

# **Open Access to Public Funded Research: A Discussion in the Context of Mahatma Gandhi University Digital Archives of Doctoral Dissertations**

**Prof. Peter Suber<sup>\*</sup>**

Open Access Project, Public Knowledge, Washington, D.C.  
peters@earlham.edu

**Dr. R. Raman Nair**

Mahatma Gandhi University, Kottayam, India  
ramannair.r@gmail.com

**Sri. K.H. Hussain**

Kerala Forest Research Institute, Trichur, Kerala  
hussain.rachana@gmail.com

## **ABSTRACT**

The importance of doctoral dissertations, the extend of public fund utilized for their production, need for their open access, concepts of Open Access (OA) and the arguments for and against it are discussed in detail. A brief historical outline of the attempts in India for digitizing and providing Open Access to dissertations is provided. The development of the Mahatma Gandhi University (MGU) Open Access Digital Archive is examined as an opportunity for other implementers and developers to gain both technical and non-technical insight. Suggests establishment of a national agency for ensuring OA to doctoral dissertations produced in Indian universities. Discussion on OA initiatives and the creation of OA Archive of dissertations at MGU can reveal to other institutions in India that it is not a costly or difficult task as generally considered. The paper can infuse interest and confidence to universities and research institutions in India to provide OA to their research works.

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<sup>\*</sup> This paper makes use of arguments and language from Peter Suber, with his permission, but he did not take part in the writing. We relied primarily on his article, "Open access to electronic theses and dissertations (ETDs)," SPARC Open Access Newsletter, July 2, 2006. <http://www.earlham.edu/~peters/fos/newsletter/07-02-06.htm#etds>

# **Open Access to Public Funded Research: A Discussion in the Context of Mahatma Gandhi University Digital Archives of Doctoral Dissertations**

## **1. Introduction**

Universities play a crucial role in the generation and application of new knowledge. Their contributions may belong to four major areas traditionally assigned: teaching, research, conservation and extension. Teaching is the systematic transfer of the sum-total of knowledge a society holds to its younger generation through well-structured courses and training programmes. Research is the pursuit of new frontiers of knowledge in whatever directions and extent possible. Conservation is the preservation and maintenance of cultural traditions and values of the people and the new knowledge generated. Extension is the reaching out in service of the society at large for making the generated knowledge useful. The success or failure of a university is measured by the contributions it has made in the above areas.

## **2. Universities and Research**

Research is a scientific undertaking by means of systematized methods to discover new facts relevant to the community or region. Old facts are verified and their sequences, interrelationships, casual explanations and the natural laws are analyzed. Research is incomplete until its results have been communicated. This is best done in print, where the background to the study, the details of methods, placing of new findings in the perspective of the old and the formulation of a hypothesis can all be exposed to the critical reader in a permanent form. The eminent physicist and science philosopher John Ziman once declared that 'the object of research is publication'. It is still not enough; whatever is published should be read as widely as possible. Also, publication of all doctoral dissertations produced is impractical. Some other methods are to be employed to expose the research works.

### **2.1 Research and Development**

Research has always been a source of excitement and incalculable benefit to the society. Findings were invariably accompanied by economic and political development resulting in social changes. In the pre-industrial society research was mostly a private affair. After the industrial revolution the pace of research was quickened to meet the growing demands of the society. Mounting population pressure, growing consumerism, fast depletion of natural resources, perceived need to have political or military edge, urge to save time and space, need to find cures for diseases ensuring health and long life – all these urged for planned, organized and coordinated research. Our security, health, education and economy became depended on scientific research. Tremendous progress made by the mankind, the economic

prosperity, military powers of big nations - all are only due to the availability of knowledge generated by research. Investment in research yields rich dividends. Since society subsists on information and knowledge, research has acquired new pace and dimension in the era of information society.

### **3 Doctoral Research**

India is home to more than 450 universities and research laboratories. Doctoral research comprises one subset of research for which India annually invests substantial resource worth over Rs 3000 crore. It produces approximately 30,000 dissertations each year. But still India is not having a reliable central repository of doctoral dissertations. The results of our doctoral research have not yet received due attention in further research and application. This is due to non-availability of information on earlier research as well as lack of access to the full text of the dissertations, which records the results of research.

Great interest has been put in e-thesis recently in India. Now majority of doctoral students produce their dissertation electronically. But no wide-scale activity has yet encompassed also for the storage and dissemination of these recent dissertations. Unfortunately there is no national-level policy on developing Open Access institutional repositories. There are few initiatives, but they all fall short of expectation of creating a nationwide Open Access repository.

