National Level ETD Efforts: A Comparative Analysis

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Abstract

Purpose: The purpose of this paper is to explore cooperative ETD efforts in USA, U.K, India and China that have larger education systems and larger number of higher education graduates. Also to analysis ETD movement of India in comparison.

Design/ Methodology/Approach: This paper starts with introduction of cooperative ETD movement in countries in four countries, namely USA, U.K, India, China then proceed with an effort to discuss comparative analysis of findings.

Findings: ETD movement has been adopted by various countries around the world. This study found that there is a requirement of national level ETD service in each country for the swift growth of ETDs around the world. The authors found that universities level ETD programs are the key factors to promote national level ETD service.

Research Implications : This paper gives the recommendation for further analysis to explore the solutions to excel cooperative ETD movement in various countries around the world.

Originality / Value: ETD development in various countries has been explored by various studies but comparative analysis of cooperative ETD service of various nations have not been done. It will be an effort to explore national electronic thesis service of USA, U.K, India and China.

Keywords: ETD, National Thesis Service, Shodhganga, CALIS-ETD, EThOS, Co-operative ETDs,
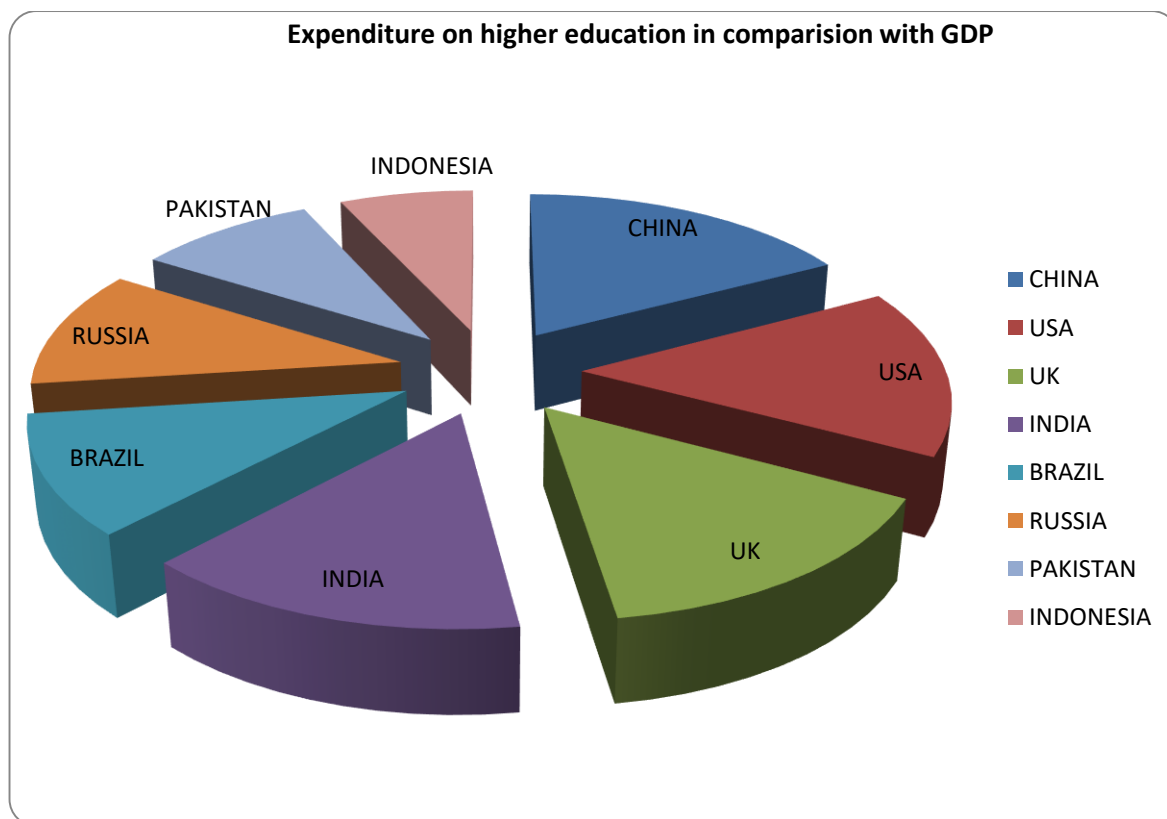
1. Introduction

Higher education infrastructure and policies of a country represents a vital parameter to measure growth rate and capabilities to face challenges. Now market for higher education is global and universities and higher learning institutions are operating cross countries.. Standards and outputs are measure at international level based on various parameters. The outputs in terms of theses and dissertation are considered as an success indicator for academic/ research community of the country. Large number of institutions have system to keep ETDs on their websites and institutional repositories. There are arrangements for collaborative repositories to the extent to the national and international level. Various studies have been undertaken to signify the role and challenges of the ETDs in different countries (Gould, 2016), (Cayabyab, 2015), (Panda, 2016), (Zeng &Sun, 2014), (Zhao & Jiang, 2004).

