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Evaluation of Online Learning Repositories: A Comparative Study

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ABSTRACT

Many online learning repositories available around the world. This paper provides a comparative analysis among selected online learning repositories (eGyankosh, ePG pathshala, MIT resources and Sodhganga) for learning resources. The comparative study is based on some analytical parameters, like generic, content related, retrieval related, post processing, interface related, etc. The collected data have been analysed on the basis of parameters. The results have been displayed through different types of diagrams like multiple bar diagrams, pie diagram, etc. It was found that none of the selected online learning repositories achieved the full score. And also found that Sodhganga ranked the highest position among them.

Keywords: Online learning repositories; Electronic information; Digital reference sources; Information explosion

1. INTRODUCTION

There are various types of online learning resources available on the Internet. Use of electronic information has increased with the rapid advancement of internet and its related technologies. Now internet is an effective communication medium enabling collaboration and interaction between individuals and their computers regardless of their geographical barrier. The development of the world wide web has led to tremendous growth in the quantity of all types of publications. Presently the web is a reliable and effective mechanism for dissemination of information. The web has surrounded a variety of information resources, such as, electronic journals (e-journals), educational materials, technical reports, library catalogues (OPAC), databases, career sources, information on organisations, associations and many more[1].

To keep pace with the rapid growth of information, libraries are re-innovating themselves. They must provide well equipped environment for information seekers with many options, time saving by use of different types of Information and communication technology. While most of the libraries are trying to publish their digital resources on web very fast, they are also taking steps to make their online learning repositories and reference services available digitally. Few digital reference services incorporate e-mails, instant messaging (online chat), and telephone have been in use for decades, while other services such as text messaging and video conferencing are emerged in the last decade[2].

Digital reference service is considered as an online reference service for library patrons to query reference information on library's website. Unlike traditional reference, digital reference service allows patrons to submit questions and receive answer via the internet or other electronic means[3]. Therefore, the digital reference sources should be strong in nature to render services to the tech-savvy users.

Online learning repositories are one of the method of digital reference sources for learning resources. Some of major online learning repositories studied here are eGyankosh, JISC resources, MIT resources, CEC UGC resources ePG Pathshala, Sodhganga[4].

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2. LITERATURE REVIEW

Singh[5] studied the comparative digital reference services of north Indian academic libraries. The various models of providing digital reference services such as email, "Ask questions", video conferencing, digital robots, online chat reference and collaborative digital reference were discussed in his research. He also discussed the strength and weakness of existing reference service being provided by the university libraries. To complete the research he used the observation method of study to explore the websites of the above universities. An evaluation criteria was used to collect the relevant data and the collected data were tabulated, analysed and interpreted to compare the present digital reference service of the above selected universities.

Kumah[6] compared the use of Internet and library of graduate students in the University of Ghana. A convenient sampling technique was used to select the sample for the study. 93.3 per cent of the respondents answered positive regarding their use of library; 98.8 per cent of the respondents use Internet; and lastly Other source of information used by the graduate students which includes media, interaction with experts, etc. It was found in his study that 72 per cent of the

respondents use Internet and library. He recommended in his study that the library should be upgraded to meet requirements of the users.

Akor & Alhassan[1] discussed the evaluation of reference services in academic libraries in Nigeria. The research reflected about the questions about available reference service which includes answering reference queries, digital reference service, referral service; extent of providing reference service which includes provision for reference materials, provision for thesis and dissertation, provision for photocopying; adequacy of reference service which includes reference sources such as encyclopedia, dictionaries, manuals, maps, etc. and finally users perceptions about reference service which includes helps to users, information retrieval aids, provide right information at the right time, satisfaction of information needs. He also recommended for the library users in keeping of adequate reference materials, continuous training of reference librarians, Student awareness service, provision of current awareness services and selective dissemination of information (SDI).

Farmer[8] has found that reference sources are two types, i.e., print format and electronic format. Both the formats are complement with each other. Now the print format becomes costlier than electronic format. Though the electronic resources have some limitations regarding the connectivity and other infrastructure issues, privacy and security, access and dissemination rights, vendor problem, etc. He discussed in his research, the selection process and polices of digital reference sources which includes scope, arrangement, ease of use, purpose, audience and authority. He also mentioned some additional criteria for the selection of reference source which includes interface, readability, file transferability, technical requirements and licensing agreements. In the life cycle of electronic resource management part, he explained about pre-planning, acquisition, licensing, web presentation, usage, maintenance, preservation and archiving and review of digital reference source.

