Assessment and Content Analysis of Highly Cited Publications in Reference Services

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ABSTRACT

The study is aimed to assess the top highly cited publications in the field of reference services. The data was extracted from Scopus database by searching "reference service" phrase in the document search tab and limited to social science subject area and journal sources type. The results were confined to LIS journals in source titles which retrieved 1861 number of articles from which top 50 cited articles have been selected for conducting the present study. A content analysis of these top 50 highly cited publications have been performed in order to assess their quality. The parameters of assessment were the authors, year of publication, top contributing countries, institutions and journals, year wise distribution and scores of contributing journals, subject areas, methodology, and number of references. In addition, literature review, hypotheses, research questions, the variations in findings and conclusion have also been studied. It was found from the analysis of results that the highly cited papers include single authorship pattern and were mostly contributed by USA. The majority of the cited articles have academic libraries and Information Technology as the research subject area and adopted survey method to conduct their studies. Reference Services Review was found as the top most contributing journal. The analysis of the results further shows that the maximum number of the cited papers is without literature review and research questions whereas not a single publication was found with a hypothesis. The maximum numbers of the highly cited publications were found without headings of findings, discussion and future suggestions but mentioned the conclusion separately and have included references in the range of 11-20.

Keywords: Content Analysis, Citations, LIS Journals, Highly cited Publications, Reference Service, Scopus.

INTRODUCTION

Citation metrics is a statistical tool in order to assess the quality as well as quantity of a research publication and it traces the research trend and suggests the possibility of future research in a specific research field. It also shows the extent of author's achievement and proliferation in a specific domain (Ellegaard and Wallin, 2015). It is one of the significant techniques in order to identify the trend of the research and to measure the scientific activities carried out by researchers or institutions. Though, it is a concept of library and information science but has a rising impact in the non-LIS community. It has been seen as a valuable method for assessing scientific production and to measure the researcher's performance and can be used in pure biographical and citation impact form (Das and Sahu, 2019). The use of descriptive metric analysis on specific research area provides whole scenario of scientific field rather than focusing

on micro concepts. These metrics gave a base to compare the research growth in many years in various disciplines for several purposes. It helps to analyze the past, present and immediate future research on particular research field (Skoie, 1999). Citation tracking and understanding their trends in context is a very important element for assessing the research impact. The citation of a paper in other studies not only measures the influence of that individual paper but also determine the entire research body in a specific domain. Eventually, the scientific impact of an article or research is largely depending upon the number of times it is being cited in other papers and on the role that it plays in its citing paper (Fang, 2015). Evaluation of characteristics pertaining in highly cited articles have become quite widespread in several discipline. The necessity is arising as funding agencies, countries, and universities are trying to gauge the research performance and identifying top researchers as well as their research impact. The most common approach used to understand these characteristics is the bibliometric method (Noorhidawati, *et al.* 2017). Every particular discipline has cited articles or those articles which receive highest number of citations in comparison to other papers published in the field. Analysis of these articles from different perspectives reveals the factor behind their highest citations and

also highlights the potential author, institution, countries, etc. These highly cited articles also show the preferences of research community and are considered as the indicators of scientific excellence of a specific subject field. Hence, the present study is an attempt to identify and analyze the characteristics of highly cited papers in the area of reference service to assess their quality and reasons behind their higher citations. The characteristics includes author, institutions, countries, journals, citation metrics of journals, publication year, authorship pattern, and other parameter of assessment like availability of literature review, hypothesis, research questions, number of references, etc. There are number of databases available to retrieve citation data such as Web of science, Scopus, etc., but the Scopus database has been used in the present study to collect the required data which is a well-known abstract and citation database from Elsevier.

LITERATURE REVIEW

After reviewing the related literature, the authors found that the assessment of highly cited articles is explored well in field of Library and Information Science form different perspectives. The studies reviewed have been described briefly and are arranged according to the level of relevancy related to the present study. Blessinger and Hrycaj (2010) analysed the content and authorship trends of 32 highly cited articles to influence the scholarly communication in the field of library and information science. Findings proved that collaboration has not been appeared as a substantial contributing aspect for the highly cited publication of LIS field. Levitt and Thelwall (2009) examined the 82 most highly cited articles of "Information Science and Library Science (IS&LS)" subject field in the Web of Science from the perception of first author, citation patterns and Interdisciplinarity. Interdisciplinary research was found favorable in library science field to improve the quality of research as the findings showed that the citation of articles solely published in IS&LS was less in comparison to those which published with at least one other different subject. Additionally, the authors with high H-index were likely to be more cited in comparison to those with low H-index. A moderate correlation were found between the citation ranking and the no. of years between publication year and peak year which indicates that most often in IS&LS the high quality methodologies are deployed after many years of the publication. Bauer, *et al.* (2016) investigated the most highly cited articles published between the year 2002-2012 in the subject category "Information Science and Library Science" (IS&LS) of Web of Science. In case of whole number counted the largest number of papers were contributed by the authors at Harvard University. On the other hand when using the fractional counting the Leiden University was leading the rank. It was found that co-authorships are grounded on the common interests in specific topic. Collection and exploitation of information in clinical practices; Use of the internet in public communication and commerce; and Scientometrics were emerged

