

Metric Analysis on Electronic Theses and Dissertations of Central Universities, India in INFLIBNET Shodhganga Repository

Dr. K. S. Sivakumaren

Dr.S.Bharanidharan

Dr. T. Rajkumar

ABSTRACT-

Dr. K. S. Sivakumaren
Deputy Librarian
Anna University, MIT Campus
Chrompet, Chennai-600044.
Tamil Nadu, India.
Email:sivamit_kumaren@outlook.com

Dr.S.Bharanidharan
Computer Scientist
University Library,Anna University
Chennai-600025
Email: s_bharani@annauniv.edu

Dr. T. Rajkumar
Chief Librarian
Woxsen University,Kamkole, Sadasivpet,
Hyderabad, Telangana, India, 502345.
Email:trajkumarkvp@gmail.com

This paper examines the Electronic Theses and Dissertations (ETD) of Central Universities in INFLIBNET Shodhganga Repository. The study has analyzed the Electronic Theses and Dissertations (ETDs) produced and deposited in the Shodhganga repository by the top ten Central Universities. It is found that 39392 Electronic Theses and Dissertations (ETDs) were deposited on various subject disciplines in the Shodhganga repository. Among the top ten Central Universities, Aligarh Muslim University has deposited the highest number of Theses and Dissertations (9488, 24.09). Jawaharlal Nehru University has been found in the second place to deposit more number of ETDs (5446, 13.83%). School of International Studies, Jawaharlal Nehru University has been identified has contributed the highest number of ETDs (1283, 23.56%) at the department level. Further, it is studied that the 83.18% of ETDs written in English language were deposited highly. The NBA, NAAC, NIRF and other statutory bodies should come forward to award some academic credentials for the publications of the Universities while assessing the institutions for grant of accreditations and ranking, since, publication of the institutions is considered as one of the parameter for accreditation and ranking.

Keywords: Electronic Theses and Dissertations, ETDs, Shodhganga, INFLIBNET, Central University

INTRODUCTION

Electronic theses and dissertations (ETDs) represent a relatively new mode of research and scholarly communication, becoming a crucial component of library services worldwide. Many Indian higher education institutions are actively engaging in the implementation of ETDs. Advances in information and communication technology (ICT) have revolutionized the organization, processing, and dissemination of information to end users. The advent of Open Access has facilitated easy access to information in the digital environment. Educational institutions have begun depositing their content in digital formats within Institutional Repositories (IR), making these resources available to users (Sivakumaren, 2015)¹. Globally, doctoral research programs are considered fundamental to the advancement of higher education, with universities playing a pivotal role in shaping proficient researchers at various career stages. Indian universities significantly contribute to the generation and dissemination of knowledge through rigorous research activities and the production of PhD theses, which serve as critical information sources. Annually, India awards approximately

8,000 to 10,000 PhDs, aiming to provide students with valuable research experience that enhances their understanding of how new knowledge is developed and communicated within their fields. PhD theses encompass substantial content, including comprehensive literature reviews and detailed research findings that are often not available elsewhere. However, Indian thesis literature faces several challenges, such as the absence of systematic acquisition, limited access, uncertain publication practices, and the rapid growth in the number of theses (Shalini Urs, 1999)². In contrast, Western nations have already addressed these issues through concerted efforts (Vijayakumar, Murthy & Khan, 2004)³. Addressing these challenges in India will require similar dedicated efforts to enhance the accessibility and organization of this valuable scholarly resource.

REVIEW OF LITERATURE

Sivakumaren & Rajkumar (2021)⁴ found that Sweden had contributed the highest number of ETDs 2073 (30.24%) on Library and Information Science (LIS) in OATD.org. University of Borås had contributed 900 (27.70%) of theses than other Universities/Institutions. The department of Swedish School of Library and Information Science has contributed the highest number of theses 819(33.55%). English was found the dominating language, in which, 4204 (56.86%) of theses were found in OATD.org.

Wani (2019)⁵ studied the Open Access Electronic Thesis and Dissertation (OAETD) repositories available at oatd.org, on the basis of various parameters like structure, content support, technical and operational feasibility. The findings of the study is showing an increasing trend. Moreover there is scope for further improvement in technical and operational feasibility of OAETD repositories.

