

## **The Perceived Ease in Adoption of Electronic Thesis and Dissertation (ETD)**

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### **Abstract**

Thesis and dissertations are a unique and rich source of information and it is often the only classic research that always do not channel into publications. They are often an underutilized research asset leading to unnecessary repetition and duplication. Misuse and plagiarism of research work can be identified by maintaining robust ETD. On the perspective of academic pathway, registry and research assortment there are scores of issues, however using ETD to the best is an important strategy to empower knowledge. This article accentuates the usage pattern of ETD and its prospects. A survey was conducted to identify the ease in the adoption of ETD. The felt benefits and opportunities for improvements were identified. It was evident that many researchers have access to ETD. However, the prominent use of ETD was by the PhD research fellows to upload thesis and information search was done at a later stage. Increased efficiency was noted in uploading electronic thesis into the ETD system and it was cost saving. On the flip side to locate the thesis upload site was an intricate process. Information on service strategy that enabled expansion of electronic thesis was reconciled. There was a prominent need for detailed governing procedure to process the electronic thesis submission. To fully utilize the potential of ETD sufficient infra-structure and IT training must be provided for researchers, towards implementing an automated process. Clearly there is a need for administrative procedure to recognise an easy to use procedural pathway. Materialization of mandatory electronic thesis submission will gain useful insight on matters of electronic thesis development.

**Keywords:** ETD, electronic thesis, dissertation, University repository, electronic submission

### **1. Introduction**

Electronic thesis and dissertations (ETD) are a new-fangled mode of scholarly research communication. Thesis and dissertations are the primary source of information that are essential to deeply understand the extent of research but many languish in obscurity as archives in University libraries (Schopf et al., 2014). In general, thesis produced from PhD candidates are often collected and stacked on library desks that impede open access. Similarly, many analogous documents are not digitalized due to lack of funds, infrastructure,

skilled staff and relentless electric failure. The ETD program provides a process, standards and software to automate functions, as well as a digital frame for access and preservation (Lippincott, 2006; Swain, 2010). The repository has the capacity to capture, store, index, preserve and disseminates ETD produced by the research scholars. These are automated services in universities to implement ETD for the best of its utility (Schopf et al., 2014; Seeman, Millard, & Santucci, 2016).

The ETD program initially originated in the US in 1987 at a focused workshop on Standard Generalized Mark-up Language (SGML) application, followed by SGML Document Type Definition (DTD) for ETD was developed (Crowe 1998, Yiotis 2008). In early 1990's Adobe's Portable Document Format (PDF) for ETD evolved and this format was widely used for ETD. Around the world, there is a substantial upsurge in the use of ETD (Suleman et al., 2001). Several University libraries are introducing electronic thesis (e-thesis) (Greig, 2005). In Middle East countries, though there are adequate infrastructures for ETD programs, there are legal, administrative and technological encumbrances. In the West, libraries have adapted ETD models that are tailored for institutions (Moeti, 2005).

In India, Shodhganga Digital library technologies facilitated ETD to gain momentum (Becker, 2008) under UGC Notification (Minimum Standards & Procedure for Award of M.Phil. / Ph.D Degree, Regulation, 2009) on 1<sup>st</sup> June 2009 which directs mandatory submission of electronic version of doctoral theses from for the University research (Schopf et al., 2014). Shodhganga ETD is sustainable and interoperable with other essential features with the widely adopted Dspace system (Dhanavandan & Tamizhchelvan, 2013). This open source repository software was developed at Massachusetts Institute of Technology (MIT). Dspace is used worldwide including US, UK, Russia, Canada, Philippines, Japan and 15 African nations (Copeland, Penman, & Milne, 2005; Lynch & Lippincott, 2005). To facilitate open access of Indian thesis and dissertations in coherence with the world wide academic community, the major impetus in development of Indian electronic thesis has come from Shodhganga. Shodhganga is the reservoir of stored Indian intellect in the repository hosted and maintained by INFLIBNET Centre (Shodhganga, 2015). The Shodhganga@INFLIBNET Centre offers a platform for research scholars to store their PhD thesis and make it available in open access for the entire scholarly community (Murthy, Cholin, & Vijayakumar, 2005). The development of Networked digital library of theses and dissertations (NDLTD) was a collaborative move of universities to foster accessible ETD to enable creative distribution of achieves (Edminster & Moxley, 2002; Middleton, Dean, & Gilbertson, 2015).