2.1 eGyankosh

eGyankosh is a National Digital Repository. In October 2005, Indira Gandhi National Open University (IGNOU) initiated the development of a knowledge repository of online learning resources for storing, indexing, preserving, disseminating and sharing the digital learning resources developed by the open and distance learning (ODL) institutions in the country (India). At present, e-learning is more advanced and dynamic concepts of social networking, personal learning environments and mobile learning rather than a content repository and emulating classroom teaching by using ICT applications. It is an online learning environment for distance learners[9].

2.2 e-PG Pathshala

In September, 2011, The Ministry of Human Resource Development (MHRD), Government of India has started a valuable project, National Mission on Education through Information and Communication Technology (NME-ICT) to initiate and to accelerate the ICT – enabled Higher education[10].

Primarily, NME-ICT has Sanction to produce of e-content in 77 subjects for postgraduate level. It was proposed to create and maintain the e-contents with high quality based on curriculum and syllabus interactively in various subjects in all disciplines like natural & mathematical sciences, social sciences, arts, fine arts & humanities, and linguistics and languages. The developed e-contents are available in open access and also accessible through Sakshat Portal .

2.3 MIT RESOURCES

In April 2001, Massachusetts Institute of Technology (MIT) initiated a project named "MIT Open Course Ware (MIT OCW)" to publish MIT course materials on web. 3369 Courses were published by Massachusetts Institute of Technology (MIT) till Nov. 2017. In 2005. Open Course Ware Consortium was started with aim to access the course materials over Internet and to develop online system for the publication of open course materials. The MIT OpenCourse Ware was funded and suppoted by the William and Flora Hewlett Foundation, the Andrew W. Mellon Foundation, and MIT[11].

2.4 Shodhganga

The Shodhganga is project, initiated by Information and Library Network (INFLIBNET) center, Ahmedabad. It is a digital institutional repository containing of theses and dissertations from Indian Universities. In June 2009, the University Grants Commission (UGC) has made a mandatory regulations for all universities to submit soft copies of PhD theses and MPhil dissertations to the UGC for hosting in the INFLIBNET (Information and Library Network). The 357 universities and 14 Centrally Funded Technical Institutes (CFTI) in India are taken membership through MoUs with the INFLIBNET Centre to participate in the Shodhganga project[12]. The Shodhganga@INFLIBNET is set-up and implemented by using free and open source software called Dspace (http://www.dspace.org). According to the notification of the UGC, it is mandatory that every researcher of all Indian universities have to submit the soft copy/e-version of their theses and dissertations for availability as open access to Indian theses and dissertations to the academic community world-wide.

3. OBJECTIVES OF THE STUDY

For evaluating online learning repositories, followings parameters formed the objectives of this research study:

- Generic parameters
- Content related parameters
- Retrieval related parameters
- Post processing parameters
- Interface related parameters

4. METHODOLOGY

The "evaluation parameters" as emphasised in the lecture note[13] and was framed questionnaire. Then fill it carefully to fulfill the study. The responses received for the questions with 72 features in 05 major categories carried out each time a question is checked (marked as 1) and one point is assigned to the evaluation of digital reference source concern. Thus the study was reached to its conclusion.

4.1 Analysis and Interpretation

Table 1 reveals the availability of online learning repositories

Generic parameters for evaluation of any online learning repositories are the most valuable criteria. The Table 2 narrates the generic parameters. This parameter includes scope and coverage, vendor/publisher viability, frequency of update, distribution policy, authentication of primary sources, availability of local subscription agent, copyright and other legal issues, facility of replacement, hardware and software compatibility, data access speed and cost of data base.

From the Table 2, it is shown ePG Pathshala, MIT resources and Sodhganga scored equal (maximum), i.e. 07 and eGyankosh scored lowest, i.e. 05 out of 11.

Content is always the key factor of any online learning repositories. This parameter focuses the following Table 3 reveals the content related parameter. This parameter focuses on extent of coverage, coverage of time span, completeness of individual records, use of standard encoding formats, use of standard record structure and application of standard tools in information organisation.

Table 3 shows that maximum score 06 was achieved by Sodhganga where as minimum score 04 was achieved by eGyankosh, ePG Pathshala and MIT resources each in this category.

