, 1997) As part of a major investigation into the support provided by the University of Cape Town Library Service for both the studying and research activities at the university, an investigation was launched to establish objectively whether any statistically significant association could be shown to exist between student academic performance and library use. It was revealed that, by comparing the students' examination results and library borrowing records at the University of Cape Town, the best academic performance used the most library materials and that those with low or failing grades used significantly fewer.

(Wong & Webb, 2011) Academic libraries must demonstrate empirically that library usage does contribute positively to student academic performance and, thereby, to the university's effectiveness. While customary academic library assessment practices may not be sufficient for this purpose, the Hong Kong Baptist University (HKBU) Library undertook an experimental project, which intended to establish a mathematical correlation between student library material usage and their cumulative grade point average (GPA). Taking 2007

to 2009 graduates as samples, with 8,701 pairs of data, the HKBU Library was able to demonstrate its impact on student learning outcomes.

Cox & Jantti, (2012) revealed that a strong correlation between students' grades and the use of information resources the library provides. The average mark for students who never used UWL electronic resources in 2011 was 55. The average mark for students who spent up to one hour a week accessing UWL electronic resources per year was 61. A very strong nonlinear relationship between average usage of resources and average student marks is observed.

Basheer & Razzaq, (2012) depicted that College library has a positive impact on the student academic achievement. Library support students in the way that they able to complete their study tasks by the library resources. Students find the effectiveness of the library which helps them in their constructive skills and plays the essentials to their academic achievements. The library helps them in completing their routine and semester projects and educational works.

Stone & Bryony, (2013) revealed that, there is a statistically significant correlation across a number of universities between library activity data and student attainment. E-resources usage, library borrowing statistics, and library gate entries were measured against the final degree award for 33,074 undergraduate students across eight U.K. universities. The research successfully demonstrated a statistically significant relationship between library resource use and level of degree result; however, the authors opined that any conclusions drawn are not indicators that library usage and student attainment have a causal relationship.

Allison, (2015) reported the results from a two-year study that analyzed library use through checkouts and off-campus access to full-text resources against grade point averages (GPAs) of undergraduates and graduates at a large Midwestern library. The study found that undergraduates with a GPA above the mean university GPA used the library more than those with a GPA below the mean. There was a correlation between greater use of the library and increases in GPA between the two i.e., as one grew, so did the other.

Wijesinghe et al, (2015) studied to find out the relationship between library usage and educational performance. The study was mainly undertaken to explore the impact of library usage on an undergraduate's GPA. The questionnaires were distributed among 160 undergraduates using a cluster sampling method. The result of the study reveals that there is a positive relationship between university library usage and educational performance.

(Philomena, 2016) The study examined the use of the library and students' academic achievement at the University of Lagos, Nigeria through a descriptive research survey among 120 randomly selected students. Two hypotheses were formulated and tested at 0.05 level of significance. The findings showed that there exists a significant association between library use and students' academic achievement. Besides, the study also revealed a significant association between counseling and students' use of the school Library. It was recommended that school counselors should proactive in tackling the issue of non-use of the school Librarian in the tertiary institutions across Nigeria.

Stemmer & David, (2016) studied to demonstrate the value of an academic library that brings to student learning and student outcomes. Using regression techniques, the study identifies multiple significant correlations, both posi-tive and negative, between student use of the library and student learning and outcomes as measured by retention, graduation, and grade point av-erage (GPA). The library factors associated with student outcomes change over the course of the four-year undergraduate experience. The authors opined that the methods used in this study could be a model for other institutions seeking a means for assessing the library's relationship to student learning and outcomes.

Banleman & Adjoa, (2017) studied the impact of library usage on academic achievement and performance of students. Usage statistics gathered at the WA campus library showed that students who use the library have a higher CGPA and higher academic performance than non-library users. The findings revealed that students' use of the library is statistically significant to student grade point average (CGPA), and that access to electronic resources will be the most beneficial resource students should have to attain excellent academic performance and development.

