Mapping of Research Output on Learning Disabilities: A Bibliometric Study

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Abstract
This paper aims to analyze a bibliometric study mapping of research output on Learning Disabilities (LD). All articles relevant to LD research have been retrieved using the Web of Science (WoS) database. The journals' impact factor was taken from the Journal Citation Report (JCR) of the 2019 edition (compiled by Clarivate Analytics) and referred to as IF2019. The Hirsch Index (h-Index) was collected from the database of the most productive writers and organizations. Bibliometric analysis and data matrixes for co-citation, linking, scientific collaboration analysis, co-word analysis, and visualizing bibliometric networks were used by many important bibliometric tools, such as Biblioshiny, ScientoPy, HistCite, BibExcel, and VOSViewer. The study's key results were that 2647 research papers published in 2016-2020 were the largest number of research papers. Total Global Citation Sources (49465) was the highest in the years 2006-2010. Wiley's top publisher distributed the highest number of articles (829) on LD with Z9, 15905, U1 is 713,

U2 is 10199, and the USA's highest number of citations is 15493. The most productive city in the USA was Hoboken, with 1,047 articles published. The most important papers on learning disabilities were published in the journal of learning disabilities.
Keywords:Learning disabilities, LD, Learning disorder, Bibliometric study, Scientometrics

Introduction

The term *Learning Disability (LD)*, and the concept to which it refers, is relatively new. LD was identified as a specific condition in the 1960s by a group of parents and advocates who observed unique learning styles in their children(Albrecht et al., 2006). Moreover, LD is a common term that refers to a heterogeneous category of conditions manifested by severe difficulties in developing and using listening voice, reading, writing, reasoning, or mathematical abilities. Due to the central nervous system's dysfunction, these conditions are inherent to the person and can occur during life(Learner, 1981).The LD is a decreased mental capacity and difficulty with everyday activities such as household chores, socializing, or handling money that affects people over their entire lives. Persons with learning disabilities appear to require more time and will need help acquiring new skills, intricate knowledge, and contact with others (Borg et al., 2006; Hammill et al., 1988). Kirk (1992) describes LD as a mechanism that impacts people of all ages' language and academic performance. The explanation for the issues is either neurological or emotional/compartmental illness.

Moreover, a learning disability refers to delayed development of one or more voice, language, reading, theology, writing, or arithmetic processes due to potential brain dysfunction and disruptions of the emotion and acting, not mental weakness, sensory deprivation, or cultural or educational causes. The widely accepted definition of learning disability is a cognitive, neurological, or psychological impairment that impairs the ability to learn and, in particular, impairs the communication capacity and potential of an individual to be effectively taught (Willis, 2007). Bastable et al. (2011) have discussed, "LD is an umbrella term that is used to describe an array of conditions including dyslexia dyscalculia and auditory processing disorder." Lack of memory function affects learning. This memory is critical for learning impairments such as reading handicaps, mathematical disability, and writing speech. Analysis suggests several approaches to improve children's working memory with intellectual disabilities in working memory (Malekpour et al., 2013). Persons with learning disabilities appear to require more time and will need help acquiring new skills, complex knowledge, and contact with others (Ormrod, 1997).

Cole and Eales (1917) researched the growth of literature employing bibliographical references in comparative anatomy in 1917 (Cole & Eales, 1917; Osareh, 1996). In 1969 place in the "statistical bibliography,"the renowned British scientist Allen Prichard first proposed the term"Bibliometrics."This term is used to denote the official birth of bibliometrics(Pritchard, 1969).

At present, this work has gained more and more coverage. The bibliometrics most apparent benefit is studying co-citations, regional distribution, and word frequency, enabling scholars to examine particular research fields and draw beneficial conclusions. Bibliometrics was previously commonly used in hotspots (Yeung et al., 2017a). In co-authorship (Sweileh et al., 2016). in co-citations and the growth of the fields as a whole (Merigó et al., 2017;

Yeung et al., 2017b). This study's purpose mapping of research output on learning disabilities was a bibliometric analysis of 1970–2020 (50 years).

Review of literature

This study presents the bibliometrics analysis of the work done in the major emerging field of LD. The overwhelming majority of the papers were in English (10417), and research in developmental disabilities was the most prolific journal in the area. The study also highlights the rise of students living with disabilities (Vijayalakshmi & Swaminathan, 2017). Between 5 and 8% of school-age children have memory or cognitive deficits in one or more mathematical domains that interfere with their ability to learn concepts or practices (Geary, 2004). Likewise, Black's (1974) study aimed to increase learning disabilities between 1962 and 1972 in reading deficiencies and learning disorders. The study of Gupta & Bhattacharya (2004)seeks to emphasize the role of bibliometric in the analysis of scientific and technological dynamics. The bibliometric instruments and techniques are studied to discuss and appreciate the dynamics of scientific fields. Hussain et al.(2020)focused the study a bibliometric review for widely cited clinical findings of the 2009–2019 research period was the key objective of the study to assess Autism Spectrum Disorders (ASDs).

Boote et al. (2015)study were aimed to summarize the literature published between 1995 and 2009 regarding public participation in health research. The study founded that 683 papers, 297 US papers, and 223 UK paper papers were listed.Hussain & Swain (2011) study found that the European Journal of Operational Research is at the forefront of the Computers in Human Behavior, followed by computer models. The USA country's productivity is far higher in the United Kingdom, Taiwan, China, and Canada than in any contributing country. Similarly, Ahmad et al., (2017) study focused on the merits of the research evaluation for different professional societies, individual scientists, and researchers. In addition to the rankings of the environmental engineering journals according to SCImago, the journal impact factor, Eigenfactor Score, and H5 in 2015, all selected journals were indexed in Institute for Scientific Information and Scopus.