The library movements in India are entering an accelerating phase. Mandatory submission of ETD by all Indian Universities was enforced by the Action Plan of the National Task Force (Charleston & King, 1991). This policy has given the framework to develop the digital library of ETD. INFLIBNET had done the initial work and hosted an exclusive data for PhD thesis submitted for Indian universities (Murthy et al., 2005). Currently in India, PhD thesis are encouraged to be produced electronically, however minimal efforts are made in disseminating the merited scope of ETD and its repository. Central polices adjoined with University and institutional repository is also lacking (Allen, 2005; Lynch & Lippincott, 2005; Narayana, 2016). The strategic aim of ETD is to provide access to electronic thesis that are relevant in number of areas, particularly to improve effective scholarly communication and encourage extensive participation (Becker, 2008; Middleton et al., 2015). Perhaps it would promote widespread participation of new generation research students interested in generating non-traditional and nonlinear thesis (Hirwade, 2011) for a sustainable world class dynamic research sector.

This original research paper attempts to ascertain the ease of adoption of ETD and estimate the level of its usage at a University located in Tamil Nadu, India. This article explores the ETD user's perspective on the implications of ETD initiation and adoption. This article will also provide concrete information on the applicability of ETD as experienced by the researchers in processing their ETD upload and inform strategic opportunities for improved strategies to overcome the challenges in electronic thesis adoption. To inform appropriate strategies for ETD implementation, a glimpse of the governing process of ETD, applicability and potential benefits of ETD initiative on the perspectives of the user was investigated. The facets of academic and digital repository are discussed. The learning from this article can be extrapolated to other Universities in the same region.

## **2. Why Electronic Thesis and Dissertations (ETD) repository?**

Prior to ETDs, theses frequently would sit on the shelves gathering dust, constraining the cataloguing leading to possible compromised quality of repository (Bevan, 2005; Copeland et al., 2005; Lynch & Lippincott, 2005). Such resources are invisible treasures obscured from the active research community. Producing ETD will streamline, rationalize and simplify administration of thesis submission process in the University registry (Schopfel et al., 2014). In general, there are several reasons why universities aspire to develop and offer access to

provide electronic theses collections (Middleton et al., 2015). The e-journal library policy is to offer access to electronic journals and books, thus expansion of electronic resources are at a premium in most libraries (Seeman et al., 2016).

The main purpose for adopting electronic thesis at the University is to provide huge untapped resources of information available for a wide range of scholars. Arguably this may not be the same situation for some institutions as the main drive. In some cases, when some of the research work may not be published in a peer reviewed journals, the digital form of the theses itself would be important for claiming credit for the work. Similar circumstances are commonly seen in disciplines such as Engineering, Arts and Science that embed computer models and programs (Dhanavandan&Tamizhchelvan, 2013). Another main reason of ETD was to benefit the students who need to understand the evolving world of electronic publications, intellectual property, copy right and many more (Brenenson et al., 2016). In a way it was to encourage and acknowledge students to develop new thoughtful ways to create opportunities for their research contribution.

### **3. At The University Level**

Several University libraries are fervent on electronic thesis and it is the University administrators and thesis supervisor's responsibility to encourage ETD. It is essential to amend the University regulation in order to entrain research scholars to deposit the electronic version of their thesis, which might be an irksome and time consuming process (Middleton et al., 2015). If research is more easily available and more quickly and widely accessible it will have an optimistic effect on the dynamism of research environment. This will enable easy identification of original research on web that is easy to locate.