4. Methodology

Silicon Institute of Technology (SIT), a premier Engineering Autonomous College in Bhubaneswar, Odisha is offering B.Tech degree in four disciplines namely Electronics & Telecommunication Engineering (ET), Electrical & Electronics Engineering (EE), Computer Science Engineering (CS), Information Technology Engineering (IT) and Applied Instrumentation Engineering (AI). The Central Library of SIT caters to the information needs of the students, faculties and research community through the in-house automated system. As the library house-keeping operations are fully automated, all the transaction records of the students were collected from the log files and filtered. Similarly, the CGPA scores of the students were also collected from the academic database as the data source for conducting the study. The transaction frequencies and CGPA scored by the students were mapped for drawing the inferences as per the objective of the present study.

4.1 Scope of the Study

The transaction records of the B. Tech pass out batch, during the year 2019 and their respective CGPAs were analyzed and inferences were drawn. Total of 503 pairs of datasets involved. Each pair of the dataset includes a student's transaction record and his / her CGPA. The student distribution in their respective disciplines is depicted in Table – 1. The distribution depicts that he Discipline ET has maximum strength 169 (33.6%) followed by CS (110, 21.9%) whereas the strength of both AI and IT is the same (53, 10.5%).

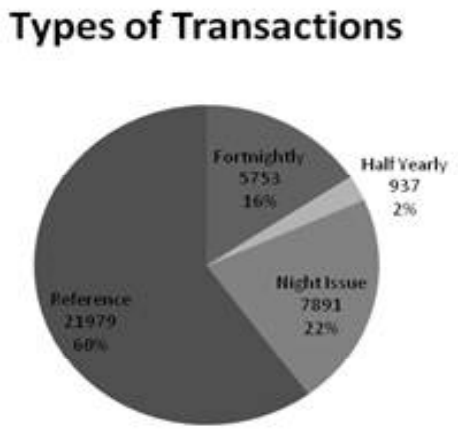
Table – 1: Discipline wise student strength

Discipline	Allotted Seats	Strength	%
AI	60	53	10.5
CS	120	110	21.9
EE	120	118	23.5
ET	180	169	33.6
IT	60	53	10.5
Total	**540**	**503**	**100**

5. Observation, Analysis & Major Findings

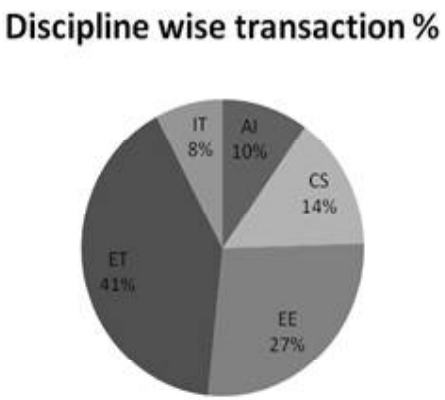
The transaction records include the library book transactions made by the students of 2019 pass out batches. Students can make book transactions by four different ways like, Fortnight issue (students can issue maximum of two books for two weeks), Half-yearly issue (students can issue maximum of seven no of books for one semester), Night Issue mode (students can issue one book for one night) and Reference issue (students can issue as many numbers of books as they wish but at a time four books only). Excepting Reference issue, all other issues are for home reading purposes for the students. The Reference issue is made by the students for reading in the reading room during library hours.

The Graph – 1 shows the varieties of transactions students made during their four years of B. Tech programme. Total 36560 no of book transactions made by the students. Out of which Reference issue shares the maximum (21279, 60%) followed by Night issue (7891, 22%) and Fortnight issue (5753, 16%). The Half Year issue is the least (937, 2%). It is clearly understood that students prefer more books to transact in Reference mode i.e., issue books and read in the reading room during library hours. Perhaps it is due to the excellent reading room facility provided by the library.



Graph 1: Types of Transactions

The Graph – 2 reflect the discipline wise transaction records in percentage. It shows that ET having a maximum of 41%, followed by EE, CS, AI and IT with 27%, 14%, 10%, and 8% respectively.