Casas-Tost & Rovira-Esteva(2015)study aims to map Chinese language pedagogy from 1966 to 2013, a bibliometric analysis of the Journal of Chinese Language Teachers Association. The bibliometric study results over the past five decades on the evolution of Chinese language pedagogy. Further, Hammill (1990) attempted to identify learning disabilities during 1962to provides readers with a concise description of their current condition. Furthermore, Fernandez-Batanero et al. (2020) studyanalyses of co-words and clustering techniques are used through bibliometric maps to determine the scientific study fields. The study found that a medium-low impact index for published articles. The importance of using ICT from educational inclusion and accessibility with these students is related. Likewise, Stefanidis et al.(2018) study Investigate the bibliometric association and association of human brain entropies with learning difficulties and disabilities between electroencephalography (EEG). In the study, we use a Python tool programmable for observing bibliometric connections between EEG enterprises, learning difficulties and disabilities, and brain operation and signage. (Liu, 2013) study results showed that 1,636 papers were published in those journals during this five-year publication period. Around the same time, a total of 8,591 citations from websites were obtained for seven years. More than

100 citations were submitted to eight out of 17 journals. However, the number of citations received on the first Monday was the highest in D-Lib magazine was the average number of citations per article.

Jeyanthi et al.(2015)found that the maximum number of records (3606), followed by 2755 in 2012 and 2586 in 2011, were released in 2013. 87.4% of the journals, 1.25% of the news stories, 0.59% of the reviews, 0.45% of the news articles, and 0.24% of news articles. The US contributed to the most significant number of study documents.Dai et al. (2019)study focused on the 185/10,000 children from the Asian community in the Peninsula. Older mothers or fathers were substantially higher in ASD cases than in those without ASD than in premature births, preterm births, birth weights < 2 kg, infection during pregnancy, fetal therapy, perinatal asphyxia, jaundice pathology, hypoxic-ischemic encephalopathy, or gestational diabetes. The prevalence rates of ASD diagnoses between urban and rural areas were not substantially different.Moreover, the plurality of research publications originated in the USA (31.67 percent) and the most active institution was the University of Hong Kong. The latest coronavirus outbreak led to a large number of fatalities and forced the citizens of the Chinese Wuhan Province to stay confined at home. Virology is an area of CoViD-19 and the majority of papers are published in journals on virus science(Ram, 2020). Similarly, Sweileh et al.(2016) study highlight that most of these papers are published with 48,416 citations and an average citation of 23.59 citations per paper in the Journal of Autism and Developmental Disorders. The most frequently published countries included the United States (n = 198594; 46.48%), the UK (n = 2430, 13.14%) and Canada (n = 1077; 5.8%). 30.18 percent of the papers published by the top ten productive countries were produced internationally. In various publications and complete citations, King's College London (UK) placed first. US academics and research institutions dominated the top ten list of productive institutions.Also, Berk(1983) study aims to study and analyze toward and definition of learning disabilities progress or regress. Likewise, Zhu & Guan (2013)study goal was to conduct bibliometric research on creating service innovation based on complex network analysis. In the bibliographic area 'Title,' we searched related publications with the terms' service innovation' and 'new service development' and 437 papers after data cleaning. Four hundred thirty-seven papers have 381 keywords, 734 authors, and 48 categories after data normalization. Another study result shows that scientific papers were rocked over the last decade (2003-2012) every year. The USA is leading biofuels and partnering mainly with China, UK, Canada, and South Korea as other active countries. In general, more citations have been issued in international collaborative publications than in individual countries (Yaoyang & Boeing, 2013).Furthermore,Hussain& Fatima (2011) study analyzed that most of the publications were contributed by single authors. Bibliometric analyses were the technique used in this research, and it helps to analyze the bibliographic attributes during the five years 2006-2010 of papers published in the IFLA Journal.

Moreover, Zhang et al. (2017)study aims to provide insights into further studies in this area by thoroughly analyzing and delineating the history and status of digital innovation research.US displays a declining trend; its activity index (AI) and attractive index (AAI) scores have been lower than the world average since 2012. The study of the Co-Citation Network illustrates the evolution of this area of science. Likewise, Hussain & Fatima(2010)study found that 44 articles (70.97%) by academic/research institutes associated

authors. The year 2007 exhibited the maximum number of contributions to Chinese Librarianship: An International Electronic Journal.The purpose of the study conducted by Waheed et al. (2018)was to revealthe research was a bibliometric view of learning analytics' nature. Apparently, in 2011 the learning analysis field was instantiated; no substantial research activities can be foundedbefore this date. The temporal development suggests that students, teachers, higher education institutions, and the learning cycle seem to be critical elements in the area. The study of Traynor et al. (2001)attempts to linkthe numbers of funding sources per document and the numbers of authors per report. In articles concerned with theory and models, 'profession, technical problems,' and nurse education, the journal appreciation factor was strongest. It was noticed that foreign financing organizations were more likely to regard subjects as targets in operation. This bibliometric review has provided an overview of the UK nursing literature published. The effect of the current financial benefits for nursing study affecting Britain can be illustrated by a bibliometric review of a more recent treatment performance era.Similarly, Akhtar et al. (2011)data indicated that the authors contributed 139 papers 3 and 4 times. Eight hundred sixty-nine papers written in the Electronic Library Journal between 2000 and 2010 have contributed 1 and 2 times.Hussain et al. (2020) focused the study a bibliometric review for widely cited clinical findings of the 2009–2019 research period was the key objective of the study to assess Autism Spectrum Disorders (ASDs).

