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E-Information Literacy Index of University Teachers of Maharashtra, India: A Case Study

Prakash Bhairu Bilawar[*], Shamprasad M. Pujar[!] and Somanath Dasharath Pawar[#]

[*]*Balasaheb Khardekar Library, Shivaji University, Kolhapur - 416 004, India*
[!] *Indira Gandhi Institute of Development Research, Mumbai - 400 065, India*
[#]*Department of Statistics, Shivaji University, Kolhapur - 416 004, India*
[*]*E-mail: pbb_lib@unishivaji.ac.in*

ABSTRACT

The purpose of this paper is to propose an e-information literacy index that provides realistic values to distinguish whether university teachers are literate in regard to awareness and use of e-information resources by explaining the characteristics of e-information literate teacher. The present survey attempts to formulate e-information literacy index of university teachers by taking into consideration three components viz. awareness of e-resources, availability of ICT facilities and use of internet services and search techniques to retrieve e-information. The findings shows that 60.52 per cent teachers are e-information literate. Amongst the teachers, the index for Assistant Professors is highest followed by Professors and Associate Professors. It indicates that Assistant Professors are more e-information literate than their superiors. Amongst the universities, the index of Shivaji University, Kolhapur is highest. As far as author's consciousness, there are several indices meant for different purposes but in the higher education sector to define the characteristics of e-information literate university teacher in terms of an index is unique and special.

Keywords: E-information literacy; University teachers; Information literacy; Indicators

1. INTRODUCTION

Today, we leave in an era surrounded by digital sea of information. Owing to the availability of vast array of unfiltered information on a given topic, the process of identifying and selecting peculiar e-information has become complex. In this circumstance E-Information literacy directs the users towards authentic and reliable sources of information available online useful for their informed judgements against the quest for information. E-Information literacy is the ability to properly use and evaluate electronic resources, tools and services and apply it for lifelong learning process. E-information literacy among the university teachers contributes towards their learning process and brings in overall change in the way how they collect and use information.

The present study intends to define the e-information literacy rank amongst the university teachers in tech savvy environment considering their awareness, use and retrieval of e-information from e-resources in the form of an index value. E-information literacy index is a statistical measure used to determine how university teachers are making best use of e-information for their teaching and research purposes. The index values were determined against the responses given by teachers for proposed and defined clusters of components/ indicators mentioned in *Appendix A*. The exercise helped to enlist the qualities of e-information literate teachers in the vast and changing digital sea of information. It has been found that the formulated index values differ amongst teachers and the universities under study depending upon their ability, performance in regard to the use and searching techniques applied for getting e-information.

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2. LITERATURE REVIEW

Hargittai[1] recommend for the creation of an index variable as proxies for web-oriented digital literacy measures on Internet use and methodology based on verifying the validity of the measures derived from their relationship with actual skill measures. She again revisited her survey measures with new terms in order to assess the change in digital literacy measures of the respondents and found discrepancy older Internet terms and new web-based concepts thus resulting in change in the index values[2]. Thornbush[3] suggested S-E index that provides a broader classification of weathering processes based on visible surface forms in the field of archaeogeomorphological research. Katz & others[4] conducted a survey to measure the cumulative, holistic impact of discrete ICT (Information and Communication Technologies) and a composite digitisation. An index was developed based on six overarching components, viz. affordability, infrastructure investment, network access, capacity, usage, and human capital. The findings showed that proper ICT infrastructure and attention towards digital technology usage is required for better flow and awareness of digital literacy. Alguliyev & Others[5] explore an index for

evaluating the quality of research output of researchers with the 25 indices which shows that the weighted index may serve as a supplement to h-index and its variants. Sahoo[6] propose the I-index which states that an author's percentage shares in the total citations that his/her papers have attracted. The index is useful to know comprehensive idea of an author's overall research performance.

3. OBJECTIVES

The core objectives of the study :

(i) To know the level of awareness of e-resources and searching techniques applied by the university teachers in retrieving e-information

(ii) To study the availability of ICT facilities for the use of internet services by the university teachers; and

(iii) To formulate an e-information literate index of university teachers.

4. METHODOLOGY

For the present study, descriptive method of research has been used. The data was collected through structured questionnaire distributed to targeted sample of 360 university teachers of 43 different departments working in the 10 state universities of Maharashtra, India in the faculties of sciences, social sciences and humanities (languages). A total of 347 teachers responded (96.38 per cent) to the survey. Their literacy levels were tested based on their self-perceived skills and skills learnt with the help of others.