Graph – 2: Discipline wise transaction %

The transaction data revealed (as depicted in Table – 2) that, in all the Disciplines, Reference transaction is maximum and that through a Half-year transaction is least. The Reference transaction is highest in IT discipline (65.95%) followed by AI (61.73%), EE

(60.24%), ET (59.99%) and CS (56.05%). Percentage of Fortnight transaction made maximum times by CS (17.69 %) followed by AI (17.43 %), EE (15.72%), ET (15.63%) and IT (10.53%). The transactions made by Night Issue reveal that EE as top among the disciplines (22.99%) followed by IT (22.50%), CS (22.47%), ET (22.22%) and AI (18.58%).

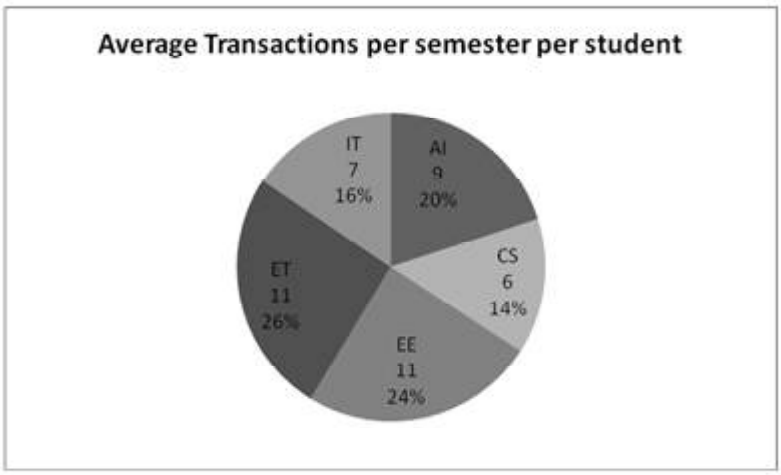
Table 2: Discipline wise transactions by student

Issue Type	AI		CS		ET		EE		IT		Grand Total	
	F	%	F	%	F	%	F	%	F	%	F	%
Fortnight	633	17.43	942	17.69	2319	15.63	1560	15.72	299	10.53	5753	15.74
Half Yearly	82	2.26	202	3.79	320	2.16	304	3.06	29	1.02	937	2.56
Night Issue	675	18.58	1197	22.47	3297	22.22	2083	20.99	639	22.50	7891	21.58
Reference	2242	61.73	2985	56.05	8900	59.99	5979	60.24	1873	65.95	21979	60.12
Grand Total	**3632**	100	**5326**	100	**14836**	100	**9926**	100	**2840**	100	**36560**	100

The transaction data were further analyzed to find the average transactions per semester. As the B. Tech degree, in every discipline understudy, is of 8 semesters the average transactions per semester were found to be 4570 and the descending order of average transaction made among the five disciplines shows the pattern ET > EE > CS > AI > IT. Table – 3 & Graph – 3 depicts the average transaction per semester per student was found out by considering the average transactions per semester and no of students (refer Table – 1). The same is maximum 11 by both EE and ET discipline and 9, 7 & 6 are respectively for AI, IT and CS respectively.

Table 3: Discipline wise average transactions

Branch	Total Transaction	%	Average transactions Per semester	Average transactions per semester per student
AI	3632	9.9	454	9
CS	5326	14.6	666	6
EE	9926	27.1	1241	11
ET	14836	40.6	1855	11
IT	2840	7.8	355	7
Total	36560	100.0	4570	