as the three important topics between the year 2002-2012. Shah, *et al.* (2015) analysed the author self-citation behaviour in the Library and information science field. The findings of the study indicated that the articles produced by multiple authors are tends to receive more citation than those articles which produced by single author whereas, the number of co-authors in a paper doesn't affect the self-citations. Sahoo, *et al.* (2019) analysed the content and authorship trends of highly cited articles published in top ranked journals of Library and Information Science field. Among the prolific authors Loet Leydesdorff secured the top position and Netherland was found as the potential participating country among all the affiliating countries of authors. "Research impact measurement and research collaboration", "Research metrics and citation-based studies" and "Social networking" were revealed as the emerging fields of Library and Information Science research. Ivanovic and Ho (2016) identified and analysed the characteristics of highly cited articles published in the category "Information Science and Library Science" of social science citation Index. Harvard University, USA was proved as the most productive institution whereas University of Maryland, USA has the highest publication performance of first and corresponding author articles. More than 2/3 of the researchers were from the USA followed by researchers from Canada, the UK, and the Netherlands. Mushtaq and Zia (2019a) evaluated the contents of the highly cited articles of select Emerald LIS journals in order to discover the reason behind their high rate of citations and quality. The findings revealed that majority of the papers are produced by single authors and are contributed by USA. The number of highly cited articles adopted survey method and are published with social media as subject area. The results further showed that majority of the articles are without literature review, hypotheses and research questions. They have mentioned findings, discussion as well as conclusion separately and have cited references ranging from 21-30. Elia and Sife (2018) analysed the top ten most cited articles in the Library and Information Science field and delivered valuable information to identify remarkable articles that have provided a great contribution on LIS field. The result indicated that these ten papers created from various institutions in six countries mostly in Europe and North America. This study propounded that Library and Information Science research has switched towards exploring scientific publications and their influence via Bibliometrics, Citation analysis, and Scientometrics.

AIMS AND OBJECTIVES

The main aim of the study is to assess the top highly cited publications in the field of reference services. The broad objectives of the study are as follows:

To identify the total number of cited and uncited articles published in the field of reference services.

To trace the year wise distribution of the highly cited articles in reference services.

To identify the top contributing institutions and affiliated countries of the highly cited articles in reference services.

To determine the subject areas and type of methodology adopted by highly cited articles in reference services.

To find out the variation in findings, conclusion and references of these highly cited articles in reference services.

RESEARCH METHODOLOGY

The research methodology adopted to assess the highly cited publications in the field of reference services have been discussed under the following heads.

Data Source

The Scopus database has been used for retrieving the research publications in the field of Reference Services.

Search Statement

The search query or phrase "reference service" has been used in Scopus search interface under the venue names "Article title, Abstract, Keywords" and retrieved 2612. The results were limited to social science subject area, which refined the results to 2021. Out of these, 1900 results has been selected based on the 'journal' as source title which was further restricted to LIS Journals resulting into 1861 results for final analysis.

Selection of the Articles

The final records were sorted in descending order of citation counts. Subsequently, top 50 cited articles have been selected for conducting the present study.

Data Extraction

In order to identify the quality parameters and to know the reasons behind the higher citations of the articles, the required data was extracted by content analysis of top 50 highly cited articles performed on the basis of different parameters of assessment including the authors, year of publication, top contributing countries, institutions and journals, year wise distribution and scores of contributing journals, subject areas, methodology and number of references. In addition, literature review, hypotheses, research questions, the variations in findings and conclusion have also been studied.

Statistical Analysis

Microsoft Excel 2010 software have been used for descriptive statistical analysis of the authors, year of publication, countries, institutions and journals, year wise distribution and scores of contributing journals.

