Exploring the Intersection of Electronic Theses and Dissertations (ETDs) and Open Science in the 21st Century Library Science Landscape through Analysis of OATD.org

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Abstract

Purpose: This study aims to explore the intersection of Electronic Theses and Dissertations (ETDs) with Open Science in the realm of 21st-century library science. The purpose is to uncover the evolving landscape of ETDs and their implications within the context of Open Science. The research problem revolves around understanding how ETDs can benefit from Open Science principles, contributing to effective information management and knowledge dissemination.

Methods: To achieve this, a comprehensive analysis of the Open Access Theses and Dissertations (OATD) repository was conducted. A total of 2,683 ETDs from 2000 to 2023 were analyzed, revealing key trends and patterns. The research investigated ETD contributions across years, countries, universities, departments, and degree types.

Findings: The 'study's findings indicate that the years 2004-2008 were highly productive (32.91%), with Sweden being the primary contributor (38.84%). Notably, the University of Borås emerged as the top contributor among universities (21.36%), and the "Swedish School of Library and Information Science" stood out as the leading department (21.32%). Doctoral ETDs held the majority (23.85%), with PhD degrees predominating (20.16%). In terms of language, 38.02% of these ETDs were in "Swedish".

Implication: The study's implications are noteworthy as they underscore the importance of Electronic Theses and Dissertations (ETDs) in the dissemination of knowledge and the promotion of transparent and collaborative scholarly ecosystems. When ETDs align with the principles of Open Science, they have the potential to significantly increase the visibility of research. The study also presents strategies to improve the discoverability and utilization of ETDs, addressing copyright and data management challenges. Furthermore, it provides valuable insights for shaping the future of ETDs within the context of Open Science.

Keywords: Electronic Theses and Dissertations (ETD), Knowledge Dissemination, Library Science, OATD.org, Open Science, Scholarly Communication

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1. Introduction

Advancements in ICTs and open access have transformed scholarly communication, making research more accessible and fostering collaboration. Electronic Theses and Dissertations (ETDs) play a vital role in this landscape, offering valuable insights and contributing to academic growth. The adoption of electronic formats for the submission of theses and dissertations has greatly increased access to the knowledge they contain. National and international ETDs and databases provide users with valuable resources to explore (Sivakumaren & Thangavel, 2021). The ETD program provides guidelines, standards, and software to streamline processes and automate functions, ensuring the accessibility and long-term preservation of these works (Haneefa K & P., 2018).

Electronic Theses and Dissertations (ETDs) stand as invaluable assets within the realm of library science, encapsulating extensive research endeavors and presenting a wide array of topics and unique perspectives. Their convergence with the principles of Open Science bears great significance for the library science community, facilitating researchers in navigating existing knowledge and delving into the latest advancements. This paper delves into the intricate relationship between ETDs and Open Science within the domain of library science, meticulously examining the evolving landscape of these resources and their profound implications for effective information management. The study rigorously explores the strategies and challenges involved in amplifying the outreach and influence of ETDs, thus contributing substantially to the ongoing discourse regarding the transformative potential of Open Science in this field. Moreover, the research endeavors to analyze the contemporary Library Science landscape of the 21st century by examining ETDs available on the OATD.org platform, meticulously scrutinizing diverse parameters and offering valuable insights into the prevailing trends, challenges, and prospects entwining ETDs and Open Science in the library science sphere.

2. Literature Review

The literature review encompasses ten significant studies, offering a comprehensive understanding of the development, significance, challenges, and prospects of Electronic Theses and Dissertations (ETDs) in various contexts:

Lamba (2018) focused on applying topic modeling and prediction modeling to Indian ETDs in the field of Library and Information Science. Through topic modeling, her study suggested topics (tags) based on full-text analysis, enhancing information retrieval speed. It introduced a prediction model to classify forthcoming ETDs, bolstering organizational efficiency. Chakravarty (2019) discussed INFLIBNET's initiative, Shodhganga, for its role in aggregating theses and dissertations. With over 166,000 ETDs, it emerged as a substantial digital library. The study highlighted Shodhganga's significance, features, and evaluation, contributing to discussions on digital repositories. Dotson (2019) analyzed download rates of freely accessible theses and dissertations from the Ohio State University, exploring usage patterns and 'departments' achievements. The study examined ETDs accessibility and relevance within a specific university context.