Graph 3: Average Transactions per semester per student

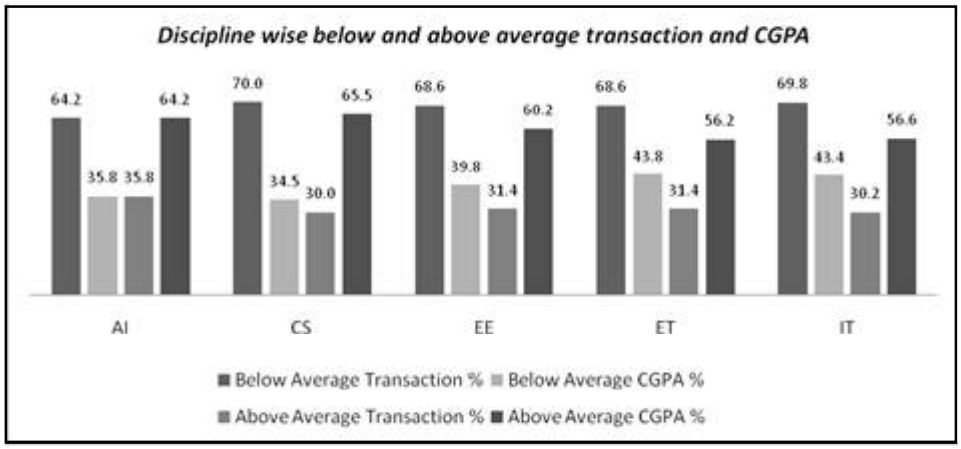
Table – 4 depicts the descriptive statistics of the transaction and CGPA data. The average transactions of ET discipline are highest (87.7) with Standard Deviation 112.1. The maximum and minimum transactions are 623 and 4 respectively. EE discipline followed ET with 84.1 average transactions with Standard Deviation 106.3 and the minimum and maximum transactions are 1 and 660 respectively. AI discipline is having 68.5 average transactions with standard deviation 72.3, the maximum and minimum transactions are 3 and 363 respectively. IT discipline is having average transactions as 53.5 with a standard deviation of 77.1. The maximum and minimum transactions are 4 and 388 respectively. The CS discipline has the lowest average transaction 48.4 with standard deviation 64.9 and the minimum and maximum transactions are 1 and 494 respectively.

Table 4: Descriptive Statistics of Transaction records vs CGPA Discipline wise

Branch	Avg. Transaction	SD	Min	Max	Avg CGPA	SD	Min	Max	Total
AI	68.5	72.3	3	363	6.7	1.8	1.6	8.9	53
CS	48.4	64.9	1	494	7.8	1.2	1.8	9.1	110
EE	84.1	106.3	1	660	7.1	1.3	3.1	8.9	118
ET	87.7	112.1	4	623	7.3	1.3	3.3	9.1	169
IT	53.5	77.1	4	388	7.6	0.9	4.4	8.9	53

The CGPA data of students of 5 disciplines under study were analyzed. It was observed that the average CGPA for CS discipline is highest with 7.8 followed by IT (7.6), ET (7.3), EE (7.1) and AI (6.7). The standard deviation was lowest 0.9 in IT discipline followed by 1.3 each in EE and ET, 1.2 in CS and highest 1.8 in AI. The maximum and minimum CGPA discipline wise were also analyzed. It was observed that CS and ET maximum CGPA 9.1 each with a minimum of 1.8 and 3.3 respectively. AI, EE, and IT discipline have 8.9 maximum CGPA each with minimum CGPA 1.6, 3.1 and 4.4 respectively.

The percentage of students who scored below and above average Library Transactions and CGPA are analyzed and depicted by the Graph – 4. The below-average transactions for CS discipline are highest (70.0%) followed by IT (69.8%), ET & EE both (68.6%), and lowest AI (64.2%). The CGPA below average is highest for ET (43.8%) followed by IT (43.4%). EE, AI, and CS disciplines have below-average 39.8%, 35.8%, and 34.5% respectively. It is observed that the above-average CGPA is much higher than that of Library Transactions. In CS discipline 65.5% of students have above average CGPA followed by 64.2% by AI, 60.2 % by EE, 56.6 % IT and 56.2 % ET.



Graph 4: Discipline wise below and above average transaction and CGPA

5.1 Discipline wise Library Transaction Vs CGPA

The 503 pairs of data were analyzed and tabulated; keeping in view the library transactions made by the students and CGPA scored, discipline wise. The library transactions and CGPA of students are categorized as per the convenience and the data so analyzed are tabulated below.

