

THE BOOK

This edited volume provides various perspectives on metric analyses in library and Information Science. This volume focuses on the viewpoints of researchers, librarians, information professionals, publishers, and library users in India. This volume provides an excellent overview of metrics which includes the aspects of bibliometrics, scientometric, informatics, cybermetrics and webometric analyses and also help readers find, retrieve, read and use the research they need. The Data-driven approach describes a strategic process of leveraging insights from data to identify new opportunities, better serve users, improve the usage, improve the services and more. It allows libraries to use evidence-based data to make decisions and plan carefully to fulfil the objectives. The "data-driven" approach means it based on data analysis and interpretation of the bibliographies, citations and various indexes. A data-driven approach enables library professionals to examine and organize their data with the aim of better serving their users. Keeping this in mind, 30 papers from library and information science professionals from all over the country were carefully selected and titled Knowledge Librarianship: A Data-Driven Approach. Contents have been edited suitably to make the theme easy to grasp for the reader. This edited volume has three themes, i) Bibliometrics Analysis of Research Publications, ii) Scientometric Analysis of Research Literature, and iii) Webometric Analysis of Content and Websites.

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Mapping of Research Productivity on Constructivism in the Open Access Sources from 2016 – 2020 : A Scientometric Analysis

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INTRODUCTION

Learning – the specialty of human race. Learning stands for all those changes and modifications in the behavior of the individual which he/she undergoes during his/her life time. According to Kimble (1961) learning is a relatively permanent change in behavioral personality that occurs as a result of reinforced practice (Mangal, 2008). Human learning can be constructed; that is the learners can build new knowledge upon the foundation of previous learning. This previous learning or knowledge influences what new or modified knowledge of an individual will construct from new learning experiences (Phillips, 1995) and this is the core idea behind Constructivism. Constructivism is 'an approach to learning that holds that people actively construct or make their own knowledge and that is reality determined by the experiences of the learner' (Elliott et al., 2000, p. 256).

TYPES OF CONSTRUCTIVISM

Constructivism can be broadly classified into three categories, namely; cognitive constructivism, social constructivism and radical constructivism.

Cognitive Constructivism : It states that knowledge can be constructed based on the existing cognitive structures. This approach is based on the theory of Piaget's Cognitive Development (1936).



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Social Constructivism : It states that knowledge can be constructed by the individuals through the interactions with their culture and society and it is considered as a collaborative learning process. This approach was developed by Lev Vygotsky (1978).

Radical Constructivism : It states that knowledge can be constructed rather than perceived through senses. This approach was developed by Ernst von Glasersfeld (1974). (Ernest, 1994, p.8)

SALIENT FEATURES OF CONSTRUCTIVISM

Constructivism is exclusively based on human learning and knowledge construction. Based on the research and findings of various research on constructivism by eminent educationists, psychologists and experts, the salient features of the constructivism can be listed as follows;

- Knowledge is constructed, rather than innate, or passively absorbed (Phillips, 1995). It is the individual efforts of the learner that decide the quantity and quality of the knowledge acquired.
- Learning is an active process that proceeds from womb to tomb. Parents, family Members, society, life incidents and all the experiences insist learning.
- All knowledge is socially constructed (Dewey, 1938). The learning and the knowledge Construction has its own cultural and social background of the learner where he/she lives or in other words the environment is an important factor that contributes the knowledge construction.
- All knowledge is personal (Fox, 2001). Learning can't be generalized as it is a matter of individualistic efforts. Also the level of attention, observation, absorption, understanding and interpretation may differ from person to person.
- Learning exists in the mind (Driscoll, 2000). The knowledge can exist within the human mind and the learners are continuously trying to build their own mental model of the world based on their perception.