The University as an educational and research institute considers adoption of ETD and its access of central importance. Majority of doctoral candidates progress and develop to create innovative research. The University is a member of electronic thesis consortium of Shodhganga since 2015. The University adopted Shodhganga ETD repository as a first step to populate the University's institutional repository. After the adoption of Shodhganga ETD for over a year currently the University contains 57 uploaded electronic theses. Through this project, the University is keen to move electronic thesis submission at the institutional and departmental level. It was the felt that by getting involved with collaborative national projects and simultaneously tailoring it to the local would benefit each other. Currently, with the

changes in the Ph.D. submission regulations, the University receives all of its thesis and dissertations electronically. As a collaborative member of Shodhganga ETD initiative project, the University is in the process of scanning archived projects and thesis. In an academic year, the University produces on an average 35 doctoral theses. Followed by it is working on to test the upload of thesis metadata to implement the same for departmental repository and evaluate the assignments and its full text through a plagiarism detection software. The University has taken the lead in ETD adhered with the UGC norms. Thus ETD fit with the strategic direction and mission of Shodhganga and makes research quickly available for the wider academic society (Shodhganga, 2015).

#### **4.The 'ETD' Survey**

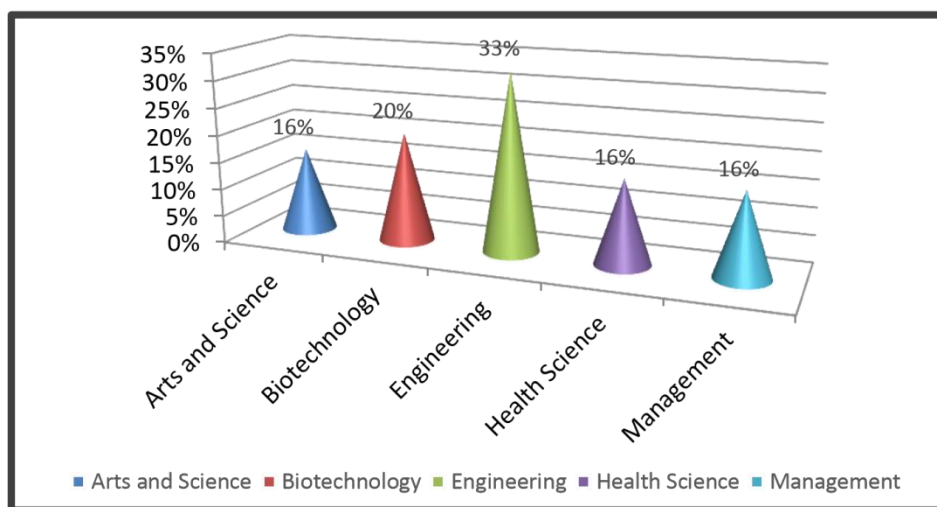
At the University, all the research scholars, on completion of PhD they are directed to upload their thesis on the Shodhganga ETD system. Edifying the ETD process will enable explore us to explore the benefits and evaluate the opportunities for action? A survey was done to obtain the pattern of ETD usage by the PhD fellows at University level. This survey follows the target objective, firstly to focus on the processing system of ETD, secondly to determine the practicality of ETD process and thirdly to identify the strategies (opportunities) for betterment. The survey has 45 carefully chosen multiple choice questions with a space to write users ETD experiences as points of suggestions. It was a 3 paged A4 sized paper.

The population of survey comprised of departments such as Arts and science, biotechnology, engineering, health science and management studies. The departments involved were surveyed randomly and they were recruited from all the disciplines of the University. Survey was sent by email and by paper. The survey questionnaire was distributed by the end of August 2016 and the responses were collected by early September 2016. On the basis of sample size table (Rea & Parker, 2014), the minimum sample size required was 42 to attain 99% level of confidence. In this study though the time period was constrained 64 participants (samples size) participated from a population of 210 scholars. The sample frame was compiled from the doctoral study registry and research and development board. Out of the 210 questionnaires sent, 64 participants returned the completed survey, this provided a response rate of 30.4%. On comparing the response rate with other similar reported surveys it varies from 10 to 22% and more (DiMichele, Hoots, Pipe, Rivard, & Santagostino, 2007; Ocal&Babin, 2016). The response rate received from the participants in this research was