Furthermore, Li et al.(2018) study found that the first bibliometric analysis in the field of severe traumatic brain injury. On average, the top 100 articles were cited 326.4 times per paper. The Journal of Neurosurgery has published many of the top 100 papers (9 out of 100). American authors wrote the majority (67%) of the most cited articles. Likewise, Santhakumar et al.'s(2020)study found that the overall average for each paper was 10.89, and the university's h-index was 65 during the report. The university produces more documents in chemistry, and that researchers prefer to publish their research results in UK journals. More, Yadav et al.(2020)study show that the research result is an average of 18.93 articles annually. K. Sahoo is the most successful author, published 25 books. The state-of-the-art Science journal with 16 publications was the top ranking. The subject of biological science 54, and research article 230, a preferred analysis by Mizoram University scientists from 2004 to 2017, were published in the highest numbers. Finally,Gupta et al. (2011)study found that India ranks 12th out of the 20 top countries and has a world share in the publication (2.07%) that is higher than Brazil (1.74%) but lower than China (2.24%) and South Africa (2.52%). This study analyzed India's research performance in AIDS/HIV during 1999–2008. India's annual publication's average rise is above Brazil, but below China's and South African's. Yet India is less than other developing countries in the top 20 in international joint publications.

Purpose of the Present Study

In the present study, we examined patterns of responses for extracting the Web of Science database. We posed some important questions: (1) What are publishing trends in LD from 1970-2020? (2) What are the preferred journals of researchers? (3) What are the most productive countries, organizations, and authors? (4) What are the authorship and collaborative patterns of researchLD? And (5) What are frequently used keywords in LD?

Materials and Methods

A search was carried out in the Web of Science (WoS) database to get an overall picture of the learning disabilities publications. The query of Searching is TS= ("Learning disability" OR "learning disorder*" OR "learning difficulty" or "Learning difficulties" OR "Developmental, academic disorder" OR "Nonverbal learning disorder" OR "Developmental disorder of scholastic skills" OR "Knowledge acquisition disability" OR "Learning disability NOS" OR "Learning disorder NOS") dated 12 April 2020.

First search results: 9,610 carried out from Web of Science Core Collection. We searched for TS= ("Learning disability" OR "learning disorder*" OR "learning difficulty" or "Learning difficulties" OR "Developmental, academic disorder" OR "Nonverbal learning disorder" OR "Developmental disorder of scholastic skills" OR "Knowledge acquisition disability" OR "Learning disability NOS" OR "Learning disorder NOS"). DOCUMENT TYPES refined us: (ARTICLE OR EDITORIAL MATERIAL OR PROCEEDINGS PAPER OR REVIEW OR BOOK REVIEW OR BOOK CHAPTER) AND [excluding] DOCUMENT TYPES: (BOOK REVIEW OR EARLY ACCESS OR DATA PAPER OR RETRACTED PUBLICATION). Timespan: 1970-2020. Indexes: SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI, CCR-EXPANDED, IC.

We were refined Results: 9,530 from WoS database core collection. We searched for TS= ("Learning disability" OR "learning disorder*" OR "learning difficulty" or "Learning difficulties" OR "Developmental, academic disorder" OR "Nonverbal learning disorder" OR "Developmental disorder of scholastic skills" OR "Knowledge acquisition disability" OR "Learning disability NOS" OR "Learning disorder NOS"). DOCUMENT TYPES refined us: (ARTICLE OR EDITORIAL MATERIAL OR PROCEEDINGS PAPER OR REVIEW OR BOOK REVIEW OR BOOK CHAPTER) AND [excluding] DOCUMENT TYPES: (BOOK REVIEW OR EARLY ACCESS OR DATA PAPER OR RETRACTED PUBLICATION) AND PUBLICATION YEARS: (2020 OR 2002 OR 1984 OR 2019 OR 2001 OR 1983 OR 2018 OR 2000 OR 1982 OR 2017 OR 1999 OR 1981 OR 2016 OR 1998 OR 1980 OR 2015 OR 1997 OR 1979 OR 2014 OR 1996 OR 1978 OR 2013 OR 1995 OR 1977 OR 2012 OR 1994 OR 1976 OR 2011 OR 1993 OR 1975 OR 2010 OR 1992 OR 1974 OR 2009 OR 1991 OR 1973 OR 2008 OR 1990 OR 1972 OR 2007 OR 1989 OR 1971 OR 2006 OR 1988 OR 1970 OR 2005 OR 1987 OR 2004 OR 1986 OR 2003 OR 1985).

Though we downloaded 9526 records, the number of files might change since, by the time more articles are published. All document types: Article (7619) was the most frequent form of publication, followed by Proceeding paper (765), Review (659), Editorial material (250); Article; Proceedings Paper (217), Article; Book Chapter was contributing (2). And review; Book chapter (14) was selected.

Bibliometric tools such as Biblioshiny, ScientoPy, HistCite, BibExcel, and VOSViewer have been used to perform bibliometric analysis and build data matrixes for co-citation, coupling, scientific collaboration analysis, and co-word analysis.

Results

Year-wise distribution

Table & Figure 1 show the distribution of research articles on learning disabilities published in journals from 1970-2020. A total of 9526 research articles was published during

this period of these years. Out of 2547 articles, the highest number of research articles (TP = 2647) was published in the year 2016-2020, followed by 2011-2015 with 2309 Table 1 and Figure 1 shows the distribution of research articles on learning disabilities published in journals during the period 1970-2020.articles were published in the year 1976-1980 with 82 articles. The Total Global Citation Sources (49465) was highest in 2006-2010, followed by Total Global Citation Sources (44657) higher in the year 2001-2005. They were further followed by TC (36412) in the year 1996-2000.