RESULTS

Top contributing authors

The one who made substantive contribution to research is given credit as authorship. The authors take the responsibility and accountability for published work. They ensure that the questions regarding the accuracy or reliability of any part of the work are appropriately examined and resolved. They agree to be accountable for all the aspects of the work and play a vital role in receiving higher citations of an article. Analysis of the results found that there are a total of 87 authors contributing in highly cited research articles related to reference services. Table 1 mentioned the top 10 authors and the analysis of the table revealed that Connaway, L.S., from U. S., Daniel, H. D., from Switzerland, Dickey, T.J., Janes, J., Kaske, N., Pomerantz, J. and Radford, M.L., from U.S. are on the top position with 2 articles each. Majority of the top 20 authors i.e., 75% are from United States. Similarly, Amini, Derakhshanfar, Dolatabadi and Kariman in 2012 found in their study that USA was a country of highest number of first author.

Year wise distribution

The publication pattern usually used to show the progress of literature in any specific subject area. It presents the trend of any publication by displaying a graph of growth and reduction of research in particular discipline. In order to provide insights into achievements and developments of reference services research, the publication trend of highly cited articles is presented in the Figure 1. It has been found from the analysis that the top 50 highly cited articles are published during the period of 1987 to 2011 and the maximum numbers of the top highly cited articles i.e., 14% are published in the year 2001.

Top Contributing Countries

Contributing countries is one the important aspects of getting higher citations as the people pay attention to the work that is produced across national boundaries. It is an indicator of recognition and engagement of a research paper. The more an article includes countries the more it tends to get citations. The number of countries helps to collaborate internationally as well as to attract large audiences. Figure 2 provides the list of top contributing countries. The findings revealed that there are a total of seven countries contributing in highly cited articles and United States has been demonstrated as the top most contributing country with 37 (74%) publications. The results are not surprising as it is in consistent with the findings of multiple studies including Hennessey and Afshar (2009); Ho, (2014); Shuaib and Costa (2015); Khan, *et al.* (2017); Mushtaq and Zia (2019b), which have revealed the same findings.

Top Contributing Institutions

The affiliation aspect of an article reflects the institutional support in terms of resources and intellectual minds. An article with multiple affiliations is tending to get higher citations and confer their scientific as well as institutional impact on research community. Affiliation is another factor in international collaboration of an academic research which is correlated with higher impact. Hence, it can be said that contributing institution in itself is not only a great factor of getting higher citation but also influence other factors of receiving higher scientific impact.

It has been found that a total of 48 institutions contributed in highly cited publications related to reference services and top 10 are shown in Table 2. Among all these institutions, Rutgers, The State University of New Jersey is on the top position with 3 (6%) articles followed by OCLC, with 2 (4%) articles as shown in Table 2.

Top Contributing Journals

Academic journals serve as a permanent and transparent platform for presenting and discussing the research. The impact of an
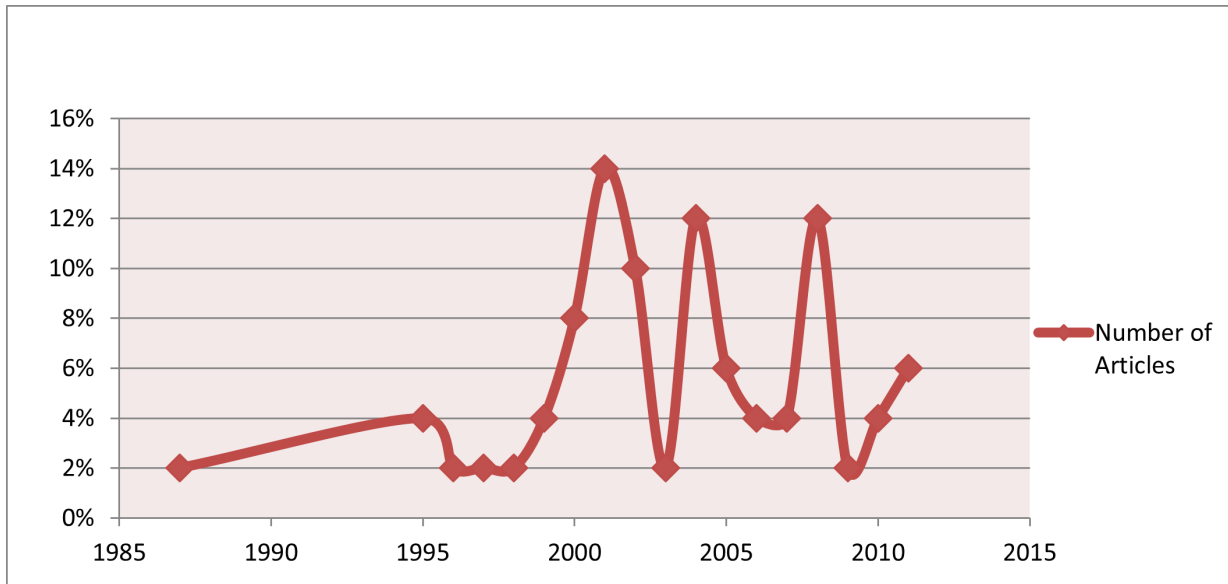