This has led to various problems: from lack of visibility among academia to duplication, repetition and even plagiarism. Stature of Indian universities and their research has lowered significantly when compared with the ancient days. Most of the developed countries have created online databases where universities as well as researchers upload their dissertations. They provide Open Access to their doctoral dissertations.

Presently thesis collections in India remain as restricted collections in the university libraries only to be used by academic community from inside. Reach of research is not even one percent among their expected users. No one questions the relevance and utility of the doctoral research, but now a days it has been degraded into a mere formality for acquiring qualifications.

### **4. Open Access**

Open Access (OA) is free, online full text access to materials in digital form to any user from anywhere at any time over the web. OA enables users to link, read, download, store, print, use and data mine the digital document /material free of copyright restrictions for academic purposes. OA is thus very important for developing countries, which cannot afford costly

journals in which current research is published. The main aim of OA is to make publicly funded recorded output of research freely available for the benefit of the society. The Internet and permission of the author make OA possible.

Open Access Initiative (OAI) is now becoming popular in academic and research institutions worldwide. Open archives may belong to institutions such as universities, or disciplines such as physics, computer science, economics, etc. Authors may archive their preprints directly. Due to the spreading of OAI majority of publishers are now compelled to permit authors to archive their post-prints in open archives

## **5. Arguments for and Against OA**

Open Access to doctoral dissertations is now an important topic of discussion among faculty members and research scholars worldwide. There exists restrictions imposed by publishers to make books and journal articles open. Copyright law needs to be reformed by shortening of the term, reducing permission barriers, etc. Often these legislations are opposed by publishing industries. On the other hand dissertations carry no publisher's investment and OA of dissertation is free from the publishing industry. But in India with less than 2% of the dissertations becoming openly accessible majority of them remain totally invisible.

### **5.1 Difficulty for OA**

Books and journal articles require the copyright-holder's consent to bring them into OA. According to BOAI, the literature easily available for OA is the literature 'scholars give to the world without expectation of payment'. Such works are written for impact rather than money. Hence consent to OA causes no loss. Authors of royalty-producing literature think that OA will harm their returns. Dissertations are produced without expectation of payment. Research scholars use the resources and facilities of universities operating with public fund and therefore they should consent to put their work in public domain. Their consent is easier because dissertations are subject to the terms and conditions of the university. Some researchers plan to make books out of their dissertations that could generate revenue in future. But the book would have changed with some value additions to dissertations. So originality and historicity of the dissertation is unaffected by the publishing of books or journal articles.

### **5.2 Need of Mandates**

Now in western universities dissertations are submitted in electronic form. Indian universities have started to ask for an additional electronic copy during submission of dissertation. Dissertations born and submitted in digital form are easier to be made OA. Indian universities should amend their PhD Regulation so as to make electronic submission of the

dissertation mandatory. Getting an electronic copy of dissertation is not a hard step, but ensuring the electronic submission in the required format and standard is really hard!

Mandates work; suggestions and recommendations don't. This is the universal lesson from OA mandates to date, whether at funding agencies or universities. The US National Institutes of Health (NIH) has encouraged but not required OA to NIH-funded research. After a specific period it found that the compliance rate by its grantees was only about 4 %. By contrast, the Wellcome Trust mandated OA to research it funded since October 2005 and has enjoyed a nearly 100% compliance rate in the same period. In 2006 Arthur Sale summarized the results of different university policies on OA for doctoral dissertations: 'Voluntary Electronic Theses and Dissertations (ETD) deposition results in repositories collecting less than 12% of the available dissertation, whereas mandatory policies are well accepted and cause deposit rates to rise towards 100%'.

Universities are in a good position to mandate OA. They can make it a simple condition of submission and acceptance. Nowadays most dissertations are born digital. They're already electronic even if the university only wants to deal with printouts. Their authors lose no income by consenting to OA. There are no publishers in the picture to resist or oppose OA. There are no publisher fears of lost income to answer. Research students are more likely to see the benefits of OA by taking advantage of Internet to disseminate their research. There are no publisher permissions to seek. There are no publisher negotiations to delay or deter OA archiving. There is also no need for the universities to scan and digitize hard copies.

### **5.3 Visibility**

The benefits of OA for dissertations are wider visibility and greater impact. OA solves the invisibility problem. Without OA, there is almost no access. They are hard to retrieve even if discovered. When they are OA, dissertations are not only searchable by cross-archive search tools that index the dissertation archives; Google, Yahoo, and Microsoft also index them. Scirus already indexes the ETDs held by digital libraries of theses and dissertations.

