Indian Research: Policies and Practices to Enhance the Quality of Research through Indian Open ETD Repository

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Abstract. New education policy (NEP2020) is getting implemented in India to revamp and reform the higher education sector with changes in policies and practices with access, equity, quality, affordability & accountability which is also giving focus on Indian research. The University Grant Commission (UGC), an apex body of Govt. of India which is entrusted with responsibility of regulation, monitor and policy making for higher education institutions (HEIs). Research works in Indian Universities are made available in open ETD repository called Shodhganga for world wide access as per the policy and practices followed in country. The open access to the research repository is a boon to the Indian scholars for enhancing the quality of research. This paper finds the work flow, growth, and major thirst area raised on the analysis of Indian repository which is hosting 3,50,000 theses from 530+ contributing Universities. This paper discusses polices and practice based on important regulations/notifications which has lead India in improving the quality and quantity of research in terms of scholarly publications as well as awarding of PhD degrees. Growth of the India ETD repository along with tools provided under Govt schemes (ShodhShuddhi) to academic Institutions for quality monitoring is also discussed.

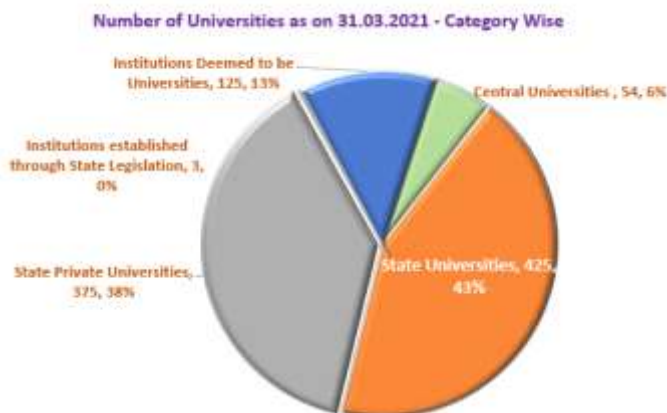* Scientist-E(CS), INFLIBNET Centre/UGC, Gujarat/India
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1 Introduction

At the time of Independence of India in 1947, there were only 20 Universities and 500 Colleges in the country with 2.1 lakhs students enrolled in higher education institutions (AR FY 2010-2011). Now, higher education system in India is comprising of 1061 Universities/Institutions including Institutions of National Importance and 45562 Colleges (AR FY 2020-2021) with an enrolment of 394.34 lakhs students in graduate programmes to doctoral programmes. Indian ETD Repository, Shodhganga, is created based on UGC Notification on Minimum Standards and Procedure for award of M.Phil./Ph.D. Degree), Regulations 2009. About 800+ Universities are providing doctoral programmes and 680 Universities/Institutions (HEIs) have signed MoU for uploading electronic copy of theses into the national repository, Shodhganga. The notification is the first attempt to provide comprehensive national policy on Doctoral programmes followed by many guidelines and notifications issued to enhance quality of research.

The number of universities category-wise as on 31.03.2021 is given below.

Chart 1. Category-wise Universities in India

India is aiming to create Research-Intensive Universities in the New Education Policy (NEP-2020) to increase Gross Enrolment Ratio (GER) to 50% in higher education from current GER of 27.10% (2019-20). The NEP 2020 proposed to establish a National Research Foundation in order to fund, coordinate, and promote research in the country.
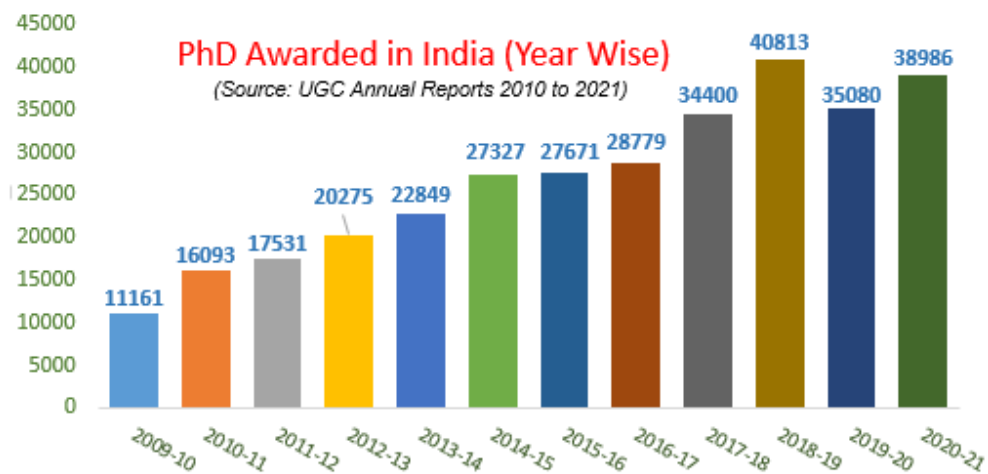
2 Growth of ETD Repository in India