Jeyapragash, Rajkumar & Muthuraj (2016) ⁶ examined the Electronic Thesis and Dissertations (ETDs) deposited at INFLIBNET Shodhganga project by Indian Universities. The study found that the top ten Universities contribution, ETD year wise growth, ETD Contribution by Major Subject wise, Growth of theses on subjects by year wise (2010-

2015), and also found on ETD Growth on subjects in 2015.

Sivakumaren (2015)⁷ examined the Electronic Thesis and Dissertations (ETDs) deposited at INFLIBNET Shodhganga project by Indian Universities. It is found that 32000+ theses have been deposited on various disciplines by 201 Universities. The study considered only top five Universities ranked by INFLIBNET Shodhganga project. It is found the top five Universities have contributed 3145 theses in the repository.

Ezema&Ugwu (2013)⁸ examined the adoption of ETD in Nigerian university libraries is very low. Nigerian universities must therefore adopt a pragmatic approach to develop an ETD program that will facilitate the dissemination of research documented in theses and dissertations. Ramdas & Lihitkar (2014)⁹ made a comparative study on ETDs in India and found that institutional repositories are gaining momentum today. India is moving ahead in this direction and major education and research institutes have already created their own institutional repositories.

In the same way, in Indian perspective growth and development of ETDs was investigated by Khaparde & Ambedkar (2014)¹⁰. Main objective was to study the composition and built of e-theses repositories in India and to discuss national policy framework in India for building ETD repositories. Investigators conclude that there is a need to organize ETD awareness programs to improve an understanding of the issues and options for the institutions planning to implement ETD repositories.

Sheeja & Cherukodan (2011)¹¹ discussed the development and promotion of ETDs in Kerala. This study examines the ETD project of Cochin University of Science and Technology (CUSAT) and Mahatma Gandhi University (MGU). They found that both institutions have promoted ETDs by organizing workshops, adopting open source software, and training library staff.

Ahmed, Alreyaee & Rahman (2014)¹² conducted a study on theses and dissertations in institutional

repositories. Major findings made by the study are access to theses and dissertations are often restricted to parent institution only. The authors found that ETDs are addressing this problem by making institutional knowledge available online and thereby not only increasing its visibility and use, but also making them contribute to the impact and ranking of their institutions.

It is inferred that more number of studies were carried out on electronic theses and dissertations after 2011. The results of the show that there is an increasing trend in the research contributions by the Universities.

OBJECTIVES OF THE STUDY

- To examine the growth rate in terms of contributions of Electronic Theses and Dissertations (ETDs) deposited by the top ten Central Universities in the INFLIBNET Shodhganga Repository.
- To analysis the number of ETDs produced by various departments of Central Universities.
- To find out the number of ETDs produced in English language.
- To study the year wise growth of ETDs.
- To identify the annual growth rate (AGR) and (CAGR) of ETDs.

METHODOLOGY

The data for the study were extracted from Shodhganga @ INFLIBNET Centre (<https://shodhganga.inflibnet.ac.in/>) on 15-5-2023. The study is focused only the contributions of Electronic Theses and Dissertations in Shodhganga Repository. Further, the data thus collected were divided into four major categories as “overall contributions, department level contributions and contributions on English Language and Year of Completion of ETDs. The data extracted were exported to Ms-Excel for analysis. The data were analysed to find out Annual Growth Rate(AGR) and Compound Annual Growth Rate (CAGR) of the research in the Central Universities of India.

ANALYSIS AND INTERPRETATIONS OF DATA

ETDs of Central Universities

Generally, the Universities are highly involved in the research on various disciplines. In the research, a lot of new inventions are being brought to the society and it leads to the further research. Thus, the results are being published as research reports and submitted to the common platform “Shodhganga”. It helps the researchers and academicians to get information on various disciplines. In this study, the research reports submitted in the form of “Theses and Dissertations in the UGC INFLIBNET “Shodhganga” project by the top ten Central Universities of India were considered and analyzed the data. “Electronic Theses and Dissertations” deposited in the “Shodhganga” are listed in Table 1.

Table 1 shows that 39392 number of “Electronic Theses and Dissertations”(ETD) of Central Universities of India deposited in the “Shodhganga Project”. Among the top 10 Universities, “Aligarh Muslim University” has deposited the highest number of ETD (9488). “Banaras Hindu University” has contributed the second highest number of publications(5699), which is followed by “Jawaharlal Nehru University (5446) and “University of Delhi”(4929). It is resulted that 2512 number of ETD of North-Eastern Hill University has been found in the fifth rank among the top ten Universities. It is interfered that that the top ten Universities have deposited 28074(71.28%) of their ETD, whereas, the reaming Universities have deposited only 11318(28.72%) of their ETD in the Shodhganga project.