The present paper describes four national level ETD repositories exist in the China, USA, UK and India. These countries comprise large part of the student population. According to British Council report, represented at Global Conference in Miami (2014), " Nine countries around the world covers 2/3rd global student population. These countries are Brazil, China, India, Indonesia, Nigeria, Pakistan, Russia, U.K and USA".

Tertiary education defines as the higher education after completion of secondary education. It can be a catalyst for stronger society and solution for critical problems. According to orld Bank Open Data (http://data.worldbank.org) and "British Council report 2015- Managing large systems, A Comparative analysis : Challenges and opportunities for large higher education systems", the governments of four

countries China, USA, UK and India are leading to allocate expenditure on tertiary education in comparison with GDP shows by chart:1.

It can be clearly shown in table:1 that China, USA, UK and India are four leading countries being government expenditure on tertiary education in comparison with GDP, resulting in larger in numbers of graduates from tertiary education, both sexes.

Source : https://www.britishcouncil.org/sites/default/files/3.6_managing-large-systems.pdf

Chart : 1

Data Set : Education
Indicator : Graduates from tertiary education, both sexes

Sl.No	Countries	No. of Graduates from Tertiary Education
1	CHINA	9366202
2	INDIA	8846030
3	USA	3784640
4	UK	791945

*Source : UNESCO INSTITUTE OF STATISTICS (Date : 05 Sept 2016 URL:http://www.uis.unesco.org)

Table : 1

Higher education system in selected four countries have different setup and approaches in regard to repository provisions of ETDs. As Ph.D programmes are the best pillars for systematic education quality for graduate education system. Thesis and dissertations are the research outputs and reports of the graduate and Ph.D scholars. Advancement of ICT has presented latest tools and techniques to support researchers. As the name described " Electronic Thesis and Dissertations" are the electronic forms of thesis and dissertation. The idea of ETD was first started in Virginia Tech polytechnic in 1987 (Sengupta, 2015). The efforts were supported by various sources with in a period of ten years. As a result, Networked Digital library of thesis and dissertation (-NDLTD) has been framed (Fox, 2013).

NDLTD is a non-profitable U.S based organization with aim to promote ETD education, development, dissemination of information, creation of standards and extended cooperation between ETD groups.
Most detailed understanding of ETD terms may be in word of Virginia tech polytechnic,
"A thesis is a work generated in support of candidature for a doctorate or master's degree respectively which presents the author's research and findings. Electronic versions of thesis and dissertations are called ETD" (Sengupta, 2015).

In the age of open access of research data, ETDs plays key role for sharing of resources. ETDs do have advocacy for open access which enhance visibility of research work. Due to fast searching facilities it may be easily explored by the researchers to get fruitful results.

2. Cooperative ETDs

China, USA, UK and India have large number of universities. These countries have primary goal to provide higher education to a larger mass of students. As, ETDs have been recognized as a best supportive tool for researchers. There is immediate requirement of cooperative ETD repository at national level.

The success of a National ETD repository rests on regular contribution by their members. So it is necessary to study the existing ETD facilities and services in the countries under study.

3. National cooperative ETD efforts:

3.1 China ETD Program:

China Academic library and information system (CALIS) has been founded in 9th five year program of china. Under national administrative centre, Ministry of Education of china in 1996. The synthesis of CALIS has been done to build a strong academic library system in china. CALIS head quarter of National Administrative Centre has been situated in peeking university. This project has been implemented in various phases. National effort for Cooperative ETD named as CALIS-ETD has been launched in 1999. It has been completed three phases and forth phase is running. CALIS has established "Electronic Thesis and Dissertation Digital Library (CALIS-ETD-DL)". The framework of this library has been planned in distributed digital setup. CALIS-ETD project has more than 100 member libraries. Around 1.72 million Chinese ETD are recorded. It has been launched for the ETD resource sharing among universities in china. CALIS-ETD-DL project has been planned to cater ETD resources sharing among 1000 or more Chinese universities. CALIS-ETD platform is an integrated system of available sources for Thesis and Dissertation in china. Electronic Thesis and Dissertations from member libraries, NDLTD, PQDT have been pooled under one system.