Retrieval of information is most important thing for the evaluation of online learning repositories. The Table 4 reveals retrieval related parameters. This parameter includes index related factors such as -browse index, number of posting, cross-reference and thesaurus (integrated); search structure related factor such as - item selection form index, term selection from record, case sensitivity, search types and combine search facility; search features such as - availability of boolean operator, availability of relational operator, positional search operator and truncation facility, truncation facility, proximity operators, range search, field level search, and use of fuzzy

Table 1. Informative data of four online learning resources

Repository	Year of origin	URL	Country (HQ)
MIT Resources	2001	https://ocw.mit.edu	Massachusetts, USA
eGyankosh	2005	http://www.egyankosh.ac.in	Delhi, India
Sodhganga	2009	http://shodhganga.inflibnet.ac.in	Gujrat, India
ePG Pathshala	2011	http://epgp.inflibnet.ac.in	Gujrat, India

Table 2. Generic parameters of four database (information available = 1 and information not available = 0)

Parameters	eGyankosh	ePG pathshala	MIT Resources	Sodhganga
Scope & Coverage	Includes course materials for under graduate and Post Graduate and covers 220 programmes including MPHIL and Doctoral Degree	Course materials for Post Graduate of 77 subject	Undergraduate of 3369 course material	Thesis and Dissertation from India
Vendor / Publisher viability	NA	List of vedors are available in the web portal	MIT	INFLIBNET
Frequency of update	After 2008 it was last updated Mar. 2016	Last updated in Mar. 2014	Updated yearly	Updated
Distribution policy	NA	NA	NA	NA
Authentication of primary sources	Authentic	Authentic	Authentic	Authentic
Availability of local subscription agent	NA	NA	NA	NA
Copyright and other legal issues	All rights reserved to IGNOU	All rights reserved to INFLIBNET	All rights reserved to MIT	All rights reserved to INFLIBNET
Facility of replacement	NA	NA	NA	
Hardware and software compatibility	NA	Sakshat Portal	Plone based software is used	DSpace software used
Data access speed	NA	NA	NA	NA
Cost of data base	Free	Free	Free	Free
Score (Maximum 11) :	05	07	07	07

Table 3. Content related parameters of four database

Parameters	eGyankosh	ePG Pathshala	MIT resources	Sodhganga
Extent of coverage	1	1	1	1
Coverage of time span	1	1	1	1
Completeness of individual records	0	0	0	1
Use of standard encoding formats	0	0	0	1
Use of standard record structure	1	1	1	1
Application of standard tools in information organization	1	1	1	1
Score (Maximum 6) :	04	04	04	06

logic; search profile such as - speed of performance, facility of saved search, search status, search set management, availability of display formats, display control, search history display, search modification facility and Search statistics facility. Table 4 shows that maximum score was achieved by Sodhganga, i.e., 19 out of 26, followed by MIT resources and eGyankosh (13 out of 26) and ePG Pathshala scored the lowest, i.e., (7 out of 26).

The Table 5 reveals the post processing parameters. This parameter reflects downloading facility, printing facility, integration facility, facility to control number of fields in transfer and choice of data transfer format such as - simple text, CSV file, MARC / UNIMARC Format, ISO format and Export facility. In the Table 5 it is found that the maximum score 05 out of 09 achieved by Sodhganga where as MIT resources scored 03 out of 09 and eGyankosh and ePG Pataskala scored 04 each out of 09 in this category.

For evaluation of any online learning repositories database, Interface always plays a vital role. The next table, Table 6 narrates the interface related parameters. This parameter includes operational parameters such as input option (keyboard, mouse and others), facility to break search or processing, facility to use online thesaurus, saving of search profile for future use and option to exit/escape/abort; navigational parameters such as navigation between records, navigation within records, hyper based navigation outside the system or web, navigation in thesaurus or other vocabulary control device and Navigation through term dictionary; communication parameters such as standard terminology, screen layout, consistency in prompts, menus and help massages, novice and expert user interface, facility to change theme/appearance, multilingual option and consistency in use of terminology; support parameters such as online help, online tutorial, and appropriate error massage with instruction to solve access problems. From the Table 6**,** it is seen that Sodhganga scored the maximum 14, followed by eGyankosh, MIT resources and ePG Pathshala.

Table 7 contains the all parameters with its score values for the comparative statement of evaluation study. It shows that the Sodhganga has scored highest i.e. 51. eGyankosh has ranked second and MIT resources are in third position.

From the Table 8, displaying the total scores, scores obtained and the percentage of all different primary parameters of all databases. None of them has met the full scores. The parameter content related parameters has scored highest 18 out of 24 and got 75 per cent. The generic parameters has ranked 2nd position and the interface related parameters is at last position. It has been seen that the total maximum score is 288 of all parameters, i.e. generic parameters, content related parameters, retrieval related parameters, post processing parameters, interface related parameters. They have achieved only 148 scores i.e. 51.39 per cent.