ETDs By University Departments

In University System, the research and development activities are being done at department level. However, in some cases, the research has been done in collaboration with other Universities and Departments. In this study, the Electronic Theses and Dissertations of various departments of Central Universities deposited in the Shodhganga Project have been analyzed and the results are shown in Table 2.

Table 1: ETDs of Central Universities

S. No.	University	Nos.	%	Rank	Total
1	Aligarh Muslim University	9488	24.09	1	28074 71.28%
2	Banaras Hindu University	5699	14.47	2	
3	Jawaharlal Nehru University	5446	13.83	3	
4	University of Delhi	4929	12.51	4	
5	North-Eastern Hill University	2512	6.38	5	
6	University of Hyderabad	2385	6.05	6	11318 28.72%
7	Pondicherry University	2356	5.98	7	
8	University of Allahabad	2235	5.67	8	
9	Dr. Harisingh Gour Vishwavidhyalay	2192	5.56	9	
10	Assam University	2150	5.46	10	
	Total	39392	100		

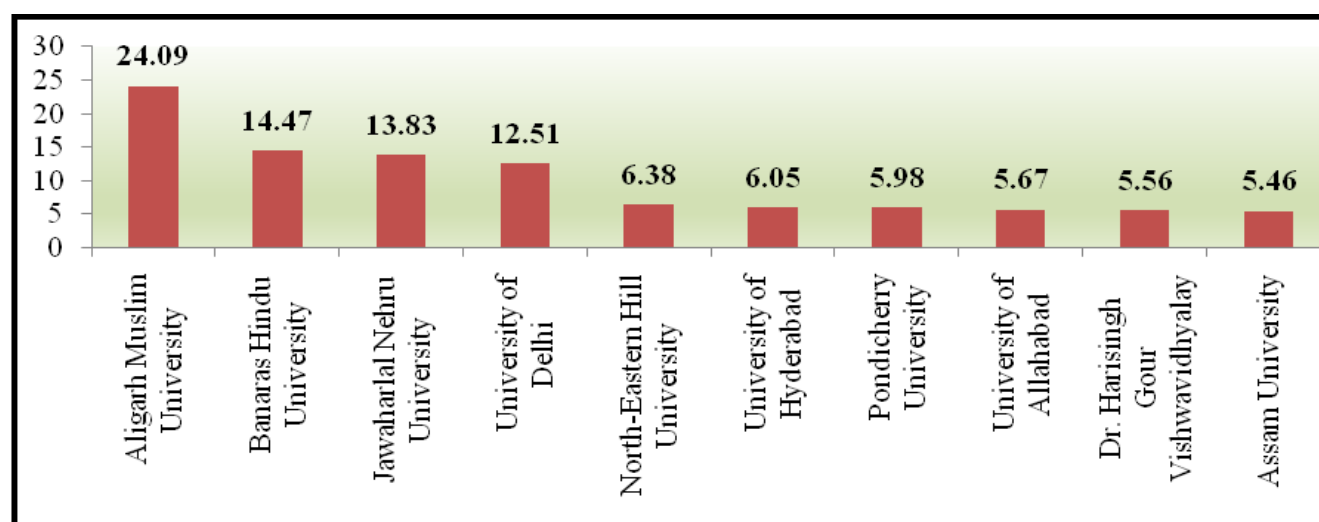
**Figure 1: ETDs of Central Universities**

Table 2 highlights the “Electronic Theses and Dissertation” produced by the various departments of Central Universities and deposited in the Shodhganga by department wise. It is found that the School of International Studies, Jawaharlal Nehru University has deposited the highest number of Electronic Theses and Dissertations (1283, 23.56%),

out of 5446 Electronic Theses and Dissertations of the University. The Department of Chemistry, Aligarh Muslim University has deposited the second highest number of Theses and Dissertations (1006, 10.60%) followed by the department of Hindi, Banaras Hindu University,