Figure : 1

3.2   USA ETD Program:

3.2.1   Virginia Tech in USA is a well known educational body for Virginia polytechnic institute and State University. Initiation of ETD concept has been credited to Virginia Tech University since 1980. The mandate for online submission of thesis and dissertations started from 1997. Virginia tech ETDs primary goal is to provide open access to Thesis and Dissertation database.

Figure : 2

3.2.2 The USETDA has been started in 2009 by ETD active professionals in United States. The United States Electronic Thesis and Dissertation is a non-profit association in higher education with in the United Nation. It has been constituted to fulfil the goals of development of state vide ETD initiatives, to organize information on best practice, to provide best available education & training to ETD professionals within U.S and provide co-operation to international ETD organization.

Figure : 3

3.3 U.K. ETD Program :

UKTG : UK Thesis Online Group was the first initiation of ETDs in U.K. It was established in 1990. The theme of establishment was to connect various peoples related to Thesis and Dissertations. UKTG have done various efforts to enhance ETDs usability in UK universities. In this series a big survey has been conducted with the help of British Library and Joint Information Systems Committee (JISC).

Universities in UK generally send duplicate copy of thesis to British Library. While there is not any regulation in existence for the purpose. British library EThOS electronic thesis service has been started in 2009.

UK institutions awarded thesis has been covered by EThOS upto 87%.

Figure : 4

3.4 Indian ETD Program:

National knowledge commission of India has been setup in 2005 by the planning commission of India. Its aim to preserve knowledge in best possible ways and maximize sharing of resources. National Knowledge Network has been planned to maintain various aspects of national digital contents. ETD has been recommended one of the best ways to preserve and disseminate national research output.

Informational and library network which is an inter university centre of university grant commission of Government of India known as INFLIBNET Centre. On the recommendation of National Knowledge Commission and funding of Ministry of Human Resource and Development a national ETD repository project SHODHGANGA has been planned in 2009 and started in 2010 by INFLIBNET.

Figure : 5

In year 2009 University Grant Commission passed a regulation called eligibility criteria for the award of MPhil and PhD degrees. It is mandatory for the research scholar to submit the electronic version of MPhil/PhD dissertation.

Shodhganga is a national level open access ETD repository of Indian Electronic Thesis and Dissertation. It has been designed on open source software DSpace, a digital repository software.

China, U.K and India have National Thesis service based on cooperative ETD model. United States of America has various good ETD repositories; these are growing at leading stage internationally. But USA doesn't have National thesis service.

So National ETD repository service in China, U.K and India will be considered for comparison.

Sl.No	Parameters	U.K	CHINA	INDIA
1	Name of National ETD Service	ETHOS	Calis –etd	Shodhganga
2	Year of start	1990	1999	2009
3	Regulatory authority	UK Thesis Online Group	China Academic library and information system	INFLIBNET Centre/UGC
4	Funding agency	British Library and Joint Information Systems Committee	National Administrative Centre, Ministry of Education of China	Ministry of Human Resource and Development, Govt of India
5	Universities contributed / Total Number of Universities	Around 111/135	Around 100/1000	Around 261/759
6	Access	Free	Free	Free
7	Resources covered	Thesis, Dissertation, Articles	Thesis, Dissertation, Articles, Digital resources	Thesis and Dissertation
8	Full Text Thesis Statics	170000	1720000	99995
9	Search options Available	Basic and Advanced	Basic, Title, Author, keyword, summery, Tutor	Basic, Advance, Universities, Departments, Subject, Date Submitted, Researcher & Guide, Title, Keyword, Google search
10	RDM facility	Not Available	Planned in Phase IV	Not Available