Table 1.Year-wise distribution

Year	TP	TC
1970-1975	96	866
1976-1980	82	705
1981-1985	123	2151
1986-1990	115	1828
1991-1995	527	16484
1996-2000	965	36412
2001-2005	1069	44657
2006-2010	1597	49465
2011-2015	2309	34457
2016-2020	2647	8549

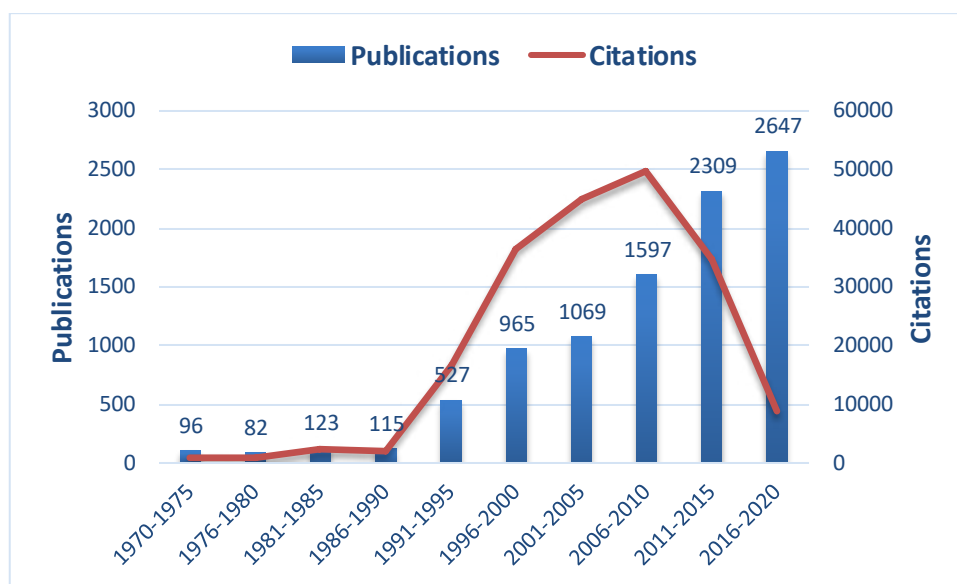*Note.*TP= Total Publication, TC= Total Citation

Fig. 1.Year-wise distributiondocument types

Document types

Table 2 shows that a total of 9526 documents met the selection criteria. Seven document types were found in these 9526 publications, article (7619) was the most frequent form of publication, followed by Proceeding paper (765), Review (659), Editorial material (250); Article; Proceedings Paper (217), Article; Book Chapter was contributing (14). And review; Book chapter (14). The most frequent documents like the article were Web of Science core collection total citation (161897) with Z9 (165926). Usage count (Last 180 Days) (4835), Total usage count (Since 2013) (77227).

Table 2: Documents type

DT	TP	Z9	TC	U1	U2
Article	7619	165926	161897	4835	77227
Proceedings paper	765	1528	1475	225	1996
Review	659	24124	23397	623	11593
Editorial material	250	1291	1270	47	1180
Article; Proceedings paper	217	7626	7443	54	1565
Article; Book chapter	14	43	42	19	70
Review; Book chapter	2	28	28	9	53

Note. DT= Documents type, TP=Total Publication, Z9=Total Times Cited Count, TC=Total Citation, U1= Usage Count (Last 180 Days), U2= Usage Count (Since 2013)

Source-wise

Source-wise distribution, as presented in Table 3. Journal of Learning Disabilities (IF_{2018}=2.341) published the highest number of articles (282) on LD with Z9 is 8338, TU1 is 186, TU2 is 3142, and the highest number of citations is 8173, followed by the Journal of Intellectual Disability Research (IF=1.941) with a total article published 187, the total citation is 5961, Z9 is 6010, U1 is 69, U2 is 2353. The third most productive publication source was the British Journal of Learning Disabilities (IF_{2018}=0.5) with 184 articles and total citation 863, Z9 is 868, U1 is 92, and U2 is 2115. Disability & Society (IF=1.613) published a total of articles 173 (with Z9=3475, U1=34, U2=1199 with a total citation is 3463. There were small numbers of articles published American Journal of Medical Genetics Part A(IF=2.197) with 92 articles, Z9 is 1992, U1 is 17, U2 is 378 with 1863 citations; furthermore, Tizard Learning Disability Review is 79, Z9 is 79, U1 is 33, U2 is 276 with 79 citations.

Table 3:Source-wise distribution

Name of Journal	Publisher	Country	TP.	Z9	TC.	U1	U2	IF_{2018}
Journal of Learning Disabilities	SAGE Publications	USA	282	8338	8173	186	3142	2.341

Journal of Intellectual Disability Research	Blackwell Publishing Inc.	UK	187	6010	5961	69	2353	1.941
British Journal of Learning Disabilities	Blackwell Publishing Inc.	UK	184	868	863	92	2115	0.5
Disability & Society	Carfax Publishing Ltd.	UK	173	3475	3463	34	1199	1.613
Developmental Medicine and Child Neurology	Wiley-Blackwell	USA	137	5964	5777	30	915	3.532
Journal of Applied Research in Intellectual Disabilities	Blackwell Publishing Inc.	UK	122	2141	2127	73	1384	1.769
Research in Developmental Disabilities	Elsevier Ltd.	UK	113	2397	2360	127	2423	1.872
Learning Disability Quarterly	SAGE Publications	USA	101	1352	1340	45	793	1.525
American Journal of Medical Genetics Part A	Wiley-Liss Inc	USA	92	1952	1863	17	378	2.197
Tizard Learning Disability Review	Emerald Group Publishing Ltd.	UK	79	79	79	33	276	N/A