In the country, only 2.7% Colleges run Ph.D. programme The number of Ph. Ds awarded in the year 2009-2010 was 11161 and it is increased almost by 350% in last 10 years where 38986 theses were awarded in 2019. The enrolment in HEI has increased 45% in last 10 years. Though, NEP has recommended to withdraw the M.Phil programme, 18220 M.Phil are awarded in 2019 with an enrolment of 24031 students for M.Phil course in 2019-20. The enrolment of students in Ph.D programme in the same year is increased to 2,24, 469. All India Survey of Higher Education Institutions (AISHE) collects data from HEIs including research data since 2013-2014. The National Institutional Ranking Framework (NIRF) by the MoE in September 2015 outlines a methodology to rank institutions across the country. The data is collected based on various parameters like Research and Professional Practices,

Teaching Learning & Resources, Graduation Outcome, Outreach & Inclusivity, Perception etc where Institutions fill data for raking purpose through a portal. Considering all the data available from AISHE, NIRF and theses uploaded in Shodhganga, it is found out that about 40,000 theses are getting awarded in every year (Table-1).

From the UGC Annual Reports of FY 2010 to 2021. It is seen that the awarded PhDs in Indian Universities has grown from 11161 in 2009-10 to 38986 in 2021. There are few institutions like Institutions of National Importance (INI), like Year-wise PhD awarded theses from the Annual Reports are given the Chart 2.

Chart 2. No. of PhD Theses Awarded in India from 2009-2021

Number of PhDs awarded should match with the softcopies of theses uploaded in Shodhganga, if policies are rightly followed by the Universities. Universities which are striving towards quality and ranking strictly follow the guidelines and parameters set for Ranking in NIRF and also fill the data properly by the participating universities. Indian Government has made it voluntarily to fill data in AISHE in order to get the updated data in higher education. Since all are different purposes, the data available in these portals varies for Phd Data. The awarded PhD data is taken from AISHE, NIRF, Shodhganga (Uploaded) in last 5 years is given for a comparison.

Table-1: Ph.D data from various sources

Year	PhD Awarded as per AISHE Data	Uploaded Theses in Shodhganga (ETD Repository)*	PhD Awarded as per NIRF from participating Universities
2014-15	21830	19792	28844
2015-16	N/A	37437	28676

2016-17	28779	63135	32285
2017-18	34400	51,865	36501
2018-19	40813	35222	38937
2019-20	38986	46778	40256

Previous years theses also uploaded

Initial acceptability for the policy was reflected in submission of theses in formative years as only 1171 theses were submitted in 2010, followed by 1522 in 2011. Gradually more and more theses are getting uploaded in the ETD repository (chart 2) and Universities started following the regulation by adopting it through their policy making bodies. Last one year, 50501 theses (chart 5) are uploaded even during the academic Institutions are closed due to pandemic. UGC also provided incentives till 2012 to digitise backlists of theses. In the year 2016 and 2017, witnessed random leap in uploading the theses (chart 4).