By making dissertations visible, OA helps the readers who wouldn't otherwise have ready access. But it also helps the researchers boosting their visibility and impact just as it does for the authors of journal articles. Studies on OA citation advantage for dissertations are not available. But for journal articles it ranges from 50% to 250% and it's likely to be comparable for dissertations also. As per the personal experience of one of the authors (Raman) a dissertation on Agricultural and Farm Information systems of the author was accepted in 2005 by University of Kerala for granting PhD. University of Kerala has no institutional Repository or Digital Library of dissertations. The hard copy of the author's dissertation was

kept in Kerala University Library since 2004 and during five-year period of which it existed there less than 15 scholars belonging to the region of Kerala have read that at the Library. But a copy of the same was Published in ELIS the OA Repository for Library/Information Science, Computer Science etc in 2007. During the three years since that till the date on which we prepared this paper 1368 scholars worldwide have referred the abstract of this dissertation and 2117 scholars from different parts of the world have downloaded the dissertation from ELIS. Country wise statistics of these downloads is also available. It is USA 875, India 460, Australia 168, South Africa 39, Philippines 34. Europe 32, Ethiopia 32 and the like. Author has also received numerous critical comments and suggestions, which can help to improve the work before publication if it is going to be published as a book.

#### **5.4 Quality of Research**

There is a fear among a few that if university places doctoral dissertations in open domain research of inferior quality will be exposed to the world causing damage to the reputation of the institution and the scholars. It should always be remembered that Government meets 95% of the expenses for higher education and research, which is accountable. The public expense should bring benefits to the society. Other researchers, universities and government departments engaged in public service and the public at large bear the right to use the results of public funded research. Public has the right to evaluate the usefulness of a work done using public funds. The results of public funded research are more applied for the benefit of the society only if it is made open and kept freely accessible. Such dissertations are not intended to be kept in closed shelves. If death by obscurity is not to be the fate of our dissertations they are to be made Open Access. By doing so future research can be restructured qualitatively based on criticism by public.

All Research supervisors know that research scholars work harder and do better work when they know they are writing for a real audience --large or small-- beyond the supervising teacher. Some supervisors arrange to give students a real audience beyond the teacher. Now most Indian universities conduct seminars for defense of the dissertation by the scholar, for which teachers and scholars from concerned subjects from the university and near by institutions are invited.

OA gives scholars a real audience beyond the dissertation committee and the participants in the defense seminars. It gives the scholar real incentives to do original, impressive work. It's safe and easy to fool committees, but risky and difficult to fool the world when their works are put in an OA Archive.

## 5.5 Seriousness in Research

In doctoral research university demands the student for a new and significant work of scholarship, but doesn't disseminate the work publicly. Dissertation committee takes it seriously as a work of scholarship, but the university is unable to do what it should do when its scholars produce a new and important work: it doesn't apply its publish-or-perish policy. This policy not only proclaims that research good enough for internal recognition is good enough for external distribution. It also proclaims the stronger converse that only research good enough for external distribution is good enough for internal recognition.

Universities by their public dissemination mandate want the world to know about the quality of the work done there. It wants other researchers to benefit from it. By making the dissertations open universities send the right signal that it's a significant. Without an OA mandate, the university is saying that it doesn't care whether the dissertation is publicly disseminated or not. The message should be: If we approve a dissertation, then we think it's good. If we think it's good, then we want others to be able to find it, use it, and build on it.

So OA to dissertations is highly connected to the purpose of universities and the value of scholarship. By accepting OA a university declares that ; it will do all it can to help the research scholar do good work, and then it will do all it can to make their good work available to others." It is the mission of a research university.

## 5. 6 Public Fund

Public funded universities and research organizations should make it mandatory for their teachers and students provide OA to the results of their research. There should be contracts to be signed at the time of registration as student or when accepting faculty employment. If the student uses public money, student will have to provide OA to his or her research; if this bothers him/her then student can abstain from taking public money. Then the student has to bear the full actual expenses for the facilities offered by the university. Their might also be similar employment contracts: if one work in the university one will have to provide OA to his or her research; if this bothers him or her, then he can reject the offer for employment in the university. An OA mandate for doctoral dissertations is to be taken in this sense.

OA mandate for doctoral dissertations advances the university's interest. The student's work gets greater visibility and impact. OA mandate will elicit better work. It tells students that the university is taking the dissertation seriously as scholarship. University thus fulfills its mission to share the knowledge it produces, and assists researchers elsewhere who could benefit from this knowledge. Such an OA mandate is fundamentally consensual, not coercive, and

aims at benefits far beyond the student-authors themselves. OA mandate should apply to all dissertations approved by a university from its beginning.