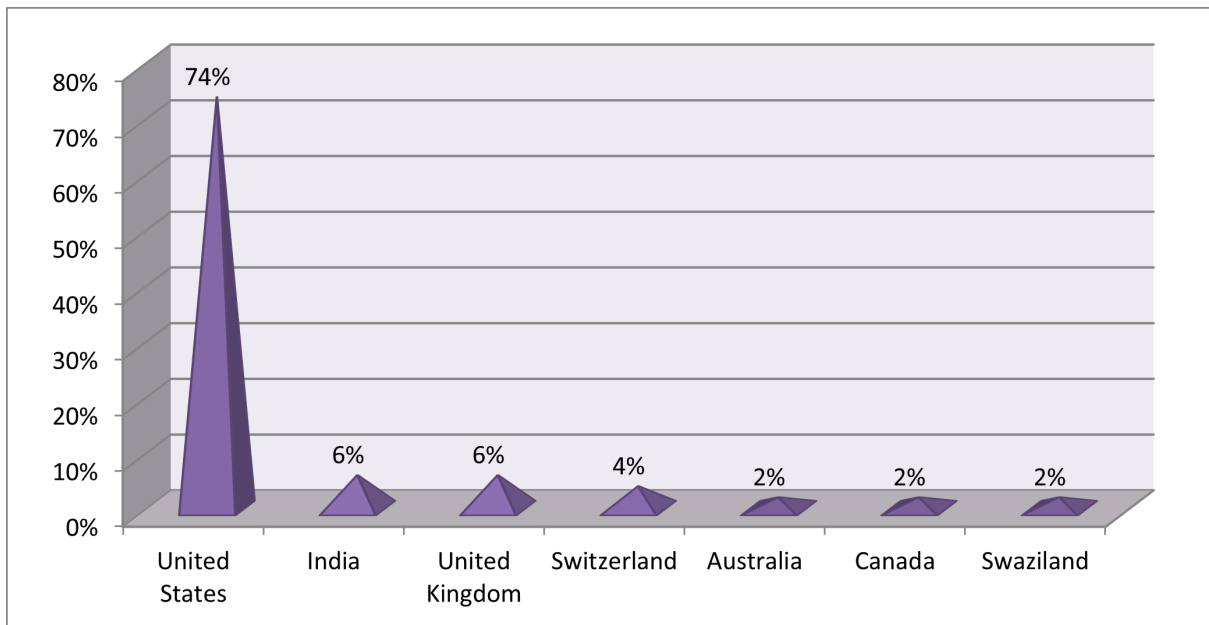**Figure 1:** Year wise distribution of publications.

Figure 2: Top Contributing Countries.

Table 1: Top Contributing authors.

Sl. No.	Authors Name	Affiliation	Place	Number of articles
1	Connaway, L.S.	OCLC Research	Dublin, United States	2 (4%)
2	Daniel, H.D.	University of Zurich	Zurich, Switzerland	2 (4%)
3	Dickey, T.J.	OCLC	Dublin, United States	2 (4%)
4	Janes, J.	University of Washington	Seattle, United States	2 (4%)
5	Kaske, N.	National Oceanic and Atmospheric Administration	Washington, D.C., United States	2 (4%)
6	Pomerantz, J.	The University of North Carolina	Chapel Hill, United States	2 (4%)
7	Radford, M.L.	Rutgers, The State University of New Jersey	New Brunswick, United States	2 (4%)
8	Abels, E.G.	Simmons College,	Boston, United States	1 (2%)
9	Allen, F.R.	University of Central Florida	Orlando, United States	1 (2%)
10	Amsberry, D.	Pennsylvania State University	University Park, United States	1 (2%)

Table 2: Top Contributing Institutions.