Note. TP=Total Publication, Z9=Total Times Cited Count, TC=Total Citation, U1= Usage Count (Last 180 Days), U2=Usage Count (Since 2013), IF=Impact Factor

Top publisher

The top publisher presented in Table 4, Wiley, published the highest number of articles (829) on LD with Z9 is 15905, U1 is 713, U2 is 10199, and the highest number of citations are 15493 in the USA, followed by Routledge Journals, Taylor & Francis Ltd with a total published article of 520, the total number of citations is 6263, Z9 is 6360, U1 is 460, U2 is 6903 in the UK. With its 480 papers and complete citation, the third-most active publisher Sage Publications Inc. (the USA is 10308, 10496 is Z9, 465 is TU1, 7134 is TU2). The 130 papers of Elsevier Science (USA) are 4007, 4124 are Z9, 80 U1, and 2076 are U2, and U2 is 4007.

Table 4: Top publisher

PU	Country	TP	Z9	TC	U1	U2
Wiley	USA	829	15905	15493	713	10199

Routledge Journals, Taylor & Francis Ltd	UK	520	6360	6263	460	6903
Sage Publications Inc	USA	480	10496	10308	465	7134
Pergamon-Elsevier Science Ltd	UK	325	9185	8973	298	5682
Wiley-Blackwell	USA	295	5633	5491	123	3901
Elsevier Science BV	Netherlands	261	4828	4662	116	2443
Springer	Germany	241	3283	3191	180	3133
Lippincott Williams & Wilkins	USA	222	5634	5449	128	2139
Emerald Group Publishing Ltd	UK	184	222	221	108	698
Pro-Ed Inc	USA	171	4068	3992	26	702
Cambridge University Press	UK	165	7266	7148	76	1575
Elsevier Science Inc	Netherlands	154	8061	7825	159	2741
Sage Publications Ltd	USA	138	1905	1878	83	1493
IEEE	USA	133	150	149	55	247
Academic Press Inc Elsevier Science	USA	130	4124	4007	80	2076

Note. PU=Publication Type, TP=Total Publication, Z9=Total Times Cited Count, TC=Total Citation, U1= Usage Count (Last 180 Days), U2= Usage Count (Since 2013)

Top cities-wise productive authors

The cities with the greatest contribution to the field of LD over 15 years are presented in Table 5. Cities of affiliation of authors are used to establish the sources of papers, and the first author's contributions are known to be the key author (Ho, 2014; Riesenberg et al., 1990). Hoboken in the USA was the most productive city, with 1,047 articles, followed by New York in the USA (875) and Oxford in the UK (798) ranked 1-3. In addition to London in the UK (798), Abingdon in the UK (671), Thousand Oaks in the USA (479), Philadelphia in the USA (354), Amsterdam in the Netherlands (338), the number of publications ranked among the top 15 cities. The authors from New York City in the USA had the highest number of citations (about 27072), followed by Oxford,which had the second-highest number of citations (22614). Further, Hoboken had the third-highest number of citations (20306) ranked among the top 15 cities. Nevertheless, the highest usage count (U1 = 814; U2 = 13184), followed up by Oxford (U1 = 597; U2 = 9953); and New York (U1 = 583; U2 = 9227) in Hoboken City is the highest usage count (last 180 days) and usage count (since 2013).

Table 5: Top cities-wise productive authors

PI (Cities)	Country	TP.	Z9	TC.	U1	U2 (Since 2013)

Hoboken	USA	1047	20848	20306	814	13184
New York	USA	875	27761	27071	583	9227
Oxford	UK	798	23094	22614	597	9953
London	UK	701	18618	18164	430	5977
Abingdon	UK	671	8972	8834	526	8107
Thousand Oaks	USA	479	10490	10302	465	7130
Philadelphia	USA	354	8590	8320	175	3339
Amsterdam	Netherlands	338	5838	5632	194	3224
Washington	USA	193	11766	11485	183	3412
Bingley	UK	185	259	257	110	733
Austin	USA	173	4069	3993	26	703
San Diego	USA	158	5931	5762	91	2328
Malden	USA	149	4535	4432	55	1913
Valencia	Spain	113	9	9	43	297
Barcelona	Spain	81	310	276	23	546

Note. PI=Publisher City, TP=Total Publication, Z9=Total Times Cited Count, TC=Total Citation, U1=Usage Count (Last 180 Days), U2=Usage Count (Since 2013)

Top documents

The top documents presented in Table 6 shows that the top paper received the highest total number of times cited (Z9 = 1113) were *Domorbidity of attention-deficit hyperactivity disorder with conduct, depressive, anxiety, and other disorders* by Biederman J; Newcorn J; Sprich S, published (SO) by American Journal of Psychiatry with the science core collection times cited count (TC = 1099), usage count (Last 180 Days) is (U1 = 5), usage count (since 2013) is (U2 = 259). The second-highest total times cited count (Z9 = 875) was *Prader-Willi syndrome - consensus diagnostic-criteria* by Holm VA; Cassidy SB; Butler MG; Hanchett JM; Greenswag LR; Whitman BY; Greenberg F, published in Pediatrics journal with TC = 833, U1 = 3 and U2 = 53. The third-highest total times cited count (Z9 = 814) was *Left-handedness - association with immune disease, migraine, and developmental learning disorde*r by Geschwind N; Behan P, published in Proceedings of the National Academy of Sciences of the United States of America-Biological Sciences with TC = 809, U1 = 0 and U2 = 40.