In IT discipline (Table – 5) it is observed that 20 (37.7%) of students scored CGPA between 8-9 and 7-7.9 both. Only 11 (20.8%) of students scored CGPA 6-6.9 and 4-4.9 and 5-5.9 CGPA have been scored by one student each (1.9%). The transactions range 11-20 and have a maximum 30.2% score, followed by 21-30 (22.6%). Highest range i.e., 301-400 only 2 (3.8%) students have made the transactions.

Table 5: IT – Library Transaction Vs CGPA

Branch - IT							
Transactions Range	**CGPA (Range)**					**Total**	**%**
	8-9	**7-7.9**	**6-6.9**	**5-5.9**	**4-4.9**		
1-10		3	2			5	9.4
11-20	5	7	4			16	30.2
21-30	3	5	2	1	1	12	22.6
31-40	1	1	1			3	5.7
41-50						0	0.0
51-100	7	2	2			11	20.8
101-150	2					2	3.8
151-200		1				1	1.9
201-250						0	0.0
251-300		1				1	1.9
301-400	2					2	3.8
401-500						0	0.0
501-600						0	0.0
601-700						0	0.0
Total	20	20	11	1	1	53	100
%	37.7	37.7	20.8	1.9	1.9		

In ET discipline (Table – 6) 77 (45.6%) students have CGPA 8-9, followed by 38 (22.5%) having CGPA range 7-7.9. In CGPA range 6-6.9, 30 (17.8%) students are there. Whereas in range 5-5.9 and 4-4.9, 10 (5.9%) students are there. The transaction range 51-100 has a maximum of 36 (21.3%) score, followed by 11-20 range 32 (18.9%). There is one student whose transaction range is between 601-700, followed by 3 & 2 students in range 501-600 and 401-500 respectively.

Table 6: ET – Library Transaction Vs CGPA

Transactions Range	**Branch - IT**							
	CGPA (Range)						**Total**	**%**
	8-9	**7-7.9**	**6-6.9**	**5-5.9**	**4-4.9**	**3-3.9**		
1-10	1	5	7	2	3	1	19	11.2
11-20	9	8	8	2	3	2	32	18.9

21-30	6	4	4		2		16	9.5
31-40	2	3	2	2		1	10	5.9
41-50	7	2	2				11	6.5
51-100	20	6	5	4	1		36	21.3
101-150	9	5	1				15	8.9
151-200	9	3					12	7.1
201-250	4	1			1		6	3.6
251-300	1		1				2	1.2
301-400	3	1					4	2.4
401-500	2						2	1.2
501-600	3						3	1.8
601-700	1						1	0.6
Total	77	38	30	10	10	4	169	100
%	45.6	22.5	17.8	5.9	5.9	2.4		

EE discipline (Table – 7) has a maximum of 44 (37.3%) of students whose CGPA range is 7-7.9 followed by 34 (28.8%) students with CGPA range 8-9. In range 6-6.9, 21 (17.8%) students are there followed by 10 (8.5%) in range 4-4.9 CGPA. Highest transaction range is 51-100, 22 (18.6%) followed by 11-20 (16.9%). Only one student has a transaction range of 601-700. There are 3 & 2 students having transaction range 301-400 and 401-500.

Table 7: EE – Library Transaction Vs CGPA

Transactions Range	Branch - IT							
	CGPA (Range)							
	8-9	7-7.9	6-6.9	5-5.9	4-4.9	3-3.9	Total	%
1-10		3	1		3	1	8	6.8
11-20	2	10	4	2	1	1	20	16.9
21-30	1	6	3	1	4		15	12.7
31-40	4	4	4		2		14	11.9
41-50	4	1	2				7	5.9
51-100	8	9	2	2		1	22	18.6
101-150	7	6	2	1			16	13.6
151-200	2	1					3	2.5

201-250	1	2	1				4	3.4
251-300		2	1				3	2.5
301-400	2		1				3	2.5
401-500	2						2	1.7
501-600							0	0.0
601-700	1						1	0.8
Total	34	44	21	6	10	3	118	100
%	28.8	37.3	17.8	5.1	8.5	2.5		

CS (Table – 8) discipline has a maximum of 69 (62.7%) of students whose CGPA range is 8-9 followed by 24 (21.8%) students with CGPA range 7-7.9. Highest transaction range is 11-20, 34 (30.9%) followed by 51-100 (15.5%). The transaction range 401-500 and 301-400 has only one student each.