Sl. No.	Affiliation	Country	No. of articles
1	Rutgers, The State University of New Jersey	New Jersey, United States	3 (6%)
2	OCLC	Dublin Ohio, United States	2 (4%)
3	Pennsylvania State University	Pennsylvania, United States	2 (4%)
4	Washington State University Pullman	Pullman, Washington, United States	2 (4%)
5	San Diego State University	California, United States	2 (4%)
6	University of Maryland	Maryland, United States	2 (4%)
7	Indiana University	Indiana, United States	2 (4%)
8	The University of North Carolina at Chapel Hill	North Carolina, United States	2 (4%)
9	ETH Zurich	Zürich, Switzerland.	2 (4%)
10	University of Wisconsin Madison	Wisconsin, United States	2 (4%)

article on audience is largely dependent upon the reputation and status of a journal in which that article is published. The articles published in best journals of a field are likely to have higher impact in comparison to those articles which are published in low quality journals. It is revealed from the overall analysis that all the highly cited articles are published in total of 20 journals. Table 3 shows the list of top 10 contributing journals of highly cited publications related to Reference Services and among these entire journals, Reference Services Review is found as the top most contributing journal with 8 articles followed by Reference and User Services Quarterly with 7 articles. Apart from providing the list of contributing journals it is also important to trace out the publication trend of individual journals in the top highly cited articles related to reference services. Table 3 also presents the year wise distribution of all the contributing journals in highly cited publications. Though Reference and User Services Quarterly is on the second position and both College and Research Libraries as well as Journal of Academic Librarianship are on the third position but all these three journals are publishing highly cited articles in five different years whereas the Reference Services Review, which proved as the top contributing journal in highly cited articles, has published the top cited articles in only three different years. The results indicate that the maximum number of the top cited articles have been published by the Reference Services Review journal i.e., 4 articles in the year 2001.

Table 3: Top Contributing Journals.

Sl. No.	Journals	Publisher	Number of articles	Publication year	No. of Publications
1	Reference Services Review	Emerald	8 (16%)	2001	4
				2002	2
				2004	1
				2008	1
2	Reference and User Services Quarterly	American Library Association	7 (14%)	1999	1
				2000	2
				2001	1
				2002	1
				2004	2
3	College and Research Libraries	Association of College and Research Libraries	5 (10%)	1996	1
				1997	1
				1999	1
				2002	1
				2011	1
4	Journal of Academic Librarianship	Elsevier	5 (10%)	1995	1
				2000	1
				2004	1
				2005	1
				2008	1
5	Journal of Documentation	Emerald	4 (8%)	2002	1
				2008	2
				2009	1
6	Electronic Library	Emerald	3 (6%)	2000	1
				2004	1
				2010	1
7	Information Processing and Management	Elsevier	2 (4%)	1987	1
				2004	1
8	Library and Information Science Research	Elsevier	2 (4%)	2006	1
				2011	1
9	Library Trends	Johns Hopkins University Press	2 (4%)	1998	1
				2001	1
10	Reference Librarian	Taylor and Francis	2 (4%)	2007	1
				2010	1

CiteScore of Contributing Journals

The CiteScore is the number of citations received by a journal in one year to documents published in the three previous years, divided by the number of documents indexed in Scopus published in those same three years. Table 4 shows the cite scores of only top 10 contributing journals in highly cited articles related to reference services and it is revealed that among all the contributing journals, *Reference and User Services Quarterly* has the highest cite score while the *Library Trends* has the lowest cite score (0.40).

Parameters of Assessment

Besides contributing journal, institution, countries, etc. there are many other parameters for assessing the quality of the articles such as authorship pattern, research methodology, research area as well as the availability of literature review, hypothesis and research questions. It would be interesting to know that

Table 4: Cite Score of Contributing Journals.

Sl. No.	Journal	Cite Score
1	Reference Services Review	1.20
2	Reference and User Services Quarterly	6.42
3	College and Research Libraries	1.70
4	Journal of Academic Librarianship	2.32
5	Journal of Documentation	1.44
6	Electronic Library	0.99
7	Information Processing and Management	4.23
8	Library and Information Science Research	1.70
9	Library Trends	0.40
10	Reference Librarian	0.58

Table 5 (i): Parameters of Assessment.

Authorship pattern	Number of Articles	Parameters	Yes	No
One author	22 (44%)	Literature Review	15 (30%)	35 (70%)
Two author	17 (34%)	Hypothesis	-	50 (100%)
Three author	9 (18%)	Research Question	5 (10%)	45 (90%)
Four author	1 (2%)			
Five author	-			
More than five author	1 (2%)			

Table 5 (ii): Parameters of Assessment.