4.1 Methodology Used

Keeping in mind the search for e-information, access and retrieval techniques applied by a normal user, a common strategy in terms of methodological (measuring) indicators were suggested that defines the qualities of e-information literate user with an index value against suggested cut-off value. These methodological indicators were applied for the targeted group of teachers working in the universities under study. The proposed index is based on analysis of indicators against the clusters which results in certain startling outcomes.

The suggested clusters and their indicators may also be applied to other teachers working in different disciplines / universities by changing the clustered framework in regard to the ICT advancement and its searching techniques. To formulate an e-information literacy index of university teachers a series of questions were designed which comprised of 65 indicators comprising of tick marked and five point scale questions, which were equally weighted (0.33) Table 1 and grouped in 3 clusters of components viz. Awareness of e-resources (23 indicators); Availability of ICT facilities and Use of Internet Services (14 indicators) and the search techniques to retrieve e-information (28 indicators) to measure the e-information literate characteristics of the teachers, enlisted in *Appendix A*. The equal weight is calculated as 1/3 = 0.33 to represent the index value as '0' and '1' receptively. The resulted measures depend on the aspects related to e-information awareness and use, ICT facilities and searching skills which help in assessing their e-information literacy skills.

The proposed measuring indicators were tested with

Table 1. Weightage criteria

Components	Weightage
A. Awareness of e-resources [23 Indicators]	0.33 [0.33/23= @0.0143/ per Question]
B. Availability of ICT facilities and use of internet services [14 Indicators]	0.33 [0.33/14= @0.023/ per Question]
C. Searching techniques to retrieve e-information [28 Indicators]	0.33 [0.33/28= @0.011/ per Question]

responses given by the university teachers. However, before calculating the index except tick marked questions all the five point question response values were converted between 0 and 1 as 0, 0.25, 0.50, 0.75 and 1 in order to show the similarity that will be useful for calculating an index by proposing a cut-off value at 0.5.

Table 2. E-information literate index of the teacher

A	B	C	D	E	F	G (Index)	H (Literate/ Illiterate)
10	10	13.25	0.4348	0.7143	0.4732	0.5408	* 1

*1 = Literate and 0 = Illiterate

As a sample, the index of first teacher was calculated in the following way:

A = Sum of response value of first component

B = Sum of response value of second component

C = Sum of response value of third component

D = A/23, E= B/14, F= C/28

G = Index (Average of D, E and F)

H = The first teacher suppose to be e-information literate considering cut-off value at 0.5 value and the index is above cut-off value.

Accordingly, an index was calculated for all the teachers under study (shown in histogram) to represent whether they are e-information literate or illiterate.

It is clear from Fig. 1 and Table 3 the lowest index observed was 0.0766 and highest was 0.9167. Majority of the teachers are having e-information literacy index between 0.3 and 0.8. The index level was highest between the ranges 0.6 and 0.7. Out of 347 respondents, 23% (79) of university teachers are having e-information literacy index between 0.6 and 0.7. About

Table 3. Summary of an Index

Statistics	Value
Mean	0.5381
Standard error	0.0091
Median	0.5527
Mode	0.7222
Standard deviation	0.1704
Sample variance	0.0290
Kurtosis	-0.4425
Skewness	-0.2648
Range	0.8401
Minimum	0.0766
Maximum	0.9167
Sum	186.7232
Count	347.0000

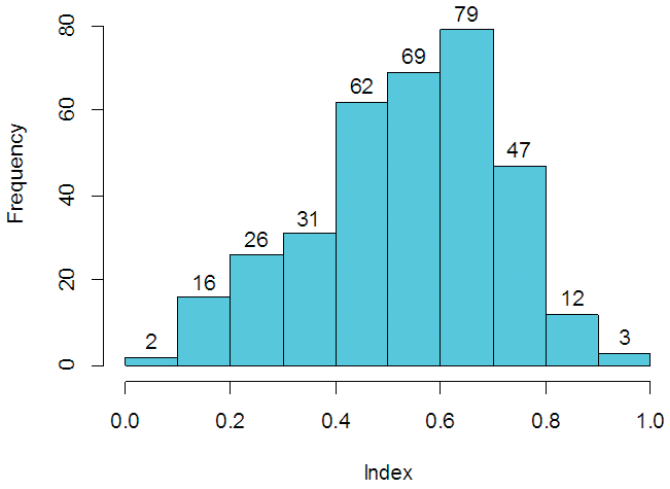

Figure 1. Histogram of an e-information literacy index of teachers.