Table 8: CS – Library Transaction Vs CGPA

Branch - CS

Transactions Range	**CGPA**								**Total**	**%**
	8-9	**7-7.9**	**6-6.9**	**5-5.9**	**4-4.9**	**3-3.9**	**2-2.9**	**1-1.9**		
1-10	5	3	1	1	2	1			13	11.8
11-20	19	7	4	2		1		1	34	30.9
21-30	10	4	1						15	13.6
31-40	5	3			1				9	8.2
41-50	7	1		1					9	8.2
51-100	12	4	1						17	15.5
101-150	5	2							7	6.4
151-200	4								4	3.6
201-250									0	0.0
251-300									0	0.0
301-400	1								1	0.9
401-500	1								1	0.9
501-600									0	0.0
601-700									0	0.0
Total	69	24	7	4	3	2	0	1	110	100
%	62.7	21.8	6.4	3.6	2.7	1.8	0.0	0.9		

AI (Table – 9) discipline has a maximum of 17 (32.1%) students with CGPA range 8-9 followed by 14 (26.4%). There are 7 & 6 students with CGPA range 6-6.9 and 5-5.9. Transaction range 11-20 and 51-100 has a maximum of 9 (17.0%) followed by a 101-150 transaction range with 8 (15.1%).

Table 9: AI – Library Transaction Vs CGPA

Branch - AI

Transactions Range	CGPA								Total	%
	8-9	7-7.9	6-6.9	5-5.9	4-4.9	3-3.9	2-2.9	1-1.9		
1-10	1	1		1	1			1	5	9.4
11-20		1	3	2	1	1		1	9	17.0
21-30	3		1	2	1				7	13.2
31-40	1	2							3	5.7
41-50	3	1	1	1	1				7	13.2
51-100	1	5	1		1			1	9	17.0
101-150	5	3							8	15.1
151-200	1	1							2	3.8
201-250	1								1	1.9
251-300			1						1	1.9
301-400	1								1	1.9
401-500									0	0.0
501-600									0	0.0
601-700									0	0.0
Total	17	14	7	6	5	1	0	3	53	100
%	32.1	26.4	13.2	11.3	9.4	1.9	0.0	5.7		

5.2 Library Transactions Vs CGPA: Bright vs Dull Students

Transactions data with CGPA of students were analyzed keeping in view the bright students having CGPA range 7-9 and dull students with CGPA range 1-6. The following tables show the bright vs dull student CGPA and their library transactions records.

The data as depicted in Table – 10 reveals that in each discipline students with CGPA range 7-9 have maximum library transactions like in IT is 40 (75.5%), ET is 106 (62.7%), EE is 78 (66.1%), CS is 93 (84.5%) and in AI is 31 (58.5%).

Table 10: Library Transaction Vs CGPA

Branch	IT		ET		EE		CS		AI	
Library Transactions	CGPA Range		CGPA Range		CGPA Range		CGPA Range		CGPA Range	
	7-9	1-6	7-9	1-6	7-9	1-6	7-9	1-6	7-9	1-6
1-10	3	2	6	13	3	5	8	5	2	3
11-20	12	4	17	15	12	8	26	8	1	8
21-30	8	4	1	6	7	8	14	1	3	4
31-40	2	1	5	5	8	6	8	1	3	
41-50			9	2	5	2	8	1	4	3
51-100	9	2	26	1	17	5	16	1	6	3
101-150	2		14	1	13	3	7		8	
151-200	1		12		3		4		2	
201-250			5	1	3	1			1	
251-300	1		1	1	2	1				1
301-400	2		4		2	1	1		1	
401-500			2		2		1			
501-600			3							
601-700			1		1					
Total	40	13	106	45	78	40	93	17	31	22
%	75.5	24.5	62.7	26.6	66.1	33.9	84.5	15.5	58.5	41.5
Grand Total	**53**		**151**		**118**		**110**		**53**	

Library transactions ranges were divided into two categories (1-200) and (201-700) and students with CGPA range 7-9 and 1-6 are analyzed. The analysis is tabulated in Table – 11, which reveals that in each discipline, a maximum number of students have transaction range 1-200. CS discipline has a maximum of 91 students with CGPA range 7-9 with a transaction range 1-200. Followed by ET with 90, EE with 68, IT with 37 and AI with 29. In transaction range 201-700 ET discipline has a maximum of 16 students followed by 10 in EE, 3 in IT, 2 in CS and AI both.