## **5. 7 Future Publications**

Some students fear that providing OA for their doctoral dissertation will disqualify it for future publication. For decades most western universities have submitted their dissertations to University Microfilm International (UMI), which distributed copies on demand by xerography or microfilm to paying customers.. This has not disqualified any scholar from later publishing those dissertations as books or journal articles.

The OA metadata helps the dissertation become known to others and could even help the author gather citations, impact, and reputation while submitting articles to journals. Many studies including that of Gail McMillan have found that the ready availability of dissertations on the Internet does not deter the vast majority of publishers from publishing articles derived from doctoral research.

Some students make patentable discoveries during their doctoral research and want time to apply for the patent. There is no need to force students to disclose their research before they have had a chance to patent their findings. In such cases full text can be temporarily blocked. Students may quote extensively from a copyrighted work, or reproduce copyrighted illustrations, and don't have permission to redistribute them. In some other cases student would have already published some chapters as journal articles, and have transferred copyright to the journal, and doesn't have the journal's permission to redistribute it. But university regulations should require students who publish articles before finishing their dissertations either to retain key rights or to give up hope of using the articles in their dissertations. Students can publish and get the rights they need either by publishing in an OA journal or in a non-OA journal that permit post print archiving.

## **5.8 Preservation**

Paper dissertations are not like published books that exist in hundreds or thousands of copies. They're usually unique and therefore vulnerable. They can even be stolen from the University library. Universities could lock them up in special collections, but this is exactly the wrong model of stewardship, as if preservation and access were incompatible when the purpose of preservation is precisely to increase, facilitate, and perpetuate access. Moreover, OA to the dissertations is perfectly compatible with the existence of paper copies in the university library and with microfilm copies at UMI.



The case of MGU archive is a good example. MGU started the project to digitize its doctoral dissertations 2008. It was supposed that all the dissertations were stacked in the University Library. When examined in connection with the project, the holding was found to be approximately 850 dissertations. The Official records available told of about 1006 dissertations. A printed bibliography of dissertations accepted for PhD degree was published during the project. The scholars who referred the bibliography supplied information about another 150 dissertations, which increased the total number of dissertations to 1156. It was found that approximately 300 dissertations were not available in the university library. A campaign to collect these non-available titles from Research scholars and guides presently working in various parts of the country and abroad has already been started which can make the collection complete. So launching of OA Digital Archives has helped the university in many ways to ensure collection and conservation of all dissertations.

## **6. OA Archives Initiatives in India**

National and international projects for OA to Dissertations have already been initiated in many countries. Notable projects are Edinburgh's Theses Alive project (2004), JISC's Electronic Thesis Project (2005) and UNESCO's ETD project (1999), which called for "equal access" to ETDs. The international Digital Access to Research Theses (DART) project is committed to OA for ETDs.

Many initiatives have come in India for Open Access Repositories of Doctoral Dissertations since 1995. They all fall short of expectations. Some of the important initiatives are listed below.

The first OA Repository of Doctoral Dissertations was envisaged in India in 1995 under Dr. A. M Michael, Vice Chancellor of Kerala Agricultural University (KAU). This was a subset of the Kerala Agricultural University Library and Information System (KAULIS). With support from ARIS programme under ICAR, KAU digitized 400 of its 3000 dissertations in 1997-98 at a cost of less than Rs. 3 lakhs. At that time even the term digital library was not heard in India. Special packages for digital libraries were not available in India or abroad at that time. Unix based TechLib Plus was the only package fit for the work, but was beyond the financial powers of Indian university libraries. For a short period after it's launching the KAU archive was available in the Intranet and Internet. The Vice Chancellor and the staff involved in the project left the organization due to political interventions. Even though ICAR was prepared to provide funds for support and development of the digitization project remaining dissertations were not added to the archives. In 2000 it went non-functional along with KAULIS project for which an amount of 9.5 crore rupees had already been spent for infrastructure facilities.

Though the dissertation archive under KAULIS was not sustained, this project infused interest in many organizations in ICT field. Under an NGO named Centre for Informatics Research and Development (CIRD) further research on digital archiving progressed. CIRD developed a powerful package in 2000 named Nitya that could process Malayalam and English scripts for full text digital archiving. The digitized dissertations at KAU were exported to Nitya by CIRD in 2000 voluntarily, which revealed the power and possibilities of the emerging concept of digital archiving. Later the package Nitya was experimented and improved in various digital archiving contexts. By then various free digital archiving software like GenISIS, Greenstone and DSpace developed by international organizations have come into the scene. But Nitya remained unique for Indian contexts due to its power to process local scripts.