Research Areas	No. of articles	Research Methodology	No. of articles
Academic Libraries	18 (36%)	Survey (Questionnaire/ Interview)	20 (40%)
I.T.	18 (36%)	Content Analysis	8 (16%)
Information Seeking Behaviour	4 (8%)	Conceptual	12 (24%)
Knowledge Management	3 (6%)	Case Study	3 (6%)
LIS	1 (2%)	Citation Analysis	1 (2%)
Information Retrieval	1 (2%)	Research Model	1 (2%)
Social Media	2 (4%)	Review	5 (10%)
Bibliometrics	1 (2%)		
Citation Analysis	1 (2%)		
Reference Sources	1 (2%)		

which of these components contribute in making a research work more impactful. Table 5 (i) shows the quality of highly cited papers on different parameters including authorship pattern, literature review, hypothesis, research questions. Table 5 (ii) shows the other parameter of assessment namely, research areas and research methodology. It is evident from the analysis that maximum numbers of the highly cited articles (44%) are produced by one author whereas majority of the articles 70% are without having literature review and 90% are without research questions. Moreover, there is not a single article which is having a hypothesis. So far as the research area is concerned, the Academic libraries and Information technology constitutes as the major research area with 18 (36%) articles each. As far as the research methodology of highly cited articles is concerned, the maximum numbers of the articles (40%) have adopted survey method to conduct their studies.

Table 6: Variation in Findings, Conclusion and References.

Findings		References	
Findings	19 (38%)	1-10	5 (10%)
Findings and Discussion	4 (8%)	11-20	12 (24%)
Findings and Conclusion	-	21-30	9 (18%)
Without Findings	27 (54%)	31-40	10 (20%)
Discussion		41-50	4 (8%)
Discussion	13 (26%)	51-60	3 (6%)
Findings and Discussions	5 (10%)	61-70	3 (6%)
Discussion and Conclusion	1 (2%)	71-80	1 (2%)
Without Discussion	31 (62%)	81-90	-
Conclusion		91-100	-
Conclusion	36 (72%)	Above 100	3 (6%)
Discussion and Conclusion	1 (2%)	Nil	-
Findings and Conclusion	-		
Without Conclusion	13 (26%)		
Suggestions For Future Research			
Yes	6 (12%)		
No	44 (88%)		

Variation in Findings, Conclusion and References

There are a number of ways to present the results of a research in an article. Some researchers mention findings, conclusions, discussion and suggestions separately while some describe them in a combined form. Furthermore, the number of references included in a study shows the extent of its authenticity as the referencing allows to acknowledge the contribution of other writers and researchers in the work. Table 6 shows the number of references included and how the cited articles write their finding, discussion as well as conclusion. It has been found from the analysis that the maximum number of the cited articles are without findings, discussion and future suggestions as headings but mention the conclusion separately. Moreover, the result also shows that all the cited articles include references and majority of the cited articles have references in the range of 11-20 whereas none of the articles include reference in the range of 81-90 and 91-100.

CONCLUSION

There are a number of metrics and measurement techniques available for research analysis and management. These cannot be a replacement of peer review system or expert opinion but gives an overview of worth and impact of particular research in any area. Citation metrics is one of the most substantial metrics or value indicators of research in a specific subject field. It is a quantifiable measure of academic research output and citation rates are heavily dependent upon the discipline as well as the number of persons employing in that area. This metrics examines the citation relationships between authors and their work. The number of times an article cites in other articles is widely used as a measure of impact of that individual paper on the scientific community. Analysis of most frequently cited articles in a specific field points out the classic author, institutions, country in that specific field and also reveals the influence of the field in a scientific research community. Hence, an attempt has been made to assess the highly cited publications in reference service area. It has been found from the analysis of the results that the highly cited papers include single authorship pattern and belong mostly to the USA. The majority of the cited articles has academic libraries and Information technology as their subject area and has adopted survey method to conduct their studies. Reference Services Review journal was found as the top most contributing journal in highly cited publications but in case of the cite scores of all the contributing journals, Reference and User Services Quarterly secured the highest cite score while the Library Trends has the lowest cite score. The study shows that the maximum numbers of the cited papers are without literature review and research questions and more importantly not a single publication were found with a hypothesis. The maximum number of the highly cited publications is without the headings of findings, discussion and future suggestions but have mentioned conclusion of the study separately and have included an average of 11-20 references in their studies.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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