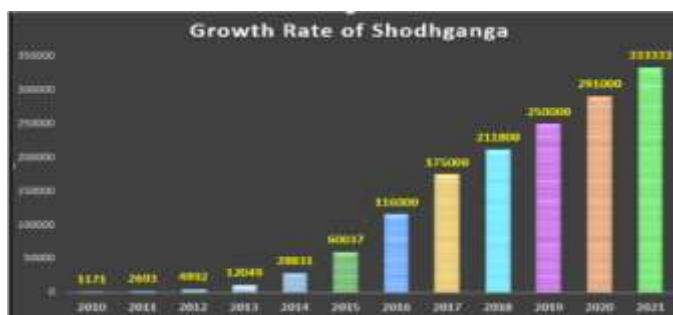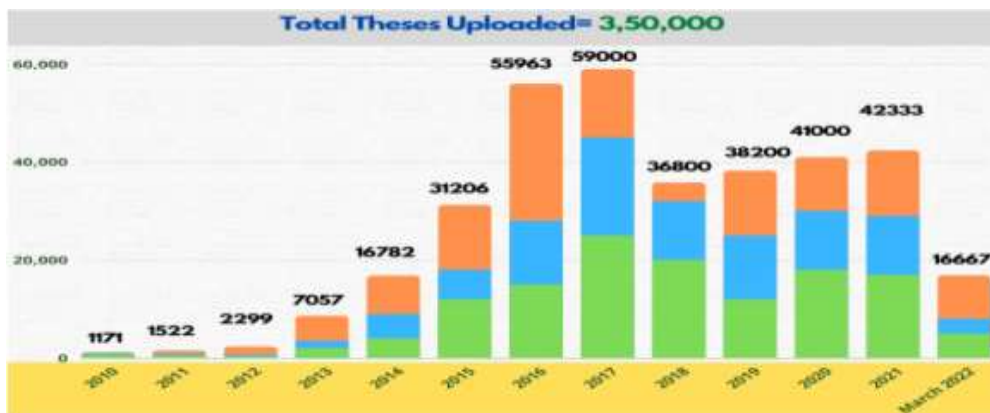**Chart 3.** Year-wise growth of ETD Repository (2010-2021)

Chart 4. No. of Theses submitted in each year into Shodhganga (2010-2022)

There are 28 States and 8 Union Territories in India and many States Universities started digitising under various schemes or by own funds to submit old theses by scanning the physical copies.

State wise distribution is shown below:

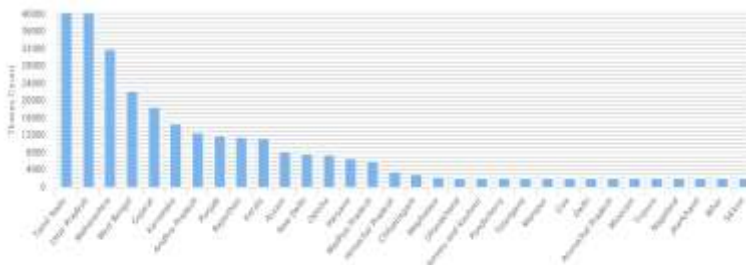**Chart 5.** State-wise contribution into Shodhganga

Chart 6. Pandemic time contribution of theses into Shodhganga

3 Analysis of Shodhganga ETD Repository

Out of 3 Lakh PhD Theses, which were uploaded in first 10 years (till April 2021) of the existence of ETD repository, Chemistry subject Theses are highly getting uploaded into Shodhganga portal which shows that highest research were conducted in Chemistry discipline followed by Engineering, Education, Physics etc. and the lowest number of Theses uploaded in the subject of Psychology and Geography were research need to be strengthened.

Chart 8. Subject wise Theses in Shodhganga   **Chart 9.** Subject wise Theses in Shodhganga

About 10.6% (i,e 31744) overall Thesis submitted from 16 regional languages with Hindi (11374, 33%) in top followed by Sanskrit (6212, 19%) and Tamil (4231, 13%). The other regional languages such as Bengali, Marathi, Oriya, Gujarati, Kannada, Telugu, Urdu, Punjabi, Pal , Malayalam , Assamese and Manipuri have presence in Indian ETD repository. Foreign languages like Arabic (480), French (61), German (21)and Japanese (2) theses are also uploaded by the Indian Universities.