Later in 2003 Mysore University has taken up a project named Vidyanidhi, which is to create an online database of all doctoral dissertations published by Indian universities and an OA archives of their full text. It used the free software DSpace. It was sponsored by the Union Science and Technology Ministry and was supported by Ford Foundation and Microsoft. Till now the project could archive only less than 10000 of the approximately 11 lakhs dissertations produced in India. Its coverage is less than 2%. The database contains about 100000 bibliographic records, i.e. approximately 10% of the dissertations available in India.

INFLIBNET under University Grants Commission (UGC) has also attempted a similar project, but could not succeed in materializing reliable full text archives of dissertation from Indian universities. The project could only develop a bibliographic database of 2.25 lakhs (coming to approximately 20%) of dissertations of about 225 institutions in India.

In 2008 Mahatma Gandhi University launched its OA Archives of Doctoral Dissertations. It is the first official, authentic and reliable OA Archive of doctoral dissertations of any Indian university. It hosts all the accepted dissertations available in the university. The project claims that all future dissertations will be uploaded within one week after their acceptance and issue of degree by the university.

There are some more efforts to provide OA to dissertations, but generally they are all either very small in terms of number of documents or are not functional due to lack of proper maintenance. They are not official sites and they do not contain all or even a major portion of available dissertations of a specific university or group of universities. They are unable to guarantee the continuity of the project and updating of the archive. Many are launched experimentally as part of the workshops/ training Programmes on digital archiving packages conducted in concerned universities.

Overall picture is that efforts for OA to doctoral dissertations in India are small, fragmented and lack holistic nature. They fail to bring the vast amount of dissertations produced by Indian universities and research laboratories to the scientific community at large. These collections kept are relatively unknown to researchers outside the concerned university.

## **7. OA Archives of MGU Dissertations**

Open Access Digital Archives of Doctoral Dissertations launched by Mahatma Gandhi University (MGU) is an internal initiative without any directions or funding from external agencies. MGU was established in 1983. It has to cater to the higher education of Central Kerala and has seven faculties for Science, Fine Arts, Commerce, Engineering and Technology, Technology and Applied Science, Ayurveda, and Homeopathy. At present the university offers research facilities and guidance in over 40 disciplines through its own departments and about 150 approved research centers. The university has research collaboration with various national and international organizations like UGC, CSIR, ICMR, BARC, ISRO, Toronto University, Max Plank Institute of Technology, Edinburgh University, Ruth Cohn Institute, etc to facilitate inflow of cutting edge of technologies and methods. The university has awarded about 1300 doctoral degrees in various disciplines during 1983-2008.

In its Silver Jubilee Year 2008 University initiated the development of an Open Access Digital Archives of PhD Dissertations approved by the university.

### **7.1. Launching of the Archives**

Being the first official Open Access Online Digital Dissertations Archives of any Indian university MGU archives need attention. It covers dissertations in English, Malayalam, Hindi and Sanskrit accepted by the university during the past 25 years. H.E. Dr. APJ Abdul Kalam, Former President of India on 9th November 2008, launched the OA archive. From then on entire knowledge generated by doctoral research at the university is accessible through the web. A few remaining back files will be uploaded shortly and new dissertations will be added as and when they are accepted. This is the biggest official collection of its own dissertations any Indian university could host on web. Indigenously developed software is more user-friendly and efficient than many digital library packages in use.

### **7.2. Objectives of MGU Online Dissertations Digital Library**

- To enhance exposure to the academic research conducted in the university
- To avoid duplications and plagiarisms in research
- To enhance quality of future research and trigger further investigations

- To ensure accountability, transparency and responsibility of research
- To provide opportunity for social audit of research
- To provide Open Access to knowledge generated by the University

### **7.3. Software Features**

Beehive Digital Concepts, Cochin, in close association with MGU developed the software; web enabling the Nitya Archive package developed by Center for Informatics Research and Development, (CIRD). MGU Online Digital Archives of Dissertations applies this special archiving package for hosting dissertations in the web. The package has multilingual search facility and satisfies UNICODE standards.

The search mechanism is based on Nitya Digital Archive (dArch). The specificity in search and retrieval offered is commendable and its metadata can be made OAI-PMH (Open Access initiative – Protocol for Metadata Harvest) compliant. The following are the important features of the archive.

- The Archive can host any number of dissertations in English, Malayalam, Hindi, Sanskrit, Tamil and Kannada.
- Provides facility for multi keyword search using advanced Boolean search for accurate and relevant search.
- Facilitates multilingual data input and Boolean Search
- Dissertations are not password protected to access and view
- No need to download the Dissertations to read them.
- Compatible with any browser on any operating system
- No need for additional software like java or flash. Only browser is needed.
- Accessible from anywhere at any time through the URL <http://www.mgutheses.org>

### **7.4. Technical Data**

- The Archives is hosted on a live and dedicated Linux Server, catering thousands of simultaneous requests without performance loss. The server is secure and available all time.
- The project is built on PHP programming language in combination with MySQL.