REVIEW OF RELATED LITERATURE

Yu, T and et.al (2021) analysed 1526 works from the literature on disaster risk perception from 2000 to 2020 in the Web of Science core collection database as the research subject. The CiteSpace knowledge graph analysis tool was used to visual analyze the country, author, institution, discipline distribution, keywords, and keyword clustering mapping. The paper drew the following conclusions. Firstly, disaster risk perception research has experienced three stages of steady development, undulating growth, and rapid growth. Secondly, the field of disaster risk perception was mainly concentrated in the disciplines of engineering, natural science, and management science. Thirdly, meteorological disasters, earthquakes, nuclear radiation, and epidemics were the main disasters in the field of disaster risk perception. Residents and adolescents were the main subjects of research in the field of disaster risk perception. Fourthly, research on human

risk behavior and risk psychology and research on disaster risk control and emergency management were two major research hotspots in the field of disaster risk perception. Finally, the research field of disaster risk perception is constantly expanding. There is a trend from theory to application and multi-perspective combination, and future research on disaster risk perception will be presented more systematically. The conclusion can provide a reference for disaster risk perception research, as well as directions for future research.

Raja Thangiah and et.al (2021) have studied the research productivity in the field of Assistive Technology from 2011 to 2020 from SCOPUS database. The results revealed that, out of 948 publications from 448 sources, 576 publications in journals, and 2925 authors and contributors. More than twenty countries and twenty affiliations collaborated there in this research productivity in Assistive Technology with 3.45 collaborative indexes. Research on developmental disabilities was the best source and Lancioni GE was the best author in assistive technologies. Out of 948 articles PLOOG BO, 2013 was the number one article and got more citations.

OBJECTIVES OF THE STUDY

The main objectives framed for the present study were:

- To identify the most cited sources
- To find out the most frequently used words in the research output on constructivism
- To identify the most cited papers in the research output on constructivism
- To analyze the H-Index of the author in the research output on constructivism
- To analyze the H-Index of the sources in the research output on constructivism
- To identify the most contributing affiliations in the research output on constructivism
- To identify the top source of publications in the of research output on constructivism

LIMITATIONS OF THE STUDY

- The study covers the research productivity in the area of constructivism from 2016 to 2020 only.
- The study covers the research productivity in the area of constructivism from open access sources in the Scopus database.

RESEARCH METHODOLOGY OF THE STUDY

There are various sources contributing to the research productivity in the field of constructivism in the open access sources. The necessary data was collected from Scopus database from 2016 to 2020. A total of 988 documents were downloaded and analyzed by using the R programming as per the objectives of the study.

MAJOR FINDINGS OF THE STUDY**Table 1. Main Information about the Data**

| <i>Description</i> | <i>Results</i> |
|--------------------------------------|----------------|
| Main Information About Data | |
| Timespan | 2016:2020 |
| Sources (Journals, Books, etc) | 640 |
| Documents | 988 |
| Average years from publication | 2.72 |
| Average citations per documents | 3.338 |
| Average citations per year per doc | 0.8068 |
| References | 46588 |
| Document Types | |
| Article | 753 |
| Book | 2 |
| Book Chapter | 19 |
| Conference Paper | 99 |
| Editorial | 9 |
| Letter | 1 |
| Note | 11 |
| Review | 93 |
| Short Survey | 1 |
| Document Contents | |
| Keywords Plus (ID) | 1858 |
| Author's Keywords (DE) | 3418 |
| Authors | |
| Authors | 2004 |
| Author Appearances | 2099 |
| Authors of single-authored documents | 451 |
| Authors of multi-authored documents | 1553 |
| Authors Collaboration | |
| Single-authored documents | 470 |
| Documents per Author | 0.493 |
| Authors per Document | 2.03 |
| Co-Authors per Documents | 2.12 |
| Collaboration Index | 3 |

Table 1 discovered the sources in the mentioned period from 2016 to 2020. Overall 988 documents from 640 different types of sources includes article, book chapter, books, conference paper, editorial, letter, note, review and short survey in open access sources

of Scopus database. The documents covered 1858 keywords and 3418 author keywords. Out of 988 documents 451 papers written by single authors and 1553 papers by multi authors.