Table 9 contains the fields like score obtained, total score, percentage of parameters and ranking of all online learning repositories. The 'total score' indicates the sum of all maximum scores of all parameters (generic parameters, content related parameters, retrieval related parameters, post processing parameters, interface related parameters) of each database. The 'Score Obtained' indicates the sum of obtained scores of all parameters. The Sodhganga database has achieved the highest score, i.e. 51 (70.83 %) and ranked first position. The eGyankosh, MIT Resources, and ePG Pathsala have got 36 (50 %), 34 (47.22 %), 27 (37.5 %), respectively. None of the online learning repositories achieved the maximum scores for parameters related to evaluation. The ranks clearly indicate the requirement of further development of repositories.

4.2 Suggestions and Recommendations

At the end of the study, it seems that following suggestions and recommendations may be incorporated for further development of online learning repository:

- The distribution policy is an important parameter for the evaluation of every learning repository, but every learning resource lacks distribution policy. So there should be a clear distribution policy for every repository;
- Each and every repository should have standard record structure and a standard encoding format;
- There should be combined search facility in case of every repository;
- There should be integration facility for every repository;
- There must be data transfer format;
- Navigation from one record to another is very much fruitful in time searching any information. There should be navigation facility in every repository;
- Online help, online tutorial and appropriate error massage must be there.

Table 4. Retrieval parameters of four database

Parameters	eGyankosh	ePG Pathshala	MIT Resources	Sodhganga
A. Index Related Factors				
Browse index	1	0	0	1
Number of posting	1	0	1	1
Cross-reference	0	0	1	0
Thesaurus (integrated)	0	0	0	0
Score (Maximum 4) :	02	00	02	02
B. Search structure related Factors				
Item selection form index	0	0	0	1
Term selection from record	1	1	0	1
Case sensitivity	0	0	1	0
Search types	0	0	1	1
Combine search facility	0	0	0	1
Score (Maximum 5) :	01	01	02	04
C. Search features				
Availability of Boolean operator	0	0	0	0
Availability of relational operator	0	0	0	0
Positional search operator	0	0	0	1
Truncation facility	0	0	1	1
Proximity operators	0	0	0	0
Range search	1	0	1	1
Field level search	1	1	1	1
Use of Fuzzy logic	0	0	1	1
Score (Maximum 8) :	02	01	04	05
D. Search Profile				
Speed of performance	1	0	0	0
Facility of saved search	1	1	0	1
Search status	1	1	1	1
Search set management	1	0	1	1
Availability of display formats	1	1	1	1
Display control	1	0	1	1
Search history display	0	1	0	1
Search modification facility	1	1	0	1
Search statistics facility	1	0	1	1
Score (Maximum 9) :	08	05	05	08
Total Score (Maximum 26) :	13	07	13	19

Table 5. Post processing parameters of four database

Parameters	eGyankosh	ePG Pathshala	MIT resources	Sodhganga
Downloading facility	1	1	1	1
Printing facility	1	1	1	1
Integration facility	0	0	0	1
Facility to control number of fields in transfer	0	0	0	0
Choice of data transfer format				
Simple text	1	1	1	1
CSV file	0	0	0	0
MARC / UNIMARC Format	0	0	0	0
ISO format	0	0	0	0
Export facility	1	1	0	1
Score (Maximum 9) :	04	04	03	05

Table 6. Interface parameters of four database

Parameters	eGyankosh	ePG Pathshala	MIT resources	Sodhganga
A. Operational parameters				
Input option (Keyboard, mouse, others)	1	1	1	1
Facility to break search or processing	0	0	0	1
Facility to use online thesaurus	0	0	0	0
Saving of search profile for future use	1	1	0	1
Option to exit / escape /abort	1	0	0	1
Score : (Maximum 5)	03	02	01	04
B. Navigational parameters				
Navigation between records	0	0	0	1
Navigation within records	1	0	0	1
Hyper based navigation outside the system or web	1	0	1	1
Navigation in thesaurus or other vocabulary control device	0	0	0	0
Navigation through term dictionary	0	0	0	0
Score : (Maximum 5)	02	00	01	03
C. Communication parameters				
Standard terminology	1	0	1	1
Screen layout	0	1	1	1
Consistency in prompts, menus and help massages	1	0	0	1
Novice and expert user interface	0	1	1	1
Facility to change theme / appearance	1	0	0	0
Multilingual option	0	0	0	0
Consistency in use of terminology	0	1	0	1
Score: (Maximum 7)	03	03	03	05
D. Support parameters				
Online help	1	0	1	1
Online tutorial	1	0	1	1
Appropriate error massage with instruction to solve access problems		0	0	0
Score : (Maximum 3)	02	00	02	02
Total Score (Maximum 20)	10	05	07	14