74% (257) teachers are having e-information literacy index between 0.4 and 0.8. It has been found that the distribution of e-information literacy index is not symmetric owing to differing skill levels of teachers. Further, e-information literacy index has negatively skewed and it shows relatively flat distribution. 210 (60.52%) teachers were found to be e-information literate and remaining 137 (39.48%) were not e-information literate.

5. FINDINGS

From Tables 4 and 5, we may draw following findings;

- It is found that 210 (60.52%) teachers were e-information literate based on index value.
- When looked across the disciplines of sciences, social sciences and arts and humanities, it is proved that Science faculties (0.5835) are more e-information literate than Social Science (0.5427) and Arts and Humanities (0.4616) faculties.
- From the gender based analysis, it was found that the index is high in case of female teachers (0.5516) than the male teachers (0.5309).
- In addition, from the designation wise analysis it was found that index for Assistant Professors was highest (0.5621) followed by Professors (0.5338) and Associate Professors (0.4975).

Table 4. E-Information literate Index ratio

		Index
Faculty	Science	0.5835
	Social Science	0.5427
	Arts and Humanities	0.4616
Gender	Female	0.5516
	Male	0.5309
Designation	Assistant Professor	0.5621
	Associate Professor	0.4975
	Professor	0.5338

- Regarding university wise e-information literacy index, it was observed that the e-information literate index was higher in case of Shivaji University, Kolhapur (0.6093), followed by Sant Gadge Baba Amravati University, Amravati (0.5865), Swami Ramanand Teerth Marathwada University, Nanded (0.5716), North Maharashtra University, Jalgaon (0.5645), University of Mumbai, Mumbai (0.5466), Solapur University, Solapur (0.5338), University of Pune, Pune (0.5274), SNDT (Smt. Nathibai Damodar Thackersey) Women's University, Mumbai (0.5097), Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur (0.4978), Dr Babasaheb Ambedkar Marathwada University, Aurangabad (0.4324).

Table 5. University wise e-information literate Index ratio

University	Index
Sant Gadge Baba Amravati University, Amravati	0.5865
Dr Babasaheb Ambedkar Marathwada Uni, Aurangabad	0.4324
North Maharashtra University, Jalgaon	0.5645
University of Mumbai, Mumbai	0.5466
Rashtrasant Tukadoji Maharaj Nagpur Uni, Nagpur	0.4978
Swami Ramanand Teerth Marathwada Uni, Nanded	0.5716
University of Pune, Pune	0.5274
Shivaji University, Kolhapur	0.6093
SNDT (Smt. Nathibai Damodar Thackersey) Women's University, Mumbai	0.5097
Solapur University, Solapur	0.5338
Grand Total	0.5381

Thus from the above detailed explanations it is revealed that depending upon the ICT/self skills of university teachers in handling e-information, awareness about different e-resources, tools and techniques for searching, accessing and retrieving e-information either from the internet or from subscribed e-resources and availability of sufficient infrastructure at the universities, the e-information literacy index of teachers calculated varies from teacher to teacher amongst the faculties and universities. The awareness and use of Web 2.0 along with the internet services by the university teachers was an additional verifying criteria used to measure the e-information literacy level of the teachers in terms of an index value.

6. CONCLUSIONS

The difference in e-information literacy index among the institutions and groups may be attributed to the efforts taken by each of the universities in building the required ICT infrastructure, training teachers in the effective retrieval and use of e-information and teachers self skills. The poor index value of university teachers needs to be accounted with sufficient awareness campaigns, ICT facilities and online training about searching techniques by the universities/ university libraries. Further academic/learning and research tasks of the university teachers may be strengthened by arranging discipline specific user awareness programmes and also by allocating certain hours per week in the time-table especially for searching and seeking e-information from different sources. This also may be made as part of the continued education programme for faculty members to become independent learners.

REFERENCES

1. Hargittai, E. Survey measures of web-oriented digital literacy. *Social Science Computer Review*, 2005, **23** (3), 371-379.
2. Hargittai, E. An Update on survey measures of web-oriented digital literacy. *Social Sci. Comput. Rev.*, 2009, **27**(1), 130-137.
3. Thornbush, M.J. & Thornbush, S.E. The application of a limestone weathering index at churchyards in central Oxford, UK. *Applied Geography,* 2013, **42**, 157-164.
4. Katz, R. & Others, Using a digitization index to measure the economic and social impact of digital agendas. *Info.*, 2014, **1**(1), 32-44.
5. Alguliyev, R. & Others, An aggregated index for assessment of the scientific output of researchers. *Int. J. Knowledge Manag. Stud.*, 2015, **6** (1), 31-62.
6. Sahoo, S. Analyzing research performance: proposition of a new complementary index. *Scientometrics*, 2016, **108**(2), 489-504.
7. Investopedia. http://www.investopedia.com/terms/i/index.asp. (Accessed on 24 November 2016).