The most usage count article (last 180 days) was *Trends in the prevalence of developmental disabilities in USchildren, 1997-2008* and was authored by Boyle CA; Boulet S; Schieve LA; Cohen RA; Blumberg SJ; Yeargin-Allsopp M; Nogle Visser S; Kogan MD, that is, (U1 = 7). The small numbers of documents received the total times cited count (Z9 = 547) was the *relationship between concussion and neuropsychological performance in college football players* by Collins MW; Grindel SH; Lovell MR; Dede DE; Moser DJ;

Phalin BR; S; Wasik M; Cordry D; Daugherty MK; Sears SF; Nicolette G; Indelicato P; Mckeag DB and published Jama-Journal of the American Medical Association.

Table 6: Top documents

TI	AU	SO	Z9	TC	U1	U2
Comorbidity of attention-deficit hyperactivity disorder with conduct, depressive, anxiety, and other disorders	Biederman J; Newcorn J; Sprich S	American Journal of Psychiatry	1113	1099	5	259
Prader-Willi syndrome - consensus diagnostic-criteria	Holm VA; Cassidy SB; Butler MG; Hanchett Jm; Greenswag LR; Whitman BY; Greenberg F	Pediatrics	875	833	3	53
Left-handedness - association with immune disease, migraine, and developmental learning disorder	Geschwind N; Behan P	Proceedings of The National Academy of Sciences of The United States of America-Biological Sciences	814	809	0	40
Trends in the prevalence of developmental disabilities in us children, 1997-2008	Boyle CA; Boulet S; Schieve LA; Cohen RA; Blumberg SJ; Yeargin-Allsopp M; Visser S; Kogan MD	Pediatrics	796	789	7	141
In vivo evidence that erythropoietin protects neurons from ischemic damage	Sakanaka M; Wen TC; Matsuda S; Masuda S; Morishita E; Nagao M; Sasaki R	Proceedings of The National Academy of Sciences of The United States of America	812	760	0	26
High rates of	Murphy KC;	Archives of	743	725	3	26

schizophrenia in adults with Velo-cardio-facial syndrome	Jones LA; Owen MJ	General Psychiatry				
a meta-analysis of working memory impairments in children with attention-deficit/hyperactivity disorder	Martinussen R; Hayden J; Hogg-Johnson S; Tannock R	Journal of The American Academy of Child and Adolescent Psychiatry	723	704	5	184
Relationship between concussion and neuropsychological performance in college football players	Collins MW; Grindel SH; Lovell MR; Dede DE; Moser DJ; Phalin BR; Nogle S; Wasik M; Cordry D; Daugherty MK; Sears SF; Nicolette G; Indelicato P; Mckeag DB	Jama-Journal of The American Medical Association	547	542	0	75
clinical practice guideline - care of girls and women with Turner syndrome: a guideline of the turner syndrome study group	Bondy CA	Journal of Clinical Endocrinology & Metabolism	555	516	3	48
Mathematics and learning disabilities	Geary DC	Journal of Learning Disabilities	519	502	6	108

Note. TI=Document Title, AU=Authors, SO=Publication Name, Z9=Total Times Cited Count, TC=Total Citation, U1=Usage Count (Last 180 Days), U2=Usage Count (Since 2013)

Productive authors

The productive author presented the following in Table 7. Gillberg C (Affiliation: Karolinska Institute, Country: Sweden) was the most productive author to publish 35 articles, followed by Cornoldi C (University of Padua, Italy), the second most productive author to publish 29 articles, and Geary DC (Vanderbilt University, USA) the third most productive author to publish 27 articles. Cited Count Effect, Geary DC ranked first with 3309 quotations, followed by Gillberg C (2357 quotations) and Mazzoccos MMM (1130).

On the author's main quality parameters, i.e., h index and g_index, Gillberg C. ranked first with h_index value 24 and a g_index value is 35. Geary DC ranked second with h_index

value 23 and g_index value 27, Fuchs LS ranked third with h_index value 17, and g_index value 23.

Table 7: Top productive authors

Author	Affiliation	Country	h_index	g_index	TC	TP
Gillberg C	Karolinska Institute	Sweden	24	35	2357	35
Cornoldi C	University of Padua	Italy	14	24	594	29
Geary DC	Vanderbilt University	USA	23	27	3309	27
Fuchs LS	Florida State University	USA	17	25	1194	25
Mazzocco MMM	Johns Hopkins University	UK	16	25	1330	25
Fuchs D	Vanderbilt University	USA	15	23	1026	23
Kerr M	Cardiff University	USA	12	23	573	23
Mckenzie K	Northumbria University	UK	10	15	240	22
Bhaumik S	University of Leicester	UK	8	19	392	21
Hassiotis A	Camden and Islington NHS Foundation Trust	UK	9	19	388	21