Table 2. Most Published Sources

| <i>Sources</i> | <i>Articles</i> |
|---|-----------------|
| International Organization | 260 |
| European Journal Of International Relations | 187 |
| Computers & Education | 137 |
| International Journal of Science Education | 96 |
| International Studies Quarterly | 91 |
| Journal of European Public Policy | 89 |
| Science | 89 |
| J Chem Educ | 82 |
| Educational Psychologist | 80 |
| Review of International Studies | 79 |
| Journal of Educational Psychology | 73 |

Table 2 revealed that out of the 988 documents, 260 articles were published in Journal of International Organization, followed by European Journal of International Relations had 187, Computers and Education had 137, International Journal of Science Education had 96, International Studies Quarterly had 91, Journal of European Public Policy and Science had 89, Journal of Chemistry Education had 82, Educational Psychologist had 80, Review of International Studies had 79, Journal of Educational Psychology had 73, Educational Researcher and International Security had 73 and other sources having below 60 publications.

Table 3. Most Frequent Words

| <i>Words</i> | <i>Occurrences</i> |
|----------------------|--------------------|
| Human | 83 |
| Students | 67 |
| Female | 52 |
| Humans | 52 |
| Male | 50 |
| Education | 46 |
| Teaching | 46 |
| Article | 42 |
| Adult | 39 |
| Learning | 38 |
| qualitative research | 32 |
| education computing | 27 |
| constructivism | 24 |
| e-learning | 24 |

Table 3 explored that out of 1858 keywords, the word Human was used in 83 times, followed by students had 67, Female had 52, Humans had 52, Male had 50, Education and Teaching had 46, Article had 42, Adult had 39, Learning had 38, qualitative research had 32, Educational Computing had 27, Constructivism and e-learning had 24 times used in the documents.

Table 4. Most Citations of the Documents

| <i>Paper</i> | <i>DOI</i> | <i>Total Citations</i> | <i>TC per Year</i> | <i>Normalized TC</i> |
|---|-------------------------------|------------------------|--------------------|----------------------|
| Greenhow C, 2016, Learn Media Technol | 10.1080/17439884.2015.1064954 | 175 | 29.167 | 23.939 |
| Deslauriers L, 2019, Proc Natl Acad Sci U S A | 10.1073/pnas.1821936116 | 124 | 41.333 | 40.407 |
| Kokotsaki D, 2016, Improv SCH | 10.1177/1365480216659733 | 116 | 19.333 | 15.868 |
| Kukulka-hulme A, 2018, Br J Educ Technol | 10.1111/bjet.12580 | 70 | 17.5 | 22.376 |
| Zeitlin J, 2018, J Eur Public Policy | 10.1080/13501763.2017.1363269 | 67 | 16.75 | 21.417 |
| Solomon T, 2017, Eur J Int Relat | 10.1177/1354066116634442 | 64 | 12.8 | 13.603 |
| Kendler Ks, 2016, World Psychiatry | 10.1002/wps.20292 | 53 | 8.833 | 7.25 |
| Feklyunina V, 2016, Eur J Int Relat | 10.1177/1354066115601200 | 44 | 7.333 | 6.019 |
| Hay C, 2016, New Polit Econ | 10.1080/13563467.2016.1158800 | 43 | 7.167 | 5.882 |
| Harrison Cj, 2016, Perspect Med Educ | 10.1007/s40037-016-0297-x | 34 | 5.667 | 4.651 |
| Dennick R, 2016, Int J Med Educ | 10.5116/ijme.5763.de11 | 31 | 5.167 | 4.241 |
| Kay D, 2016, Adv Physiol Educ | 10.1152/advan.00132.2015 | 31 | 5.167 | 4.241 |

Table 4 shows that, among the 988 documents, Greenhow (2016) article got 175 citations, followed by Deslauriers (2019) got 124, Kokotsaki (2016) got 116, Kukulka-Hulme got 70, Zeitlin (2018) got 67, Solomon (2017) got 64, Kendler (2016) got 53, Feklyunina (2016) got 44, Hay (2016) got 43, Harrison (2016) got 34, Dennick and Kay (2016) got 31 each respectively.