11	Meta data used	Open Archives Initiative Protocol for Metadata harvesting	Open Archives Initiative Protocol for Metadata harvesting	Open Archives Initiative Protocol for Metadata harvesting
12	Implementation	Distributed	Decentralize	Centralized
13	Mandatory deposit act	No Act in Existence	No Act in Existence	University Grant Commission Act
14	Search Engine Used	Web based	E-du Search Engine	DSpace Enable
15	User Management	Free User Service	Unified Authentication system part of CALIS cloud service	Free User Service
16	Full Text Access	Login Based	ILL Based	Free world wide
17	Portal Interface	World Wide Web	CALIS-ETD Central System	Semantic Web based Application

Table : 2

4. Analysis and Finding

National cooperative ETD services of three countries are the best effort of cooperative ETD movements among the largest mass of higher education students. The growth and development of these ETD repositories are analysed at various parameters as under :

4.1 Growth Rate

Cooperative ETD movement at national level have been started in 1990 by EThOS, British National thesis service in U.K. After nine years in 1999, CALIS-ETD has been started in China as national thesis service and after ten years in 2009, Indian national thesis service has been started as Shodhganga. Presently EThOS, British thesis service completed around 25 years and 87% of Ph.D awarding institutions are its regular contributors. Still 13% Institutions are in process to cover under national thesis service.
While China national thesis service CALIS-ETD has been completed more than 15 years but around 100 institutions / Universities are covered under national thesis service. While, china have more than 1000 universities/ institutions for higher education.
CALIS-ETD has to cover a long way to achieve 100 % submission of Ph.D thesis in national thesis repository.

Indian national ETD program has completed just around 7 years. But shodhganga national ETD repository has achieved significant growth year by year. University Grant Commission has recorded 759 universities while 261 universities have their thesis contribution in shodhganga national ETD repository.
Indian national ETD service has been covered 30% of universities contribution in last five years. It is good growth rate but Indian ETD movement may discover better mile stone if ETD movement will be implemented at state level also with national supported infrastructure.

4.2 Mandatory Deposit regulation

Life of a ETD repository solely depend on contribution of records and cooperative national ETD may grow by contribution of members.
British thesis service EThOS and china thesis service CALIS-ETD don't have any regulation for universities to contribute mandatory in national thesis service.
Indian national thesis service shodhganga has been framed by UGC regulation of universities for mandatory contribution.

4.3 Implementation and Access

EThOS, CALIS-ETD and Shodhganga national cooperative thesis service repository are free to access. All these repositories have various search facilities for readers while full text access is controlled in CALIS-ETD repository. EThOS and Shodhganga provides free of cost direct full text access.

All three ETD repositories have OAI-PMH enable metadata service. Implementation of EThOS and CALIS-ETD are decentralized but shodhganga has centralized system for national ETD repository.

Shodhganga ETD search has discovered results only from Indian thesis and dissertations while EThOS and CALIS-ETD have integrated database with other ETD collections.

4.4 NDLTD Support

Around the world National Digital Library Thesis and Dissertation known as non-profitable organization dedicated to ETD development and research projects. NDLTD provides the support for ETD establishment projects at national and states level in various countries.

India and USA are two leading countries have measure share in NDLTD members. While, U.K and China have least participation. The significant growth of shodhganga ETD projects has remarkable contribution of NDLTD support at state and institution level. More than 50 universities and institutions in India have their ETD institutional repository with membership of NDLTD.

4.5 Areas for Future Concern

Electronic thesis and dissertation is a rising concept in universities around the world, yet various universities don't have infrastructure for Information and communication technology. Comparative analysis of EThoS, CALIS-ETD and Shodhganga extract that remarkable achievement of ETD concept may discover by implementing it at various levels as under:

- National level ETD repository should be framed
- Submission of Electronic Thesis and Dissertation should be mandatory to award Ph.D. degree.
- National level ETD development training programs should be available.
- Information and communication technology enable campus should be mandatory requirement for accreditation of Universities.
- State vide ETD development programs should be started.

5. Conclusion

National cooperative ETD efforts study has presented an efficient picture of cooperative ETD movements around the world. Advancement of Informational and communication technology has provided various efficient tools to manage research. Due to changing paradigm of research to e-research a data intensive research approach has been in practice.

ETD movement around the world is required to setup an international standard and guidelines to manage research contents and data. As volume of data in research is increasing and important, it is very much required to develop a well-planned ETD framework with research data management capabilities.

The challenge to the national cooperative ETD service is to cover complete thesis and dissertation work of their respective country. Further requirement of research is to discover hurdles on ground realities in process to develop ETD services in these countries. Research data management enabled ETD programs of a country may provide a unique portal for research developments.

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