Table 7. Comparative statement of evaluation study

Table No.	Parameters	eGyankosh	ePG pathshala	MIT Resources	Sodhganga
2	Generic parameters	5	7	7	7
3	Content related parameters	4	4	4	6
4	Retrieval related parameters	13	7	13	19
5	Post processing parameters	4	4	3	5
6	Interface related parameters	10	5	7	14
	Score: (Maximum 72)	36	27	34	51

5. FINDINGS AND CONCLUSIONS

Online learning repositories are not only very important tools for general users, but also they are very important to academicians, researchers, scholars and others. From the above study it could be concluded that in the generic part of the evaluation we have noticed that maximum score of each repository could have been achieved 11 scores but no one got the full score. In the content related parameters part of

Table 8. Score obtained, total score and percentage of different parameters of the four database

Table No.	Parameters	Scores obtained/ Total Scores	Percentage
Table- 2	Generic Parameters	26/44	59.09
Table- 3	Content Related Parameters	18/24	75
Table- 4	Retrieval Related Parameters	52/104	50
Table- 5	Post Processing Parameters	16/36	44.44
Table- 6	Interface Related Parameters	36/80	45
Score: (Maximum)		148/288	51.39

Table 9. Ranking of digital reference sources

Name of the repositories	Score Obtained	Total Score	Percentage of parameters	Rank
eGyankosh	36	72	50	2
ePG Pathshala	27	72	37.5	4
MIT resources	34	72	47.22	3
Sodhganga	51	72	70.83	1

the evaluation we have noticed that maximum score of each repository could have been achieved 06 but only Sodhganga got the full score. In the retrieval related parameters part of the evaluation we have noticed that maximum score of each repository could have been achieved 26 scores but no one got the full score. In the post processing parameters section of the evaluation we have noticed that maximum score of each repository could have been achieved 09 scores but no one got the full score. In the interface related parameters section of the evaluation we have noticed that maximum score of each repository could have been achieved 20 but no one got the full score. Therefore, further development is necessary for the betterment of the repositories.

REFERENCES

1. eGyankosh. http://egyankosh.ac.in/bitstream/123456789/25604/1/Unit-4.pdf. (accessed on 19 October 2017)
2. Chow, A.S. & Croxton, R.A. A usability evaluation of academic digital reference services, 2014. http://crl.acrl.org/index.php/crl/article/view/16366/17812. (accessed on 25 October 2017)
3. Jabir, N.I. Digital (Electronic) reference services in academic libraries. *J. Coll. Educ. Women*, 2008, **19**(2).
4. Mukhopadhyay, P.S. Courseware on library information technology. prova prokashani, Kolkata, 2013, 216-218.
5. Singh, N.K. Digtal reference service in University libraries: a case study of the Northern India. *Int. J. Libr. Inf. Stud.*, 2012, **2**(4). 1-17. https://www.researchgate.net/publication/261288041 (accessed on 18 January 2018)
6. Kumah, C.H. A comparative study of use of the library and the internet as sources of information by graduate students in the University of Ghana. *Libr. Philos. Pract. (E-J.)*, 2015, **1298**. 1-20. http://digitalcommons.unl.edu/libphilprac/1298 (accessed on 19 January 2018)
7. Akor, P.U. & Alhassan, J.A. Evaluation of reference services in academic libraries: a comparative analysis of three universities in Nigeria. *J. Balkan Libr. Union*, 2015, **3**(1). 24-29. https://scholar.google.co.in (accessed on 24 January 2018)
8. Farmer, L.S.J. The life cycle of digital reference sources. *The Reference Librarian*, 2009, **50**. 117-136. doi: 10.1080/02763870902755957.
9. e-Gyankosh. https://oerknowledgecloud.org/sites/oerknowledgecloud.org/files/Chapter_15.pdf (accessed on 19 December 2017)
10. e-PGPathshala. http://epgp.inflibnet.ac.in/NME-ICT.php (accessed on 24 December 2017)
11. Wikis: MIT Resources. https://en.wikipedia.org/wiki/MIT_OpenCourseWare (accessed on 19 December 2017)
12. Wikis:Sodhganga.https://en.wikipedia.org/wiki/Shodhganga (accessed 22 December 2017)
13. Mukhopadhyay, P.S. Parameters for evaluation of databases [class handout]. The University of Burdwan, Burdwan, West Bengal.

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