Lamba and Margam (2019) employed topic mining and prediction modeling on ETDs from the PQDT Global database. Core topics were identified using Latent Dirichlet Allocation (LDA), and a prediction model was established for classifying untagged ETDs, contributing to classification and prediction techniques.

Rasuli et al. (2019) identified Critical Success Factors (CSFs) for ETD programs and organized them into a framework comprising dimensions like management, participation, content, technology, and service. This work aids in strategic decision-making for ETD program development and enhancement. The evaluation of Open Access Electronic Thesis and Dissertation (OAETD) repositories provided a comprehensive analysis of their structure, content support, and technical feasibility. The study by Wani (2019) offered insights into the progress of open access initiatives and suggested improvements for repository management and hosting.Ullah and Mirza (2020) examined the emergence of ETD repositories in university libraries of Islamabad Capital Territory and Rawalpindi, Pakistan. It emphasized the benefits of ETD repositories while identifying hindrances like lack of incentives and policies. The study underscored the need for support from university authorities to facilitate ETD repository development. Chetia (2021) explored the integration of theses and dissertations into the Shodhganga-INFLIBNET repository. This study highlighted the impact of such initiatives on academic communities. Analyzing the involvement of top-ranked Indian universities, the study showcased the substantial contribution of ETDs in Library and Information Science to the repository. Sivakumaren and Thangavel (2021) assessed the availability of Open Access Electronic Thesis and Dissertation (OATD) resources in the Library and Information Science field. The study revealed the contributions of various countries, universities, and institutions to OATD.org. It emphasized the prevalence of English and the influence of specific institutions in shaping the repository's content. Rahman and Perera (2022) investigated ETD initiatives in Sri Lanka and Bangladesh. The study highlighted the growth of ETD repositories and their importance in sharing research data. It emphasized the role of ETDs in fostering research culture, particularly within the scholarly communities of developing countries. The study also discussed the usage of open-source technologies and university-generated ETD collections in ETD repository development.

Overall, the reviewed literature provides valuable insights into the evolving landscape of ETDs and their role within the realm of academic research and information dissemination.

3. Study Objectives

The primary objectives of this study are to:

i) Provide an overview of Electronic Theses and Dissertations (ETDs) by examining their importance in the field of library science.

ii) Explore the concept of Open Science in Library Science, highlighting its values and principles, relevance and potential benefits for ETDs.

iii) Conduct a comprehensive analysis of OATD.org, a prominent repository for ETDs, to examine the trends, characteristics, and contributions of ETDs in the field of Library Science over the selected time frame.

iv) Identify and discuss the challenges and future directions for ETDs in the context of Open Science.

4. Electronic Theses and Dissertations (ETDs): An Overview

ETDs are significant in modern scholarly communication, evolving from traditional print versions to multimedia-enriched, accessible digital formats. Initially aimed at streamlining submission and access, ETDs now play a crucial role in widespread research dissemination and collaboration.

Electronic theses and dissertations, or ETDs, can be defined those submitted, archived, or accessed in electronic formats (NDLTD Team, 1997). Weisser and Walker (1997) further added that ETDs “”includes traditional word-processed (or typewritten and scanned) documents made available in Print Document Format (PDF), as well as less-traditional hypertext and multimedia formats published electronically on CD-ROM or the World Wide Web”.”

Barua (2006) defined ETDs as “”electronic versions of traditional theses and dissertations explaining research and scholarship of students and which is capable of distribution through telecommunication networks to a global user”.”

4.1. Importance of ETDs in the Library Science Landscape

The significance of Electronic Theses and Dissertations (ETDs) in the realm of library science is underscored by several key factors:

i) Repository of Knowledge: ETDs represent a repository of intellectual endeavours within library science. They encapsulate original research, innovative methodologies, and valuable insights, contributing to the continuous growth of knowledge within the field.

ii) Resource for Future Research: ETDs serve as valuable resources for future researchers, providing a foundation for building upon existing studies. They offer insights into the evolution of research trends, enabling scholars to identify gaps and opportunities for further investigation.