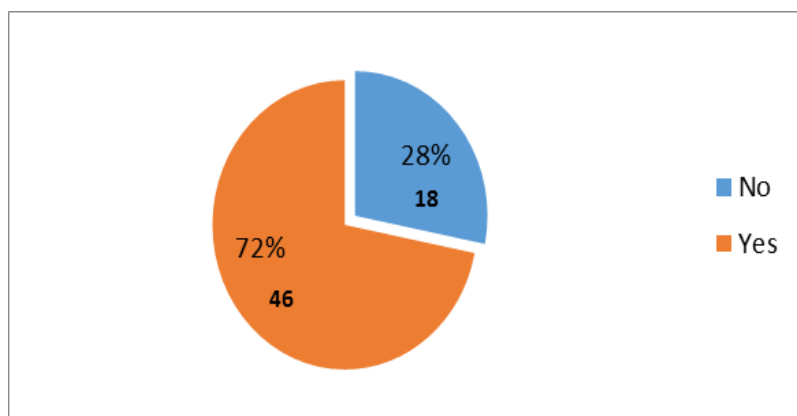
sufficient to accurately describe the level of ETD usage by the fellow PhD participants. The result in general is an indicative guide of the ETD usage at the University, which is sufficient to indicate the true findings.

### 5. Participants Profile

The University has multi-disciplinary programs and participants were spread across different specialization (see Figure 1). More number of participants (33%) were from Engineering and Technology, followed by Biotechnology (20%) and similar range of participation (10%) was seen among health science, management studies, arts and science. Commonly it is agreed that these types of survey on E-technology attract those who use information technology when compared to those who don't. However, the involved participants' data inference index indicates that all the departments irrespective of specialization use information technology which in this study is the ETD.



**Figure 1: Participants profile**



**Figure 2: Participants awareness of ETD (number of % (n) participants)**

At the University though ETD submission commenced a year ago, majority of 72% participants (Figure 2) acknowledges that they were aware of ETD system and 28% of the participants were unaware. This information indicates that it is essential that the information on ETD must be disseminated to all potential users of ETD. The illustrated figure 2 indicates the current knowledge of ETD among the research fellows was satisfactory. Anecdotally 90% of the surveyed participants agreed that ETD was essential to address the research, through others came to know about ETD recently with our survey and that's a good yield of the created survey. It was exciting to note that more than half participants were using ETD for purposeful extended search and usage.

### 6.1 Findings: The Usage Pattern Of 'ETD'

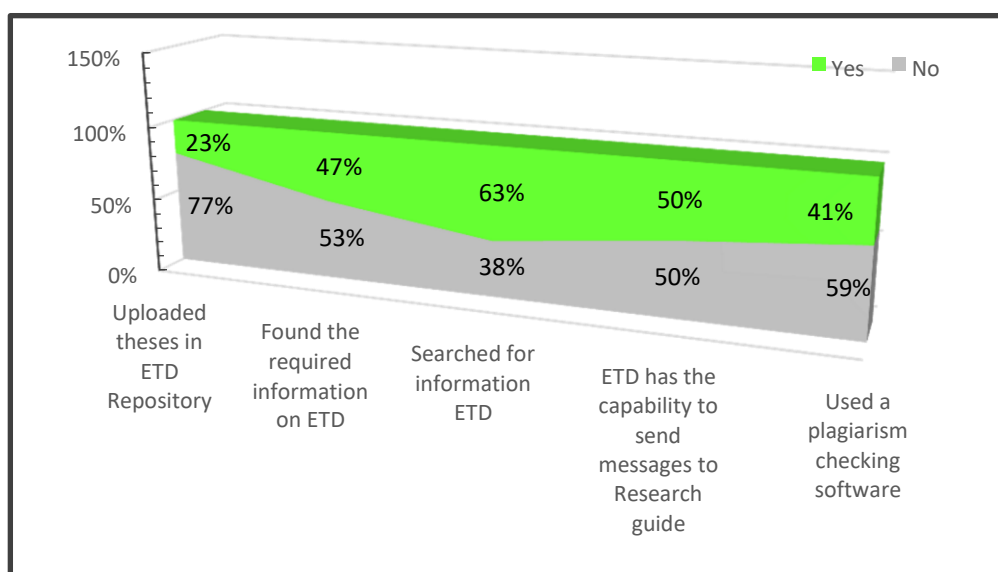


Figure 3: ETD usage pattern

#### 6.1.1 Thesis Upload on ETD Repository

The participants were asked on their level of ETD usage informing their exposure to upload their thesis on ETD online site. Figure 3 represents that only 23% of the participants had uploaded their thesis and numerous (49%) participants had not made an effort to upload their thesis on ETD site.