Note. TC=Total Citation, TP=Total Publication

Author's publications

The author's publication, illustrated in Figure 2, showed the authorship of the articles' publications. Source-wise distribution, as presented in Table 3. Two authors contributed 2189 articles, while three authors contributed (1847) articles. It is followed by a single author (1747), four authors (1240), five authors (805), six authors (543), and seven authors (351) articles. It was followed by eight authors (202), nine authors (164), ten authors (109), 11 authors (62), 12 authors (46), 13 authors (38) and 14 authors (36), 15 authors (34), 16 authors (19), 18 authors (12), 17 authors and 19 authors (11).21 and 22 authors (7) and 20 and 24 authors (6), 26 authors (5), 27, 32 and 36 authors contributed (3), 23, 25, 28, 29, 30, and 59 authors contributed (2) articles. In addition, 31,33,35,45,56,58,68,69,70,71,74 and 214 authors contributed a single article.
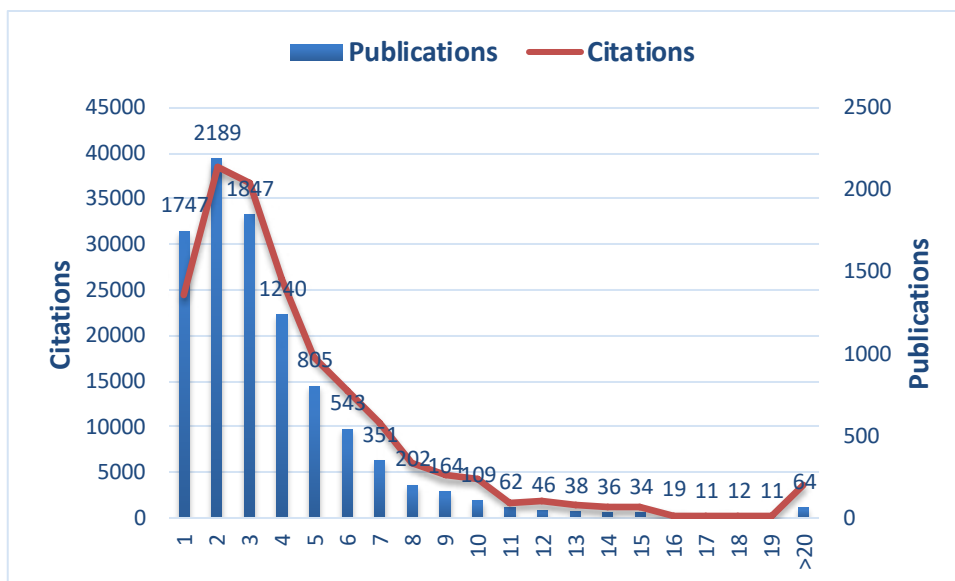
Fig.2.Authors publications

Co-occurrence author keywords

Co-occurrence of author keywords Figures3 selected Co-occurrence from analysis types and author keywords from the analysis unit—selected criteria for the full method of counting. The minimum number of author keywords selected was 25. There was a total of 15382 author keywords, and 88 sources met the thresholds. The total strength of the co-occurrence links with other keywords wascalculated for each of the 88 sources. The keywords of the authors with the greatest total link strength were selected. The total number was 88, cluster 7, links 1240 and the total link strength was 3300.
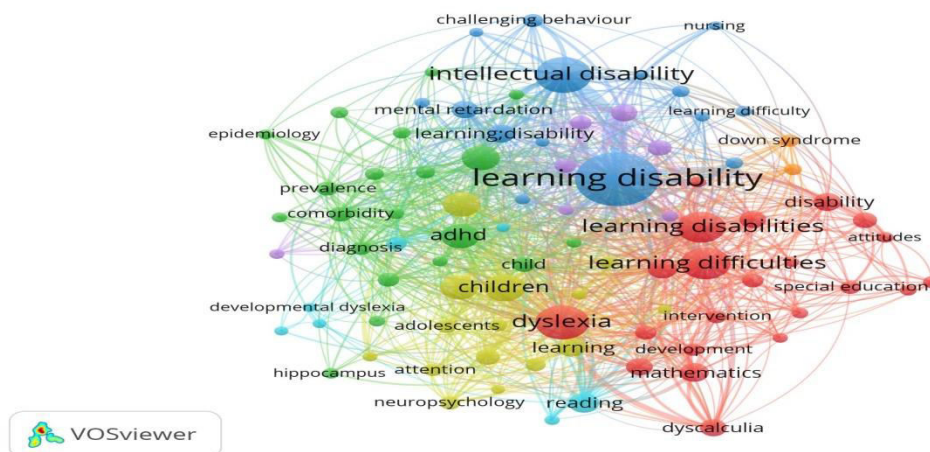
Fig.3.Co-occurrence author keywords

Co-authorship with authors: visualization of density

Co-authorship with authors' density visualization is shown in Figure 4. Selected co-authors of the analysis type and authors of the analysis unit. The selected full method of counting the criteria of the method. The minimum number of authors' chosen documents was 4. A total of 8491 sources were identified, and 79 authors met the thresholds. The total strength of the co-authorship links with other authors wascalculated for each of the 79

authors. The authors with the highest overall link strengthswere selected. The total itemswere79; cluster 79, link 0, and total link strengths were 0.
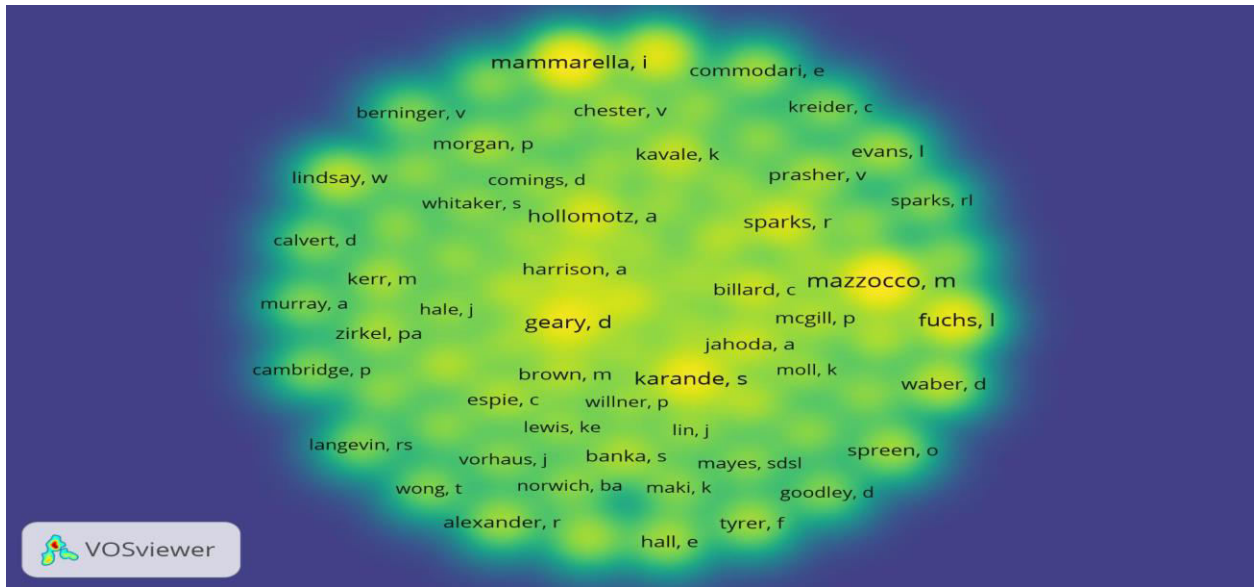