iii) Professional Development: ETDs support the professional development of librarians and information professionals. They provide access to diverse perspectives, methodologies, and best practices, fostering continuous learning and skill enhancement.

iv) Global Accessibility: The digital format of ETDs enables global access, transcending geographical boundaries. This accessibility fosters international collaboration, allowing researchers to engage with various perspectives and experiences.

v) **Interdisciplinary Insights:** ETDs often explore interdisciplinary topics, offering insights beyond traditional disciplinary boundaries. This interdisciplinary nature enriches the library science landscape and promotes cross-disciplinary dialogue.

vi) **Informed Decision-Making:** ETDs offer evidence-based insights that can inform decision-making processes within library science institutions. These studies can guide the development of policies, services, and strategies.

vii) **Advancing Innovation:** ETDs frequently showcase innovative approaches to addressing challenges within the field. They provide a platform for presenting novel ideas and experimental projects, driving the innovation agenda in library science.

viii) **Enhancing Visibility:** ETDs enhance the visibility of research conducted within the library science domain. This increased visibility contributes to the recognition of the field's importance and impact within the larger academic community.

ix) **Preservation of Knowledge:** The digitization of theses and dissertations ensures the long-term preservation of scholarly work. This preservation safeguards valuable research for future generations of scholars and practitioners.

x) **Contributing to Open Science:** ETDs align with the principles of Open Science by enabling open access to research outputs. They promote transparency, collaboration, and knowledge sharing, aligning with the broader goals of the open science movement.

5. Open Science in Library Science: Concept and Relevance

Open Science represents a transformative approach to scholarly research characterized by transparency, collaboration, and the unrestricted sharing of research outputs. At its core, Open Science seeks to make research findings, data, methodologies, and even software openly accessible to the global research community and the public. This approach fosters innovation, accelerates scientific progress, and enhances the reliability of research outcomes.

Researcher Jeff Rouder (2017) defined Open Science as "endeavouring to preserve the rights of others to reach independent conclusions about your data and work".

According to Dallmeier-Tiessen and Šimko (2019), CERN affirms that Open Science encompasses all aspects of how scientific research is governed, performed, shared, published, and evaluated. It demands more than simply making data available: it needs to provide information on how to repeat or verify an analysis performed.

Further, Open Science in the UNESCO Recommendation (2021), "is a set of principles and practices that aim to make scientific research from all fields accessible to everyone for the benefit of scientists and society as a whole. The recommendation aims to ensure not only that scientific knowledge is accessible but also that the production of that knowledge itself is inclusive, equitable and sustainable".

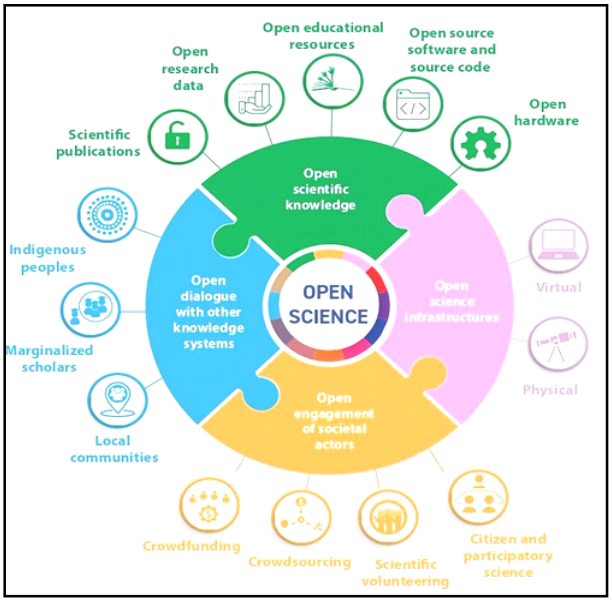

Figure 1: Pillars of the Open Science (UNESCO, 2021)

5.1. Values and principles of Open Science

The UNESCO Open Science Recommendation establishes a global structure for open science policies and implementation to bridge technological and knowledge gaps among and within nations. This directive presents a common definition and shared values, principles and standards for international open science endeavors. Furthermore, it suggests measures to promote an impartial and open science environment encompassing individuals, institutions, nations, regions, and the international community (UNESCO, 2023).