Table 2: ETDs by University Departments

S.No.	Department	Total Number			
		University Level	Dept. Level	%	Rank
1	School of International Studies, Jawaharlal Nehru University	5446	1283	23.56	1
2	Dept.of Chemistry, Aligarh Muslim University	9488	1006	10.60	2
3	Dept.of Hindi , Banaras Hindu University	5699	447	7.84	3
4	Dept.of Chemistry, University of Delhi	4929	435	8.83	4
5	Dept.of Chemistry, Dr. HarisinghGourVishwavidhyalay	2192	422	19.25	5
6	School of Chemistry, University of Hyderabad	2385	408	17.11	6
7	Dept. of Bengali ,Assam University	2150	285	13.26	7
8	Dept. of Education, North-Eastern Hill University	2512	264	10.51	8
9	Pondicherry Engineering, College Pondicherry University	2356	251	10.65	9
10	Dept. of Chemistry, University of Allahabad	2235	197	8.81	10
	Total	39392	4998		

, which deposited 447 number of its ETDs, out of 5699ETDs. Further, it is resulted that the Department of Chemistry, University of Delhi has deposited a good number of ETDs in Shodhganga repository. However, it can be seen in the results that Pondicherry Engineering College, Pondicherry University (251, 10.65%) and Dept. of Chemistry, University of Allahabad (197, 8.81%) both have deposited the lowest number of ETDs in the Shodhganga repository.

ETDs in English Language

The language is one of the basic communication tools to send the information to others. The research

information plays an important role for the growth of University. Table 3 shows the total number of Electronic Theses and Dissertations deposited by the top ten Central Universities of India in Shodhganga repository.

It can be found that 98.01% of the Electronic Theses and Dissertations (ETDs) of North-Eastern Hill University produced in English language were deposited in English. Jawaharlal Nehru University has deposited the second highest number of ETDs (92.47%) produced in English. It is followed by University of Hyderabad (91.24%) and Pondicherry University (88.88%) and Aligarh

Table 3: ETDs in English Language

S. No.	Universities	Total			Rank
		Nos.	Nos. in English	%	
1	North-Eastern Hill University	2512	2462	98.01	1
2	Jawaharlal Nehru University	5446	5036	92.47	2
3	University of Hyderabad	2385	2176	91.24	3
4	Pondicherry University	2356	2094	88.88	4
5	Aligarh Muslim University	9488	8145	85.85	5
6	Dr. Harisingh Gour Vishwavidhyalay	2192	1846	84.22	6
7	University of Delhi	4929	4059	82.35	7
8	Assam University	2150	1699	79.02	8
9	University of Allahabad	2235	1515	67.79	9
10	Banaras Hindu University	5699	3734	65.52	10
	Total	39392	32766		

Muslim University (85.85%). Further, it is found that University of Allahabad (67.79%) and Banaras Hindu University (65.52%) were deposited their ETDs produced in English in the Shodhganga repository.

ETDs by Years

The literature is considered as a most important one for research. It provides information about the research work done by other on the particular areas/subjects. It helps the researchers to collect, analysis and share the information with other researchers. The table 4 presents data on the number of theses submitted at ten universities in India over a ten-year period from 2010 to 2019. The table includes the total number of theses, the percentage of total theses, the rank based on the number of theses, and the compound annual growth rate (CAGR) of theses submissions for each university. The calculated Compound Annual Growth Rates (CAGR) for thesis submissions across the ten

universities, we need to apply the CAGR formula. The CAGR formula is given by:

$$CAGR = \left(\frac{V_f}{V_i} \right)^{\frac{1}{n}} - 1$$

Where:

V_f is the Ending value (number of theses in 2019),

V_i is the Beginning value (number of theses in 2010),

n is the number of years (2019 - 2010 = 9 years).

The table 4 provides a detailed analysis of thesis submissions across ten Indian universities from 2010 to 2019, highlighting total theses, percentage contributions, ranks based on 2019 submissions, and compound annual growth rates (CAGR). Aligarh Muslim University leads with 9488 theses, contributing 24.09% of the total, followed by Banaras Hindu University (5699 theses, 14.47%) and Jawaharlal Nehru University (5446 theses,