### **7.5. Unique Features**

- Exhaustive collection of doctoral dissertations.
- Retrieval of specific pages/sections together with the entire dissertations.
- Open database structure allowing future migration to OAI-PMH compliant packages

- Query building and searching using English, Malayalam, Hindi, Tamil and Kannada scripts.



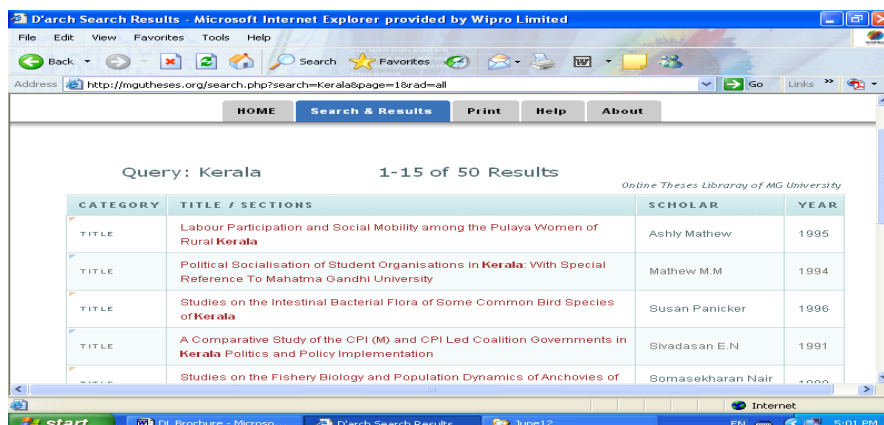
Home page of MGU Dissertation Archives at <http://www.mgutheses.org>

## 7.6. Using Online Dissertation Archive

Of the dissertation archives hosted in the net by institutions worldwide using DSpace, Greenstone and other packages MGU Archive has a simple and user-friendly interface similar to Google. Other packages retrieves entire dissertations while searching for a specific key word and then users have to manually navigate to reach the required page. In MGU archive the search directly takes user to the concerned page of the dissertation but users can navigate to other portions of the dissertation also.

The MGU dissertation archive is located at <http://www.mgutheses.org>. For a simple search subject keywords are to be entered in the search box in the Home page. It can be words that may occur in the title or possible or bookmarks in the dissertation.

### 7.6.1. Getting List of Relevant Dissertations



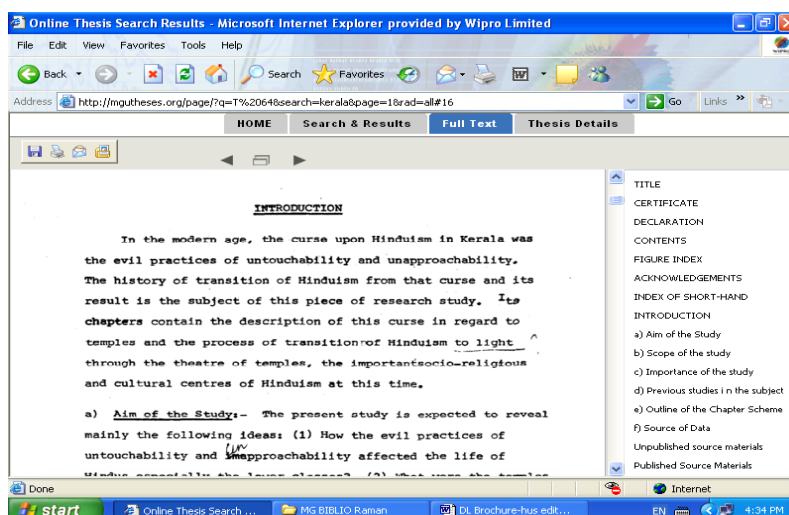
Clicking the 'Search' button, all the titles of the retrieved dissertations are first displayed. After that all the sections in other dissertations related to the query are listed.

The hit list of dissertations by a query can be printed for future reference. From the hit list user can click the required title and go to a particular section or entire thesis.