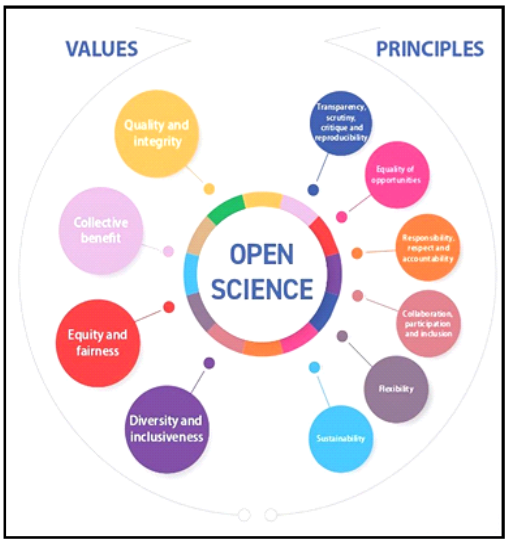

Figure 2: Values and Guiding Principles of Open Access (UNESCO, 2021)

5.1.1. Values

i) **Quality and integrity:** ensuring that science is high-quality and scrutinized by bringing together different sources of knowledge and making evaluation of scientific methods and outputs more transparent and accurate.

ii) **Collective benefit:** recognizing that science is a global public good that belongs to all humanity.

iii) **Equity and fairness:** ensuring equitable, fair and reciprocal access to science for all producers and consumers of knowledge regardless of their location, nationality, race, age, gender, income, socio-economic circumstance, career stage, discipline, language, religion, disability, ethnicity, migratory status or any other grounds.

iv) **Diversity and inclusiveness:** embracing diversity of knowledge, practices, workflows, languages and research topics and outputs.

5.1.2. Guiding principles

An agreed set of principles helps Member States uphold these values and make open science a reality.

i) **Transparency, scrutiny, critique and reproducibility:** to reinforce the rigor of scientific results, enhance the positive impact of science on society and increase 'society's ability to solve complex interconnected problems.

ii) **Equality of opportunities:** to ensure that all scientists and those with an interest in science have equal opportunity to access, contribute to and benefit from science, regardless of origin or circumstance.

iii) **Responsibility, respect and accountability:** to be responsible for and aware of public accountability, potential conflicts of interest, intellectual integrity and the possible social or ecological consequences of research activities.

iv) **Collaboration, participation and inclusion:** to ensure that scientific collaborations transcend the boundaries of geography, language and resources and include knowledge from marginalized communities to solve problems of great social importance.

v) **Flexibility:** acknowledging that there is no one-size-fits-all way to practice open science and encouraging different pathways to it while upholding the core values.

vi) **Sustainability:** to be as efficient and impactful as possible by building on long-term practices, services, infrastructures and funding models to ensure participation of scientists from less-privileged countries or institutions.

5.2. Integration of Open Science practices in library science

In the realm of library science, the principles of Open Science align seamlessly with the 'field's ethos of information accessibility and sharing. By integrating Open Science practices, library science professionals can contribute to the advancement of the discipline while enhancing the dissemination of knowledge. Open access to research findings, resources, and educational materials can significantly benefit library professionals, educators, students, and the wider community.

5.3. Potential benefits and challenges of Open Science in ETDs

5.3.1. Benefits

- **Increased Visibility and Impact:** Openly accessible ETDs can reach a broader audience, leading to increased visibility and potential collaborations.
- **Knowledge Sharing:** ETDs aligned with Open Science principles contribute to the broader dissemination of research findings, enriching the academic landscape.
- **Innovation and Collaboration:** Open access to ETDs encourages interdisciplinary collaboration and innovation, fostering cross-disciplinary dialogues.
- **Public Engagement:** Openly available ETDs engage the public, enabling non-academic stakeholders to access valuable research insights.

5.3.2. Challenges

- **Quality Control:** Open access may raise concerns about the quality and validity of research. Effective peer review and validation mechanisms are essential.
- **Data Privacy:** Open access to ETDs could potentially compromise sensitive data. Strategies for anonymization and data protection need to be implemented.
- **Sustainability:** Maintaining open access repositories requires sustainable funding models to ensure the long-term accessibility of ETDs.
- **Intellectual Property:** Balancing open access with intellectual property rights and authorship recognition requires careful consideration.