CONTRIBUTORS

Dr Prakash Bhairu Bilawar has completed his BLISc, MLISc and PhD in Library and Information Science from Shivaji University, Kolhapur. Presently working as 'Assistant Librarian' (Senior Scale) at B.B.K. Library (Knowledge Resource Center), Shivaji University, Kolhapur, Maharashtra. He has 20 research publications in journals, conference proceedings/books. His areas of interest are ICT, information sources and services.

Dr Shamprasad M. Pujar has received PhD in Library and Information Science from Karnataka University, Dharwad. Presently working as Deputy Librarian at Indira Gandhi Institute of Development Research, Mumbai. He has contributed more than 35 papers in journals and conferences. His area of interest include : ICT applications for libraries, Web 2.0, OERs, open access journals, altmetrics, MOOCs etc.

Mr Somanath D. Pawar is perusing his PhD (Statistics) from Shivaji University, Kolhapur. Presently working as Assistant Professor in Statistics at Department of Statistics, Shivaji University, Kolhapur. He has one research paper to his credit and has presented more than 5 research papers in conferences. His area of interest includes nonparametric statistical inference, applied statistics.

Appendix A

Measuring indicators for E-Information Literacy of the Teacher

Components	Indicators	Type of Questions	Weightage
A. Awareness of e-resources	1. Citation Indexes: Web of Science [SCI, SSCI, AHCI] SCOPUS etc 2. Digital Libraries/E-Print Archives/Institutional Repositories 3. Discussion forums/ Groups 4. E-Books 5. E-Journals (including Open Access/Free Journals) 6. Electronic Abstracting and Indexing Databases 7. Electronic Theses and Dissertations 8. E-Newspapers 9. General Search Engines 10. Journal contents alert services 11. Scholarly Search Engines 12. Subject Gateways and portals 13. Subject Specific Search Engines 14. E-resources from INFLIBNET consortium 15. Open access online databases/resources 16. Web 2.0 tools- Blogs 17. Chatting 18. Micro-blogs [Twitter] 19. Phone 20. Reference management tools like Zotero, Mendeley etc 21. RSS feeds 22. Social Networking sites 23. Wikis	All Tick [√] Marked questions	0.33 [0.33/23= @0.0143/ per Question]

B. Availability of ICT facilities and use of internet services	1. Computer 2. Internet connection 3. Multimedia Projector 4. Photocopying Machines 5. Printer 6. Scanner/Fax 7. CD-ROM/DVD databases 8. Communication i.e. e-mail, chatting, phone etc 9. Downloading information i.e. articles, reports, forms etc 10. Links to abstract, Full Text, Citation (reference) and other useful e- resources in the field 11. Listening to music and watching videos (Ex: You tube) 12. Reading online newspapers, newsletters, blogs etc 13. Searching information 14. Watching video lectures from academic/research organization	All Tick [√] Marked questions	0.33 [0.33/14= @0.023/ per Question]
C. Searching techniques to retrieve e-information	1. Directly going to source of information [Knowing web address from references] 2. E-Journals/Databases, websites 3. E-Resources linked through library website 4. General Search engines 5. Guided Search/FAQ/Help 6. Meta Search Engines 7. Scholarly Search Engines 8. Subject Directories/Gateways 9. Subject Specific Search engines 10. Use Subject bookmarking sites 11. Just enter keywords in simple search box 12. Just enter title or author in simple search box 13. Make use of Advance search options 14. Make use of Boolean operators [and, or and not] along with keywords 15. Make use of mathematical operators [+, -, *] along with keywords 16. Make use of Phrase search by putting content in “ ” 17. Make use of proximity operators [near, between etc] 18. Make search for content within specific domains [.edu, ac.in, co. in etc] 19. Make search for content within specific languages [English, Hindi, French etc] 20. Make search for content within the files [PDF, HTML, DOC, Xls etc] 21. Browsing Content from E-Print archives/Digital Library/ Institutional Repository 22. By browsing journal articles from Journal homepages 23. Search for articles using Google 24. Search for articles using Google Scholar 25. Search for articles using Journals database Search options 26. Through Abstracting and Indexing Databases 27. Through library OPAC [Article Indexing] 28. Through links provided in e-mail table of contents alerts	All 5 Point Scales questions	0.33 [0.33/28= @0.011/ per Question]