### 7.6.2. Navigating Through Full Text

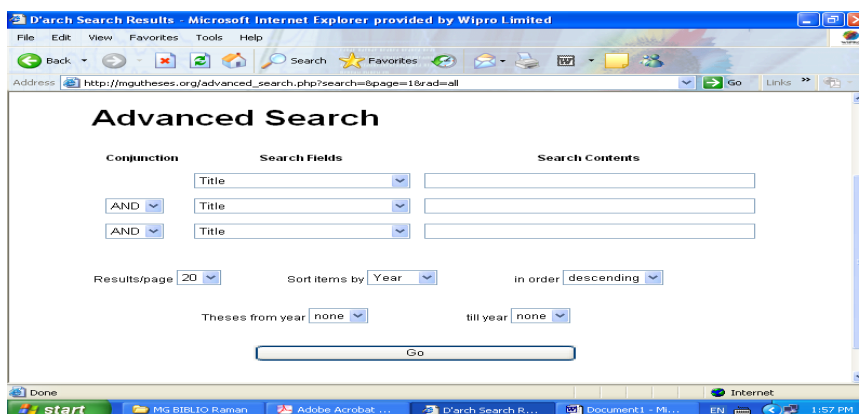
Once the full text is opened user can navigate through entire thesis back and forth. Bookmarks provided on the right side of the screen helps to go to the relevant chapters instantly.

Downloading the dissertation is not permitted presently. Subject to detailed discussion at MGU University and after watching the development that may occur in other Indian universities these permissions will be provided.



### 7.6.3. Advanced Search

Searches can be made selecting categories like Title, Scholar or Guide. 'Advanced Search' option lets the user to build complex Boolean queries.



#### 7.6.4. Multi Lingual Search

Since Online Nitya is Unicode compliant dissertations in any Indian language can be archived and retrieved using local scripts. MGU Online Dissertations Archives is the only bibliographic information system presently existing in Kerala having multilingual search capability using English, Malayalam and Hindi scripts. A visual Malayalam keyboard is provided to construct queries for those unfamiliar with Inscript keying.



Online Nitya will be an effective model for a regional dissertation archive in Kerala or even South India. Kerala University and Kannur University can now think of an effective way of archiving their Tamil and Kannada dissertations in line with MGU archive along with their English, Hindi, Sanskrit and Malayalam titles.

#### 7.6.5. Bibliographical Data of Dissertations

Clicking the tab 'Theses Details', users can get full bibliographical data of the thesis.



## 8. Reactions and Response to MGU Archives

Examining the OA Archives hosted in the Web during its launching and searching on some topics of his interest Dr. H E Dr. A P J Abdul Kalam, the Former President of India stated that the project is an important step towards democratization of knowledge. He also stated that he was sure the model of digital archives created by MG University will be emulated by other Indian universities leading to transparency in the education system. Lauding the efforts of MG University in presenting umpteen numbers of approved doctoral dissertations to the public domain through Open Access Dr. Richard M. Stallman, the Father of Free Software Movement stated that he was always for the freedom to redistribute such research documents and thereby widen the reach of public funded research activities. He commented it as an important Open Access Initiative in India. Dr. Jagdish Aurora, Director, INFLIBNET Center, an inter-university center of University Grants Commission (UGC), Government of India remarked it as a major achievement under Indian higher education system. There were hundreds of mails from faculty members of different universities, and students and teachers of MGU giving critical comments, suggestions and statements for and against the putting of doctoral dissertations in public domain as well as the technical aspects of the archives. Two sample comments/Reviews are listed below:

Comment Received from Professionals at Columbia University:

- Using wildcat (\*): search produced results. So this database supports using wildcat operator. (Query: fatt\* acids 1-5 of 5 Results). fatty acids and their role in coronary diseases. Query: 1-4 of 4 Results
- Google Basic Operators: (a). Query: Sanskrit +literature 1-1 of 1 Results. (b). Time : Query: Malayalam literature.1980 1-2 of 2 Results. (c)..So it supports Google Basic operators
- Basic Boolean AND: Query: Malayalam AND Tamil Literature 1-0 of 0 Results.
- Basic Boolean OR: Query: Fatty acids OR Lipoprotein 1-0 of 0 Results.
- Case Sensitivity: This is not an issue here. Ex. Query: myocardial infarction 1-3 of 3 Results
- Advanced search: Good performance.
- Easiness for Faceted Navigation: Not observed. Ex. Query: Malayalam Literature- ManiPravalam -Venmani Kavitalak. 1-0 of 0 Results
- Additionally please consider the following: a. Google book Search uses a host of tools to track the users. Are there any tools to track the use of the thesis archive?. Copyright issues should be clearly mentioned. User- tracking tools may be used.