6. OATD.org: A Comprehensive Analysis

6.1. Overview and Significance

Open Access Theses and Dissertations (OATD.org) holds a pivotal role as a global repository for scholarly theses and dissertations. With over 6.6 million indexed works sourced from 1100 academic and research institutions worldwide (OATD.org, n.d.), OATD.org stands as a premier resource for open access research. Its alignment with Open Science principles promotes transparency and knowledge sharing. OATD.org

uncovers valuable insights through comprehensive analysis, enhancing our understanding of scholarly trends and contributions across fields like Library Science.

An in-depth and thorough analysis of OATD.org will be undertaken in the following sections. This analysis aims to scrutinize the trends, attributes, and contributions of ETDs within the domain of Library Science during the 21st century.

6.2. Research Methodology

For the analytical part of this study, data was collected from the OATD.org database, available at https://oatd.org/, on June 12, 2023. The search term used to select the sample and collect the data was: (subject:(Library AND Science) AND pub_dt:[2001-01-01T00:00:00Z TO *]). A total of 2683 ETDs resulted from this search and were selected as the primary sample for the study. The primary data was initially collected in MS Excel and subsequently analyzed using various parameters, including growth trends, country-wise and university-wise contributions, department-wise contributions, levels of ETDs, degrees awarded, and languages used in the ETDs. In this study, the percentage method was employed to analyze the data in relation to the total universal set (N).

6.3. Data Analysis and Findings

6.3.1. Year-wise Contribution of ETDs

The Open Access Theses and Dissertations (OATD) repository is a digital collection of Theses and Dissertations. From the year 2000 to 2023, a total of 2,683 ETDs focused on “Library Science” have been contributed to OATD.org. These ETDs were categorized into five groups based on their respective years.

Table 1: Year-wise Contribution of ETDs

Sr. No.	Range (Year)	Quantity	Percentage	Rank
1	2000-2003	211	7.86%	5
2	2004-2008	883	32.91%	1
3	2009-2013	669	24.94%	2
4	2014-2018	631	23.52%	3
5	2019-2023	289	10.77%	4
Total	2683	100.00%	-	

Table 1 showcases the distribution of ETD contributions in OATD.org over time. The period from 2004-2008 exhibited the highest number of Theses and Dissertations, accounting for 32.91% of the total. This was followed by contributions during 2009-2013 and 2014-2018, representing 24.94% and 23.52% of the ETDs, respectively and the period 2019-2023 encompassed 10.77% of the contributions, while the earliest years from 2000-2003 comprised 7.86% of the total.

6.3.2 Country-wise Contribution of ETDs

Previously, researchers faced challenges in accessing and staying updated with ongoing and completed studies in their field of interest, leading to potential research duplication. However, in the modern era, advancements in Information and Communication Technologies (ICTs) and the availability of numerous open databases for theses, dissertations, and research reports have revolutionized the research landscape. Researchers can now access and follow studies from their own country and research from around the world.

Table 2: Country-wise Contributions of ETDs

Rank	Country	Quantity	Percentage(N=2683)
1	Sweden	1042	38.84%
2	US	851	31.72%
3	India	160	5.96%
4	UK	130	4.84%
5	South Africa	111	4.14%

Table 2 presents the contributions of ETDs from the top five countries in OATD.org. Out of the total 2,683 ETDs, Sweden accounted for the highest contributions (38.84%) among all countries. The United States followed closely with the second-highest contribution (31.72%), while India (5.96%), the United Kingdom (4.84%), and South Africa (4.14%) also made significant contributions. Contributions from other countries were relatively lower in comparison.

6.3.3 University-wise Contribution of ETDs

Universities are critical in education, offering diverse programs, including research. These contribute research output, which is presented as theses and dissertations. Initiatives have arisen to streamline content processing and dissemination.

Table 3: University-wise Contribution of ETDs

Rank	University	Quantity	Percentage(N=2683)
1	University of Borås	573	21.36%
2	Uppsala University	413	15.39%
3	University of Michigan	110	4.10%
4	Florida State University	89	3.31%
5	University of KwaZulu-Natal	84	3.13%

Table 3 highlights the contributions of the top five universities in the field of Library Science within the selected timeframe of this research. The “University of Borås” leads the pack, contributing 21.36% of the

ETDs in this field. In the second position is "Uppsala University" with a contribution of 15.39%. Noteworthy contributions also come from "University of Michigan" (4.10%), "Florida State University" (3.31%), and "University of KwaZulu-Natal" (3.13%).