Chart 7. Regional Language Theses in Shodhganga

4 ShodhShuddhi (PDS) for Purification of Research

One of the 100 days agenda of Ministry of HRD, Govt. of India is to provide Plagiarism Detection Software to all Indian Universities/Institutions which include Central Universities, State Universities, Deemed to be Universities, Private Universities, Centrally Funded Technical Institutions (CFTIs), and Institute of national importance (INIs), Inter University Centre of UGC (IUCs). INFLIBNET Centre is the nodal agency to execute this initiative under the guidance of MHRD. ShodhShuddhi is an initiative to enhance the quality of

research among academic community in higher education institutions in the country by facilitating easy detection of plagiarised content in the academic and research works which include articles in journals and conference proceedings, chapters in books, theses, research reports, assignments, project works, lecture notes, e-text/e-content for MOOCs and LMS, etc. that are supposed to be original. The anti-plagiarism software/tool selected (Ouriginal- formerly URKUND) will facilitate to compare submitted documents with database of documents maintained by the developer of plagiarism detection software consisting of subscription-based resources, current and archived Internet web pages and web documents, open access resources from primary publishers and aggregators, student papers database, etc. The "document database" may also include newspapers, magazines, electronic books, periodical databases covering popular magazines, MOOCs content, business and professional contents, subject-specific and handbooks and general encyclopaedia, etc. The faculty members and research scholars can check the plagiarised contents from the primary and alternate source and get the similarity report.

4.1 Status of ShodhShuddhi

1060+ Universities /Institutions are provided access to check similarity under the project and 1,27,700+ research scholars and faculty members from 817 Universities/Institutions are actively using the PDS by about.
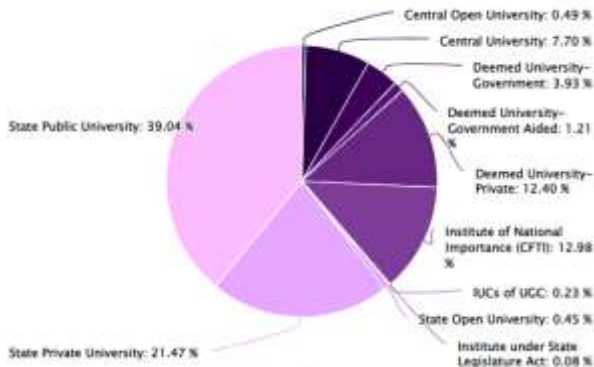
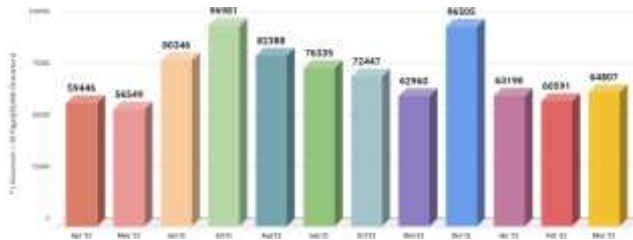**Chart 10.** Category-wise Usage of ShodhShuddhi

Chart 11. Year-wise Documents Submission for Similarity Check in ShodhShuddhi/PDS

Chart 12. Monthly Submission of Documents for Similarity Check in ShodhShuddhi (2021-22)

4.2 Advantages of ShodhShuddhi

- Provided based on the UGC notification on Academic Integrity, 2018

- Improve the quality of research articles by reducing the plagiarised contents

- Act as monitoring tool to the Guides for their Research Scholar

- Curb plagiarism among academic community

- Supervisors/Guide/Teachers can monitor their research scholars and students for their academic publications while writing

- Provide awareness about ethics to be followed while doing research

5. Conclusion

Getting the right data about details of PhD submitted from single source is still not easily available in India. There are UGC annual reports, AISHE, NIRF etc to compile to reach to a normalised number of submission in an year. About 40000 theses are now getting submitted and getting all theses to a single national repository was not an easy task. Relevant policies and guidelines with proper mandate to HEIs can make some changes. Since, India is a huge nation with diversity in it's culture, Policy changes in any level takes slow pace in the initial phase. There were slight resistant in the formative years when started ETD Repository. As it is seen in the growth chart, in first year (2010) only 1171 theses are uploaded, but in the last year (2021-22) about 50,000 theses are uploaded. The repository has grown into 3,50,000 as

on 31.03.2022. About 2 Million documents are checked for plagiarism from Sep'2019 onwards. Nation is expecting high quality research papers and Ph.D theses in the coming years.

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