#### 6.1.2. Information Search on ETD

It is important to determine if the participants had ever searched for any required information of research on ETD site. It was found that more participants (63%) had looked and searched

for information and the remaining proportion of participants had not looked on to the ETD site for any information. This suggests that an important research arena is remaining unnoticed and unused by few essential others.

### **6.1.3. Found the Required Information on ETD**

Even though majority of participants did not upload their thesis on ETD, considerable proportion of participants (47%) had browsed and used the ETD site and found the searched information pertaining to research and related matters. This intimates that ETD had advanced further to inform the other original research. In reality at the same time the remaining proportion of participants hadn't visited the ETD site for literature search, this predict the need for the dissemination of advanced knowledge on ETD.

### **6.1.4 Report on Thesis Upload**

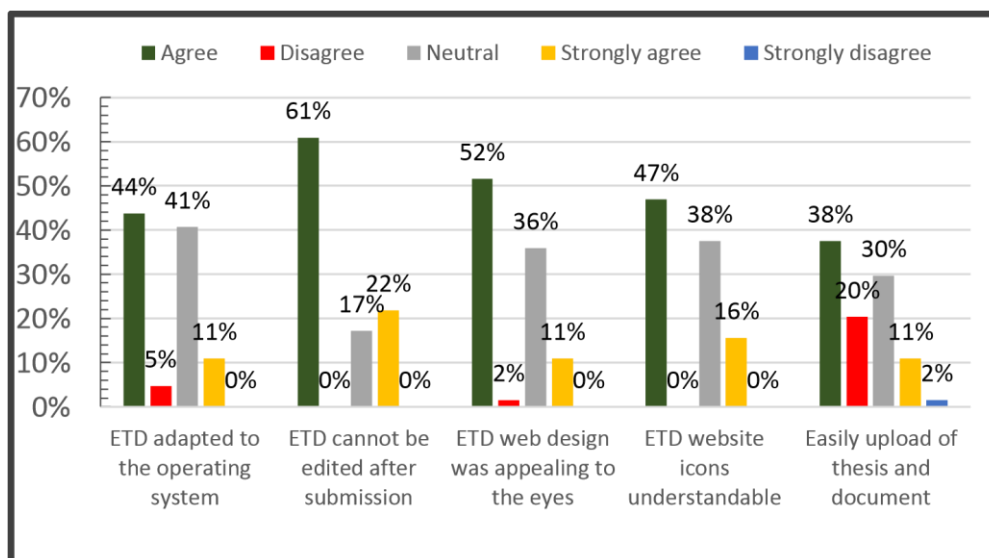
It is essential for the research supervisors to be intimated on their research candidate's status of thesis upload on to the ETD system. The survey reveals that equal proportion (50%) of participants acknowledged that the thesis submission report was sent to the concerned research guide. Having the research supervisor to be the chief research investigator bearing the core responsibility of the research study, the ETD system must facilitate instant messages to the research supervisors and their research candidates on successful upload of ETD.

### **6.1.5 Used Plagiarism Checking Software**

Plagiarism is a 'no-no' behaviour expected from the research community. Through the survey, the participants were asked if they had checked their thesis for plagiarism. Only less than half (41%) participants had checked their thesis on appropriate plagiarism software. The participants informed that some were using free plagiarism checking software. This intimates the unforeseen risk involved in their academic work which may leak through the unprotected system.