Table 11: Library Transaction of Bright vs Dull Students

Branch	IT		ET		EE		CS		AI	
Library Transactions	CGPA Range		CGPA Range		CGPA Range		CGPA Range		CGPA Range	
	7-9	1-6	7-9	1-6	7-9	1-6	7-9	1-6	7-9	1-6
1-200	37	13	90	43	68	37	91	17	29	21
201-700	3	0	16	2	10	3	2	0	2	1
Total	40	13	106	45	78	40	93	17	31	22
%	75.5	24.5	62.7	26.6	66.1	33.9	84.5	15.5	58.5	41.5
Grand Total	**53**		**151**		**118**		**110**		**53**	

5.3 Relation between CGPA and Transaction of Students: Discipline wise

For each discipline group, Pearson's Correlation for analysis was used. This method is the most common method used to determine the degree of linear dependence between two variables (which were CGPA and Transaction in this study). The classic interpretation of the correlation coefficients (R) in behavioral sciences was established by Cohen first in 1983 (Wong & Webb, 2011).

All the 503 pairs of data were analyzed discipline wise to find out the Pearson's Correlation Coefficients to find out the relation between the transaction data with CGPA score to uncover the meaningful relation between library transactions and student's academic performance in terms of CGPA score. For this purpose, the online tool available at https://www.socscistatistics.com/tests/pearson/default2.aspx was used. This allows to key in the data and getting the Pearson's Correlation Coefficients with graphical representations (Scatter Chart) as well. Table -12 depicts the values which show AI with a maximum 0.3748 followed by ET, IT, EE and CS with 0.3691, 0.2911, 0.2704 and 0.2375. For drawing Scatter Chart Transactions frequency were taken as X – Values and CGPA score as Y – Values in each case.

Table12: Pearson's Correlation Coefficients of Transaction and CGPA Discipline wise

Branch	Pearson's Correlation Coefficients	No of Pairs
AI	0.3748	53
CS	0.2375	110
EE	0.2704	118
ET	0.3691	151
IT	0.2911	53

For IT Discipline (Figure – 1) R is 0.2911, P-Value is 0.344. The result is Significant at P<0.5. Although technically a positive correlation, the relationship between the variables is weak.

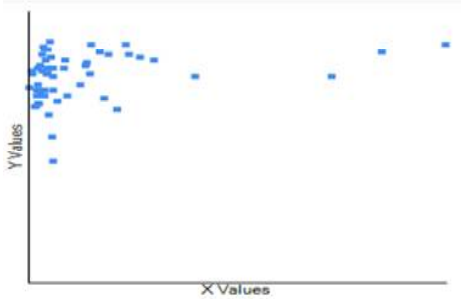


Figure 1: Scatter Chart for IT Discipline

For ET Discipline (Figure – 2) R is 0.3691, P-Value is <0.00001. The result is significant at P<0.05. Although technically a positive correlation, the relationship between the variables is weak.

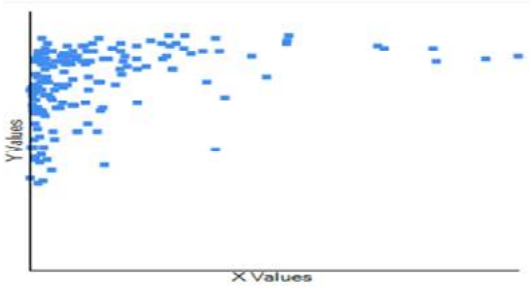


Figure 2: Scatter Chart for ET Discipline

For EE Discipline (Figure – 3) R is 0.2704, P-Value is 0.0031. The result is significant at P<0.05. Although technically a positive correlation, the relationship between the variables is weak.