Another professional from inside the country wrote: There is no doubt that this project is the first one in its genre among Indian universities other than Indian Institute of Science (<http://etd.ncsi.iisc.ernet.in>). But the number of theses in MGU Archives (809) is far more than that is available in etd@IISc (327). Vidyanidhi is the only theses collection larger than this existing in India. But putting all the theses from different universities its size is 8313 only. It is appreciative that exclusive software was developed for MGU project. The Homepage of the site [www.mgutheses.org](http://www.mgutheses.org) is simple and neat, just like Google homepage. Giving links to this new site in the university site will increase its visibility. The online keyboard provided is an advantage. But it is not available in systems, which does not support Unicode. Same is the case with the Help page also. One can see only boxes in the place of letters. (I could not explore much in these feature as my system doesn't have Unicode support. In the search results page, the Search button is available, but there is no text box to enter a query. If a text box available one can modify his/her search in the search results page itself. Some minor points in the content are in the About page both NITYA website and D'Arch website no required information is available.

A research guide from inside the university wrote: Most of the inventions responsible for the awards of the theses from our laboratory are either patented or under the process of patent protection. The access of these thesis in the public domain will certainly mounts to infringing the rights of IPR of the inventors. Please note that the inventions were aroused from three DST (Dept of Science and Technology, Government of India) sponsored projects. In this background I request your high offices to with draw the entire thesis awarded under my supervision.

## **9. Conclusion**

In the last quarter of the century Science and Technology has triggered great changes in the country. Infrastructure for research, education and extension activities experienced fast expansion. During the period MGU also has made commendable contribution to the generation of knowledge, which is applied for development in different spheres of life in the region.

The MGU archives of dissertations reveals that the university has produced doctorates in highly relevant and emerging areas of science like biotechnology, genetic engineering, biodiversity and environmental conservation. The works in the archives covers very important areas like traditional medicine, use of various plants found locally in the treatment of various diseases, cancer research, rubber research, etc. The Archives also includes highly cited works in areas like Polymer chemistry.

Doctoral dissertations form primary sources of data for further research. But doctoral dissertations in Indian universities are distanced from potential users due to the traditional ways of closedness and privacy. In spite of investing high money for every research work, other researchers can neither utilize its findings nor are they cited widely. Research results have become hardly useful and lack of awareness causes duplication in research. This seems a continuing phenomenon in higher education even though advancement in ICT has made excellent means of access to the results of research.

The failure of national projects for digital archiving is due to lack of strict rules for maintaining OA repositories and for providing data to the concerned central agencies. National level projects could not even after a decade of work get 5% of the dissertations approved in India for ensuring their accessibility by the public or collect 20 % of their bibliographical data. UGC can create a change constituting mandatory rules and standards. OA archives of dissertations should be made a prime condition for UGC funding.

A national level policy should be framed on submission of dissertations in electronic form and on maintaining OA Repositories. A National Network of Digital Archives of Doctoral Dissertations in traditional universities, agricultural universities, Indian Institutes of Technologies, IISC and other research institutions can be thought of and It can be at INFLIBNET, NIC or Vidyanidhi Project. The system can give leadership to the back file digitization, and preparing standards for creation and preservation of electronic dissertations. A time limit should be prescribed for back file digitization and the central agency should co-ordinate the work. As seen from the experience of Mahatma Gandhi University it is not a costly or time-consuming task. By spending less than Rs. 25 lakhs MGU could digitize and host its 1000 dissertations containing about 2.5 lakhs pages in six months time. If UGC could seriously consider the matter all Indian dissertations can be brought into OA repositories in a year.

Every university should be capable of hosting an OA archive of its doctoral dissertation and newly accepted should be added to it within a week of its acceptance. Central agency can then make these individual repositories appear as one seamless digital library of dissertations by gathering all the metadata into a central search engine. When a potentially relevant document is found, the user will be redirected to the concerned institutional repository. This approach is supported by the Open Archives Initiative (OAI), which has developed a protocol for exchanging such metadata. Using the OAI's protocol for Metadata Harvesting (OAI-PMH), individual sites can make their metadata accessible to providers or discovery services, while maintaining complete control over own resources.

Such archives will be accessible to public all the hours. This only can make the research accessible to the society, bring them into application and there by prove its worth. This only will put the work of a university into test and will ultimately ensure the quality and relevance of research. Without this the expenditure on research from public fund cannot be justified.

The OA Archives of its doctoral dissertations launched by Mahatma Gandhi University makes results of its last 25 years work accessible and useful to the public. The knowledge generated in the university is now available for application and testing in real life situations. The feedback that is non-existent in the past can now be used for improving the quality and relevance of research work going on in the university. The project is a challenge to other universities. It is an eye opener to costly and time-consuming ICT projects that never give results in India.

Centuries back the famous Indian Poet Bhartrihari stated that 'knowledge is a source that grows with sharing and decays by not sharing'. Through this Open Access Digital Archives let MG University be a model for other universities to make their knowledge open and alive.

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