## 6.2 Practical Application of 'ETD'



**Figure 4: Practical application of ETD by the users**

### 6.2.1 Adaptability of ETD with the Operating System

Practical application of ETD is highly important to be assessed (Figure 4) to determine if the online ETD measures work in a desirable way. The participants were asked to rate if the ETD upload had no problem as a user with their work desk operating system such as Mac, Windows etc. Most of the participants were using windows operating system to produce their thesis and comparatively more number of participants (44%) agreed and (11%) strongly agreed that the ETD system adapted their operating system.

### 6.2.2 Option to Edit After Electronic Thesis Submission

It is important to note that once the thesis manuscript is approved and submitted electronically, the content must remain the same. Most of the 61% participants agreed and in addition, 22% participants strongly agreed that it was not possible to edit after submission, which is a good remark. It was evident that none disapproved the same.

### 6.2.3 ETD Online Site Appealing to the Eyes?

It would be nice if the website be appealing on the eyes of the end user, which would motivate the user to better use the website. The participants gave an upright response and 52% agreed as along with 11% participants strongly agreed that the ETD website was

appealing to their eyes. This creates an avenue to make the better best for the user to use the website with affinity.

#### **6.2.4 Understandable ETD Icons**

It's common for the user to acquaint with the website if the icons (tabs) were understandable. This informs that the participants were looking seriously on the particulars of the ETD website. Enormous participants agreed (47%) and strongly agreed (16%) to the verdict. However it should be noted that remaining participants stayed neutral to the cause. This informs that, what is already available is appreciable and improving for better would be substantial.

#### **6.2.5 Submission of Electronic Thesis with No Problem**

Producing the thesis by itself is a hard work and submitting it for open access shall promote more users. 38% and 11% participants respectively informed that they were able to upload thesis with no hindrance. At the same time the remaining participants were neutral and others encountered difficulties in thesis upload. This apparently would have consumed time in submission process.

### **6.3 Opportunities for Improvement**

The expressed opportunity for improvements (Table 1) was the need for the ETD makeover by having possible uniformity in thesis pattern. An opportunity for improvement is to advocate the potentiality of ETD. The scholars must be oriented about ETD at the start of their academic career and not just as a mandatory procedure to upload thesis at the completion of PhD degree.

The ETD cost was the University's responsibility and not be researches. This was reflected by the participants response, as the cost was not a barrier for using ETD. The 100% of participants reported that the ETD process was a milestone achievement to capture and refer their thesis online. Additionally participants intimated that ETD is a cost saving and efficient strategy. On uploading electronic thesis the alumni and research supervisors were manually informed so they can link it with their web page. This step was undertaken by the University to encourage other staff to view seriously on scientific papers. Once again it must be noted that improvements are on-going process. Eventually ETD authors will join the scholarly staff who understand the benefits and utilise it to the fullest.

<b>Opportunity for improvement</b>	<b>Suggested recommendations</b>
<i>The ETD online space for the title, abstract and keywords insist removal of special characters. Certain times it compromise the meaning of the sentence</i>	<i>Thesis submission format to be standardized from central to state level</i>
<i>Thesis upload was a long process particularly for the pages with figures</i>	<i>Easy to use database and steadfast server are to be considered</i>
<i>Confirmation email to be sent on initial appearance of thesis for public view</i>	<i>Automated confirmation response on successful thesis upload to be considered</i>

**Table 1: Suggestions and recommendations of ETD**

A noteworthy discussion arose on the master's level thesis repository. Similar concerns have been raised at UGC conference held in 1997 that pointed out that master's thesis are beginner entry level researches. Even if their research were original, the quality has to be improved before making it openly available. At the University, the decision was to initially focus on PhD thesis and revisit master's dissertations once ETD runs over a period of time. Another, mentioned opportunity to be thought about was the 'copy of record'. Certain universities with ETD program don't require submission of thesis by paper, but in other University ETD may be voluntary. Would the University library need to collect the paper copy of the thesis and shelf it in addition to electronic copy? Decision has to be made to consider which is to be the 'copy of record' (Bevan, 2005). To overcome this issue the shelf copy and electronic copy both should be exactly the same. In addition repository security was suggested by the participants. Firstly the student candidate must sign a confirmation form informing that the two are the same. Secondly, they must be cross checked to confirm, and thirdly a message to draw the attention that the paper bound thesis is of the copy of record can be endorsed.