6.3.4 Department-wise Contribution of ETDs by Departments

Table 4 displays the top 5 contributed departments in OATD.org. It is evident from the table that there were some inconsistencies in filling out the department names during the upload of the theses and dissertations. Among the five departments, the "Swedish School of Library and Information Science" emerges as the top contributor with a contribution of 21.32%, followed by the department labeled as "ALM" with 15.39% contributions.

Table 4: Department-wise Contribution of ETDs

Rank	Departments	Quantity	Percentage(N=2683)
1	Swedish School of Library and Information Science	572	21.32%
2	ALM	413	15.39%
3	Library and Information Science	130	4.85%
4	Information	99	3.69%
5	Library and information science	87	3.24%

6.3.5 Level of ETDs

During the selected period of this study in OATD.org, ETDs in the field of Library Science were categorized into three types: Doctoral, Masters, and Thesis. Table 5 highlights that Doctoral level ETDs hold the highest position with a contribution of 23.85%, followed by Masters level ETDs with 7.72% contribution, and Thesis with 3.17% contribution.

Table 5: Level of ETDs

Rank	Levels	Quantity	Percentage(N=2683)
1	Doctoral	640	23.85%
2	Masters	207	7.72%
3	Thesis	85	3.17%

6.3.6 Degrees Awarded

Table 6 illustrates the distribution of degree types awarded for the ETDs available in OATD.org. Among the analyzed ETDs, PhD degrees accounted for the highest contribution at 20.16%. Other degree types included MS degrees, awarded for 3.65% of the ETDs, and M.I.S. degrees, awarded for 1.30% of the ETDs, among others.

Table 6: Degrees Awarded

Rank	Degrees	Quantity	Percentage(N=2683)
1	PhD	541	20.16%
2	MS	98	3.65%
3	M.I.S.	35	1.30%
4	MA	28	1.04%
5	EdD	13	0.48%

6.3.7 Languages of the ETDs

The language in which content is written influences its usage. The availability of content in a widely understood language (e.g. English) at the international level tends to increase its usage.

Table 7: Languages of the ETDs

Rank	Language	Quantity	Percentage(N=2683)
1	Swedish	1020	38.02%
2	English	925	34.48%
3	Portuguese	47	1.75%
4	English New Zealand (nz_en)	34	1.27%
5	Spanish	30	1.12%

Table 7 indicates that “Swedish” is the dominant language, with the highest number of ETDs (38.02%) contributed to OATD.org. “English” follows closely as the second most utilized language, accounting for 34.48% of the ETDs in the database.

7. Challenges and Future Directions

7.1. Addressing legal and ethical considerations

The growth of Electronic Theses and Dissertations (ETDs) introduces intricate legal and ethical dimensions that require careful consideration:

i) **Copyright and Intellectual Property:** ETDs, as digital scholarly works, must adhere to copyright regulations and intellectual property rights. Balancing open access with ‘creators’ rights demands thoughtful navigation. Clarity on how copyrighted content is used, cited, and shared is essential.

ii) **Data Protection and Privacy:** ETD repositories involve the collection and dissemination of personal data. Complying with data protection laws and ensuring ‘authors’ privacy is crucial. Stricter regulations,

like the General Data Protection Regulation (GDPR), necessitate robust measures to safeguard sensitive information.

iii) **Authorship and Attribution:** Assigning accurate authorship and proper attribution is fundamental. Issues related to multiple authors, collaborative research, and ensuring authorship integrity must be resolved transparently.

iv) **Access Control:** Open access raises questions about controlling access to sensitive or embargoed content. Balancing unrestricted access with protecting sensitive information or works undergoing patent applications poses a challenge.

v) **Ethical Use of Data:** Ethical considerations extend to data usage within ETDs. Ensuring that research involving human subjects or sensitive data conforms to ethical guidelines and principles.

vi) **Repository Management:** Repository managers must uphold ethical practices regarding content selection, metadata accuracy, and preserving the integrity of ETDs. Guidelines for ethical repository management are essential.