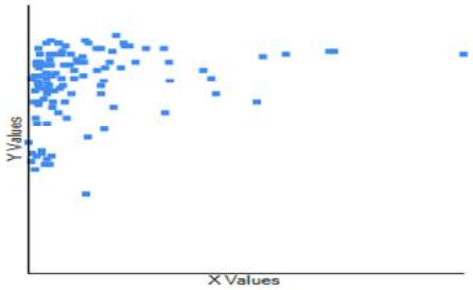


Figure 3: Scatter Chart for EE Discipline

For CS Discipline (Figure – 4) R is 0.2375, P-Value is 0.0125. The result is significant at P<0.05. Although technically a positive correlation, the relationship between the variables is weak.

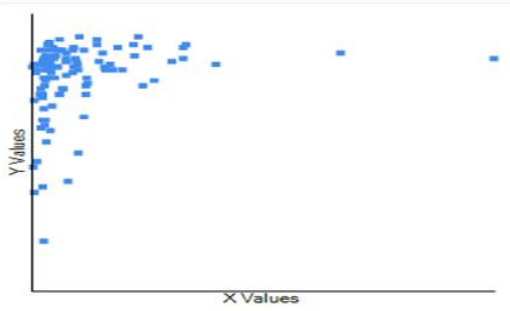


Figure 4: Scatter Chart for CS Discipline

For AI Discipline (Figure – 5) R is 0.3748, P-Value is 0.0057. The result is significant at P<0.05. Although technically a positive correlation, the relationship between the variables is weak.

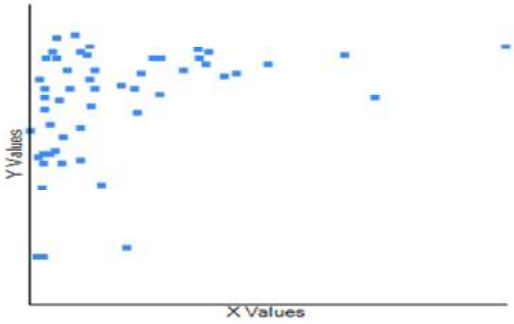


Figure 5: Scatter Chart for AI Discipline

The 503 pairs of sample data among the 5 disciplines are hence proven to have a positive relationship between CGPA and Transaction records. The correlation coefficient (R) among the disciplines ranged from 0.2704 (EE discipline) to 0.3691 (ET discipline).

6. Conclusion

From the results, it can be concluded that most of the students irrespective of the five disciplines do library transactions and they score higher CGPA accordingly and vice versa. No matter which factor

may be the cause or determinant of the relationship between the CGPA and library transactions, it is proved that these two factors are positively correlated across the disciplines. This study can serve as a strong evidence to showcase the institution that the library plays an important role in student learning and their academic success. It cannot be denied the proven fact that the students who have higher CGPA have also more transactions. Thus, the study clearly shows the importance of the library in students' academic achievement. The study may be used as a helpful method to justify the budget towards the monograph of the institution. Even though we are in the internet era, the results demonstrate that students are still heavily reliant on books. This confirmed idea can also help collections development in a library in terms of books.

7. Limitations & Suggestions

Correlation analysis can only reflect the relationship between two sets of data, Correlation tests cannot tell the cause-and-effect relationship. Therefore, through this study, we cannot simply conclude that the transaction frequency is statistically proven to be one of the determinant factors of a higher CGPA for the B.Tech Graduates under study. Another possible scenario could be that the students who have higher CGPAs tend to have more library transactions. Yet the present study and the results so depicted are still meaningful in various aspects. It may be suggested that library transactions including books, journals, magazines and considering the record of access to e-resources and other multimedia resources could be taken into consideration to know its influence on the students' academic performance. Moreover, many a times students come to the library with their personal resources to study, they don't issue any items from the library but only use library reading room facilities. In that case, the time spent by a student in the library may be taken into considerations.

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