Electronic thesis manuscript must be retrievable not just through google but also through scholarly search engines like google scholar and so on. ETD enables academicians to motivate electronic print and empower the

Institutional with institutional repositories. At the institutional level the choice of ETD software must be that which is accepted by the central governing body. In a way, electronic theses will propagate more eprint repository. To insist further, ETD stores original research

reports and documents with detailed information on research. Open access of ETD will improve the quality as it will be available for more people to read (Hirwade, 2011). Technological literacy need to be improved by ETD programs and enable scholars a quick access for research (Middleton et al., 2015). It was strongly suggested that the ETD community must consider these as opportunities for improvements.

## **6. Discussion**

In the past, the quality of the University was associated with its library and in the future it will be associated with the proportion of ETD at the digital library. ETD will also be a marketing strategy for Universities to be looked favourable. Standardizing ETD process from central to local will be a path to amend. Though many universities had made ETD submission mandatory only few had developed ETD repository at their institutional level (Swain, 2010).

Many libraries have not volunteered initiation to make local ETD desk. Therefore it may not be surprising that even prominent professors, academician and administrators aren't sufficiently aware of the growing significance of ETD usage. The other reason could be they aren't prepared to give-up on printed thesis. Else the librarians weren't skilled enough to develop and maintain ETD repository (Chen, 2005; Seeman et al., 2016). If not it could be because of the lack of adequate infra-structure. An affiliated national body must ensure that adequate training be provided for staff to update their skill on information technology. Training must not only focus on to foster knowledge on ETD use, such as skill training on thesis uploaded but should also provide comprehensive training on potential database including knowledge on trouble shooting. Opportunity must be taken to participate in conferences and workshops to gain updated knowledge on ETD repository. Widening the skills will enable overcome the barrier of ETD. Currently ETD is only used at a basic level to upload thesis. To intensify the ETD usage, existing infrastructure need to be improved and educationalist must be familiarised with better contributing knowledge (Dhanavandan&Tamizhchelvan, 2013; Hirwade, 2011).

The top advantage of ETD is avoidance of research duplication and ensured faster retrieval of information to promote shared resources by addressing the space (i.e. the storage issue) problem (Hirwade, 2011). Archived thesis can also be scanned. The process should be such that while a relevant record of thesis is searched on the internet, the user must be able to click a link providing access to the full text. It is now time to appraise the ETD applicability by

policy makers, administrators, professors and academicians on the necessity of ETD for learning, teaching and research. Importantly the librarians as information scientist are to take initiatives to make progress in this crucial area.

## 7. Conclusion

In conclusion, the decision is to pragmatically move forward by taking steady approach to make improvements and develop further in future. Essential steps to move forward are to be taken to ensure that the concept of ETD and its application are readily available for the scholars. This will enable them to understand the appropriate pattern of the thesis submission. Innovations are discovered by researchers and ETD will be a recruitment tool for scholars and it will also enable them to attain scholarship (Ezema& Igbo, 2016). A systematic unified approach is essential to maximize the outputs from the ETDs. Academic resistance if raised can be managed by tailored registry of ETD submission process (Balasubramani& Abu, 2015; Moeti, 2005). It will be an advantageous start to initiate ETD methodology proposal by moving forward in electronic submission of thesis. As thesis are examined, marked and approved, the approved thesis can be forwarded to the server for upload. Additionally a paper record copy can be retained. Once standardization of ETD protocol is achieved the electronic thesis submission will dwell in minimal or no cost (Brogan, 2006; Chakravarty, 2016).

In the near future, it is likely that ETD process shall be refined and easy to use by ensuring the essential infrastructure. It is a fact that e-network has a major impact on the way University process ETD (Schopfel et al., 2014). A suggestion for further study based on this research, would be to use the ETD survey of this study throughout other states to identify the pattern of ETD usage. In addition comparative study can be undertaken on stack of repository. In future ETD usage will be a trend.

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