Table 5. Most Affiliations of the Documents

| <i>Affiliations</i> | <i>Articles</i> |
|----------------------------------|-----------------|
| University of California | 13 |
| Universitas Pendidikan Indonesia | 11 |
| University of Cambridge | 11 |
| University of the Free State | 11 |
| Utrecht University | 11 |
| Universiti Teknologi Malaysia | 9 |
| University of Kwazulu-natal | 9 |
| National University of Ireland | 8 |
| University of South Africa | 8 |
| Aarhus University | 7 |
| National University of Singapore | 7 |
| Universitas Indonesia | 7 |
| Universitas Negeri Padang | 7 |

Table 5 revealed that out of 988 articles were published in the year 2016 to 2020 under various affiliated institutional contributions. This table found out top ten affiliations with their articles contributions. University of California contributed 13 articles followed by University of Pendidikan Indonesia, University of Cambridge. University of the Free State and Utrecht University had 11, University Teknologi Malaysia and University of Kwazulu-Natal had 9, National University of Ireland and University of South Africa had 8, Aarhus University, National University of Singapore, Universities Indonesia, and Universities Negeri Padang had 7 articles respectively.

Table 6. Source Impacts of the Documents

| <i>Source</i> | <i>h_index</i> | <i>g_index</i> | <i>m_index</i> | <i>TC</i> | <i>NP</i> | <i>PY_start</i> |
|--|----------------|----------------|----------------|-----------|-----------|-----------------|
| Journal Of Physics: Conference Series | 3 | 3 | 0.75 | 23 | 36 | 2018 |
| Universal Journal of Educational Research | 2 | 4 | 0.5 | 24 | 11 | 2018 |
| Eurasia Journal of Mathematics, Science and Technology Education | 5 | 8 | 0.8333333333 | 71 | 10 | 2016 |
| International Journal of Emerging Technologies in Learning | 3 | 5 | 0.5 | 34 | 10 | 2016 |
| IOP Conference Series: Materials Science and Engineering | 2 | 2 | 0.4 | 11 | 10 | 2017 |
| Sustainability (Switzerland) | 4 | 7 | 0.8 | 51 | 10 | 2017 |
| E3S Web of Conferences | 1 | 1 | 0.25 | 3 | 9 | 2018 |
| Education Sciences | 3 | 5 | 0.6 | 26 | 9 | 2017 |
| Polis (Russian Federation) | 1 | 1 | 0.2 | 4 | 9 | 2017 |
| Journal of Chemical Education | 3 | 5 | 0.5 | 30 | 8 | 2016 |
| Synthese | 3 | 3 | 0.5 | 16 | 7 | 2016 |
| European Journal of International Relations | 5 | 6 | 0.8333333333 | 144 | 6 | 2016 |

Table 6 analyzed that, overall 988 documents published in the 640 sources and out of these Journal of Physics: Conference Series, Education Sciences, Journal of Chemical Education and International Journal of Emerging Technologies in Learning, and Journal of Chemical Education got 3 h-index, followed by Universal Journal of Educational Research and IOP Conference Series: Materials Science and Engineering got 2, Eurasia Journal of Mathematics, Science and Technology Education and European Journal of International Relations got 5, E3S Web of Conferences and Polis (Russian Federation) got 1 h-index each respectively.

CONCLUSION

Constructivism is a constructive and promising area of research, which include philosophical, sociological, psychological, humanitarian, and all other disciplinary aspects. The analysis of the research productivity on constructivism revealed a gradual hike in the number of publications. The present analysis revealed that human was the most mentioned keyword (83 times) in the documents, which clearly proclaimed the affiliation

of the research on constructivism with the mankind. Because of its worthiness in the current context, the authors are recommending to enhance the number of similar studies in all disciplines.

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