Table 4: ETDs by Year

S. No.	University	No. of Theses	%	Rank	No. of Theses		
					2010	2019	CAGR
1	University of Delhi	4929	12.51	1	240	533	0.09
2	Assam University	2150	5.46	2	74	197	0.11
3	University of Allahabad	2235	5.67	3	129	246	0.07
4	Banaras Hindu University	5699	14.47	4	9	602	0.60
5	Pondicherry University	2356	5.98	5	9	199	0.41
6	University of Hyderabad	2385	6.05	6	55	198	0.15
7	North-Eastern Hill University	2512	6.38	7	60	132	0.09
8	Jawaharlal Nehru University	5446	13.83	8	262	443	0.06
9	Aligarh Muslim University	9488	24.09	9	295	437	0.04
10	Dr. Harisingh Gour Vishwavidhyalay	2192	5.56	10	15	67	0.18
	Total	39392	100.00		908	2521	0.12

, 13.83%). The University of Delhi also shows significant activity with 4929 theses (12.51%). In terms of growth, Banaras Hindu University exhibits the highest CAGR at 0.60, indicating a rapid increase in thesis submissions over the decade, while Pondicherry University shows substantial growth with a CAGR of 0.41. On the other hand, Aligarh Muslim University and Jawaharlal Nehru University have lower CAGRs of 0.04 and 0.06, respectively, suggesting more stable but slower growth rates. Overall, the total number of theses across these universities increased from 908 in 2010 to 2521 in 2019, reflecting a total CAGR of 0.12. This data underscores a robust enhancement in research output, with significant contributions from key universities, indicating a growing emphasis on academic research and higher education in India.

Annual Growth Rate

The Annual Growth Rate (AGR) measures the year-over-year increase or decrease in the number of theses. It can be calculated using the following formula:

$$AGR = \frac{V_f - V_i}{V_i} \times 100$$

Where:

V_f is the final value (number of theses in the current year),

V_i is the initial value (number of theses in the previous year).

Table presents the number of theses submitted across ten Indian universities from 2020 to 2022, along with their compound annual growth rates (CAGR) over three years and annual growth rates

Table 5: Annual Growth Rate

S. No.	University	No. of Theses			CAGR	AGR
		2020	2021	2022		
1	University of Delhi	411	338	15	-0.81	-21.53
2	Assam University	103	161	104	0.00	-0.55
3	University of Allahabad	221	251	215	-0.01	-0.17
4	Banaras Hindu University	443	675	835	0.37	0.19
5	Pondicherry University	125	189	103	-0.09	-0.83
6	University of Hyderabad	127	173	216	0.30	0.20
7	North-Eastern Hill University	78	132	168	0.47	0.21
8	Jawaharlal Nehru University	301	501	501	0.29	0.00
9	Aligarh Muslim University	441	382	546	0.11	0.30
10	Dr. Harisingh Gour Vishwavidhyalay	38	56	92	0.56	0.39
Total		2288	2858	2795	0.11	-0.02

(AGR). The University of Delhi saw a sharp decline in theses submissions, with a CAGR of -0.67 and an AGR of -21.53%, dropping from 411 in 2020 to just 15 in 2022. Similarly, Pondicherry University experienced a significant drop in submissions, with a CAGR of -0.09 and an AGR of -0.83, reducing from 125 theses in 2020 to 103 in 2022. Assam University and the University of Allahabad also saw declines in thesis submissions, though to a lesser extent, with CAGRs of 0.00 and -0.01, respectively. Conversely, Banaras Hindu University showed robust growth, with submissions increasing from 443 in 2020 to 835 in 2022, reflecting a CAGR of 0.37 and an AGR of 0.19. The University of Hyderabad, North-Eastern Hill University, and Jawaharlal Nehru University also exhibited positive trends. North-Eastern Hill University had the highest CAGR of 0.29 and an AGR of 0.21, with theses increasing from 78 in 2020 to 168 in 2022. Dr. Harisingh Gour Vishwavidyalay demonstrated notable growth as well, with a CAGR of 0.56 and an AGR of 0.39, rising from 38 to 92 theses over the same period. Overall, the total number of theses

across these universities slightly declined from 2288 in 2020 to 2795 in 2022, with an overall CAGR of 0.11 but an AGR of -0.02, indicating a mixed trend with some universities showing significant growth while others experienced declines. This data suggests varying dynamics in research output among these institutions over the three-year period.