7.2. Overcoming technical and infrastructural challenges

The successful operation of ETD repositories hinges on addressing complex technical and infrastructural challenges:

i) **Scalable Infrastructure:** The exponential growth of ETDs requires infrastructure that can handle vast volumes of data without compromising performance. Scalability ensures repositories remain responsive, even as the content accumulates.

ii) **Sustainability:** Sustainable long-term archiving is a priority. Maintenance strategies should encompass not only storage but also data migration, format preservation, and disaster recovery plans to ensure the accessibility of ETDs over time.

iii) **Metadata Accuracy:** Metadata accuracy is crucial for effective discovery and access. Ensuring consistent, accurate, and standardized metadata across diverse ETDs demands technical solutions that automate metadata management.

iv) **Interoperability:** ETD repositories often operate independently, leading to fragmentation. Developing interoperability protocols ensures seamless communication between repositories, allowing users to navigate and access content across different platforms effortlessly.

v) **Search Mechanisms:** Efficient and user-friendly search mechanisms are paramount. Implementing advanced search functionalities, natural language processing, and semantic indexing enhances the discoverability of ETDs.

vi) **Multimedia and Complex Content:** Incorporating multimedia elements and complex data structures within ETDs presents technical challenges. Ensuring that diverse content formats are supported and displayed accurately requires adaptable infrastructure.

vii) **User Experience:** Enhancing the user experience is an ongoing pursuit. User-friendly interfaces, responsive design, and accessibility features ensure a positive interaction between users and ETD repositories.

7.3. Exploring emerging trends and possibilities

The realm of Electronic Theses and Dissertations (ETDs) is poised for dynamic transformation through emerging trends and possibilities:

i) **Multimedia Integration:** The incorporation of multimedia elements like videos, interactive simulations, and data visualizations can enrich ETDs, enhancing their accessibility and engagement for a broader audience.

ii) **Artificial Intelligence (AI) and Machine Learning:** Leveraging AI and machine learning technologies can revolutionize ETD discovery. These technologies can facilitate sophisticated metadata tagging, intelligent content recommendation systems, and automated content summarization.

iii) **Blockchain Technology:** Blockchain's secure, decentralized architecture offers the potential for authentication and tracking of ETDs' origins, revisions, and ownership. This technology ensures data integrity and could enhance the credibility of ETDs.

iv) **Extended Open Science Principles:** ETDs can embrace Open Science principles beyond accessibility. Collaborative authoring, transparent peer review, and post-publication peer review can contribute to a more open and dynamic scholarly environment.

v) **Integration with Scholarly Communication Networks:** Integrating ETDs into broader scholarly communication networks fosters interdisciplinary collaboration. It might lead to new citation metrics, alternative impact indicators, and innovative ways of assessing scholarly contributions.

vi) **Global Collaboration:** Exploring these trends requires collaborative efforts across multiple stakeholders. Researchers, institutions, publishers, and policymakers must work collectively to shape the trajectory of ETDs within the evolving landscape of Open Science.

8. Conclusion

Electronic Theses and Dissertations (ETDs) stand as invaluable resources that encapsulate rigorous research efforts, catering to the needs of researchers, educators, and practitioners alike. Their role as knowledge repositories is pivotal, contributing to the enrichment of scholarly discourse and intellectual growth. The current study delved into the OATD repository, revealing insights on ETDs in the 21st century Library

Science. The findings not only elucidate ETD distribution and global contributions but also underscore 'ETDs' value in knowledge dissemination, fostering a scholarly ecosystem that thrives on accessibility, transparency, and shared insights.

For the Library Science community, this study underscores the importance of understanding and embracing ETDs as essential contributors to the scholarly ecosystem. ETDs offer unique perspectives, diverse methodologies, and comprehensive literature reviews, shaping the field's advancement. Their integration with Open Science principles amplifies their impact, fostering a culture of open collaboration and accelerating research innovation. Stakeholders within the ETD landscape, including researchers, institutions, and repository managers, must recognize the legal, ethical, technical, and infrastructural challenges that accompany ETD proliferation. Addressing these challenges will ensure the seamless dissemination and preservation of valuable research.

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