Fig.4.Co-authorship with authors: visualization of density

Co-authority with the organization

Co-authority with the organization in Figure 5. Selected Co-authors from analysis types and organizations from the analysis unit. The selected full method of counting the criteria of the method. The minimum number of documents of the organizations chosen was 25. A total of 6521 organizations and 92 organizations met the thresholds. The total strengths of the co-authorship links with other organizations were calculated for each of the 92 organizations. Organizations with the highest overall link strengths have been selected. The total item was 79, cluster 6, links 643, and total link strength was 1132.
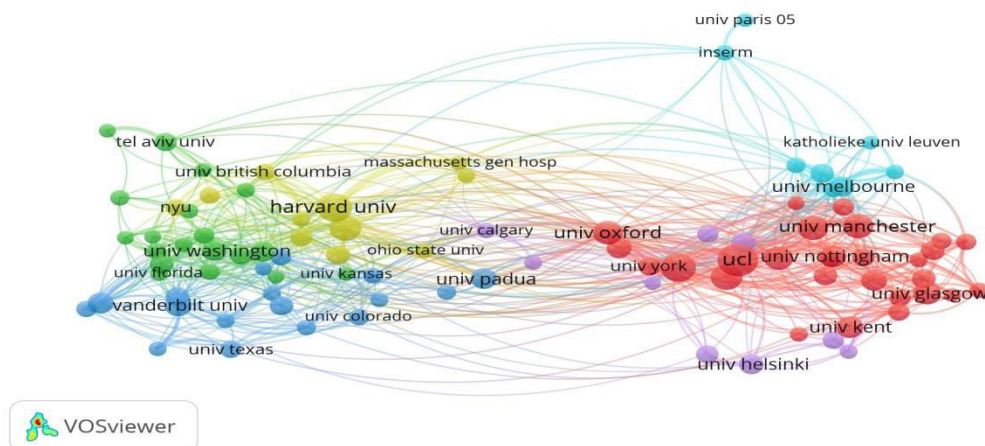

Figure 5. Co-authority with the organization

Discussion

Therefore, this paper offers a comprehensive bibliometric analysis of research LD in a broad spectrum across the landscape of science and social science through various bibliometric approaches, including descriptive analysis, network analysis, and constructing and visualizing bibliometric networks. The results show that out of 9526 articles published in the Year of Wise Distribution, the highest number of research articles was published in 2016-2020 with 2647 research articles. Total Global Citation Sources (49465) was the highest in the years 2006-2010. Article type document constitutes 7619 records among the different types of documents; WoS database core collection's total citations are161897 with Z9 (165926). Usage count (Last 180 Days) (4835), user count (Since 2013) (77227). Journal of Learning Disabilities (IF$_{2018}$=2.341) published the highest number of articles (282) on the LD, with Z9 being 8338, U1 being 186, U2 being 3142, and the highest number of citations being 8173. Wiley's top publisher distributed the highest number of articles (829) on LD with Z9 is 15905, U1 is 713, U2 is 10199, and the most impressive number of citations the USA is 15493.

The USA's most productive city was Hoboken, with 1,047 articles, followed by New York in the USA (875), and Oxford in the UK (798) ranked 1-3. The top documents received by the highest total number of times cited count (Z9 = 1113) were 'Comorbidity of attention-deficit hyperactivity disorder with behavioral, depressive, anxiety, and other disorders' by Biederman J; Newcorn J; Sprich S, published by the American Journal of Psychiatry with the science core collection times cited (TC = 1099), usage count (Last 180 Days) is (U1 = 5), usage count (since 2013) is (U2 = 259). The most productive author to publish 35 articles was Gillberg C (Karolinska Institute, Sweden). In this paper, it was noted that two authors contributed 2189 articles. In Author keywords, the minimum number of author keywords selected was 25. There was a total of 15382 author keywords, and 88 sources met the thresholds. The selected minimum number of documents of authors was 4. A total of 8491 sources were identified, and 79 authors met the thresholds. The total strength of the co-authorship links with other authors was calculated for each of the 79 authors.

Conclusion

This study presents the findings of exploring learning Analytics, as reflected in the published research. The goal of this research was to perform a quantitative analysis in the LD area between 1970 and 2020 using bibliometric methods. Generally, this study's results have shown that the proportion of learning disabilities is on the rise. Furthermore, research on LD can be done in a more specific area in the future. It must be undertaken on the various academic backgrounds of bibliometric researchers. This would contribute to a better understanding of LDs for researchers in different disciplines (Vijayalakshmi & Swaminathan, 2017).

Declaration of Conflicting Interests

The author(s) did not declare any potential conflicts of interest concerning the research, authorship, and publication of this article.

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