FINDINGS AND CONCLUSION

Thesis is one of the most important resources in libraries of higher educational institutions. The research reports are published in a variety of forms such as articles, theses and dissertations and project reports. These resources will help the researchers to collect, process, store and distribute the information to others. The Shodhganga is the repository for the Theses and Dissertations produced by the higher educational institutions. The users can access to the content for the academic purposes and also enables the researchers to find the experts/ researcher in various disciplines. The result shows that the total number of theses across these universities increased from 908 in 2010 to 2521 in 2019, reflecting a total

CAGR of 0.12. This data underscores a robust enhancement in research output, with significant contributions from key universities, indicating a growing emphasis on academic research and higher education in India. Further, it is found that the total number of theses across these universities slightly declined from 2288 in 2020 to 2795 in 2022, with an overall CAGR of 0.11 but an AGR of -0.02, indicating a mixed trend with some universities showing significant growth while others experienced declines. This data suggests varying dynamics in research output among these institutions over the three-year period. Based on the results, the study recommends the following:

- It is recommended that the Statutory bodies like UGC, AICTE, NCERT should provide funds to establish laboratories for innovations and inventions.
- All research guides/supervisors should ensure that the research reports produced under his/her supervision have been uploaded in the project without any deviation and the research guide /supervisors may be permitted to admit more number additional candidates for the research in the disciplines. It will help to produce more research.
- Universities should be encouraged to establish Research Support Centre(RSC) to interact with experts, researchers and authors. It will be useful to produce more of research content in the disciplines collaborately.
- The Universities, which contributed more number of ETDs in the Shodhganga repository
- shall be given priority for the research projects that carried out by the faculty members.

REFERENCES

1. Sivakumaren, K. S. (2015). Electronic thesis and dissertations (ETDs) by Indian universities in Shodhganga project: a study. *Journal of advances in library and information science*, 4(1), 62-66. Retrieved from <https://jalis.in/pdf/4-1/Sivamit.pdf>.
2. ShaliniUrs, R. (1999). TD Initiatives in India-proposed Mysore University ETD Project. *International project of electronic dissemination of thesis and dissertations*, UNESCO. Retrieved from <http://www.unesco.org/webworld/etd/contributions.html>.
3. Vijayakumar, J.K., Murthy, T. A. V., & Khan, M. T. M. (2004). Accessing Indian university research literature: importance of ETDs in the verge of UGC-InfoNet. *In Proceedings of SIS2004 Conference held at IIT, Chennai*.
4. Sivakumaren, K. S., &Thangavel, R. (2021). Analysis of Electronic Theses and Dissertations (ETDs) on Library and Information Science in OATD. org: A Study. *Library Philosophy and Practice*, 1-10. Retrieved from <https://digitalcommons.unl.edu/libphilprac/6182/>.
5. Wani, J. A. (2019). Open Access Electronic Thesis and Dissertation Repositories: An Assessment. *Library Philosophy and Practice*, 1-11. Retrieved from <https://digitalcommons.unl.edu/libphilprac/2528/>.
6. Jeyapragash, B., Rajkumar, T., & Muthuraj, A. (2016). Research output analysis of electronic theses and dissertations with special reference to Shodhganga. *Science & Technology*, 3(1/2), 16-20. Retrieved from <https://www.jctl.org/index.php/jctl/article/view/30>.
7. Ezema, I.J. and Ugwu, C.I. (2013). Electronic theses and dissertations in Nigeria university libraries: Status, challenges and strategies. *The Electronic Library*, 31(4), 493-507. Retrieved from <https://doi.org/10.1108/EL-08-2011-0118>.
8. Ramdas Lihitkar, S. and Lihitkar, R.S. (2014). Electronic theses and dissertations (ETDs) in India: a comparative study. *Library Hi Tech News*, 31(2), 9-14. Retrieved from <https://doi.org/10.1108/LHTN-10-2013-0061>.
9. Khaparde, D., &Ambedkar, B. (2014).Growth and Development of Electronic Theses and Dissertation (ETDs) in India. *Journal of Library and Information Sciences*, 2(1), 99-116. Retrieved from <https://jlis.thebrpi.org/vol-2-no-1-march-2014-abstract-10-jlis>.
10. Sheeja, N. K., & Cherukodan, S. (2011). The development and promotion of ETDs in Kerala. 8th International CALIBER - 2011, Goa University, Goa. Retrieved from https://scholar.google.co.in/scholar?start=20&q=ETDs+in+india&hl=en&as_sdt=0,5.
11. Ahmed, A., Alreyaee, S. and Rahman, A. (2014). Theses and dissertations in institutional repositories: an Asian perspective. *New Library World*, 115(9/10), 438-451. Retrieved from <https://doi.org/10.1108/NLW-04-2014-0035>.